

# **CALIFORNIA 2013 BUILDING CODE**

**California Code of Regulations  
Title 24, Part 2, Volume 1 of 2**

Based on the 2012 International Building Code®

**California Building Standards Commission**



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2013 California Building Code  
California Code of Regulations, Title 24, Volume 1 of Part 2

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## PREFACE

This document is Part 2 of 12 parts of the official triennial compilation and publication of the adoptions, amendments and repeal of administrative regulations to *California Code of Regulations, Title 24*, also referred to as the *California Building Standards Code*. This part is known as the *California Building Code*.

The *California Building Standards Code* is published in its entirety every three years by order of the California legislature, with supplements published in intervening years. The California legislature delegated authority to various state agencies, boards, commissions and departments to create building regulations to implement the state's statutes. These building regulations, or standards, have the same force of law, and take effect 180 days after their publication unless otherwise stipulated. The *California Building Standards Code* applies to occupancies in the State of California as annotated.

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Should you find publication (e.g., typographical) errors or inconsistencies in this code or wish to offer comments toward improving its format, please address your comments to:

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This collaborative effort included the assistance of the Commission's Code Advisory Committees and many other volunteers who worked tirelessly to assist the Commission in the production of this Code.

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# CALIFORNIA CODE OF REGULATIONS, TITLE 24

## California Agency Information Contact List

### Board of State and Community Corrections

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### California Building Standards Commission

www.bsc.ca.gov ..... (916) 263 0916

### California Energy Commission

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Symbols in the margin indicate the status of code changes as follows:

- || This symbol indicates that a change has been made to a California amendment.
- > This symbol indicates deletion of California amendment language.
- | This symbol indicates that a change has been made to International Code Council model language.
- ➡ This symbol indicates deletion of International Code Council model language.

A single asterisk [\*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk [\*\*] placed in the margin indicates that the text or table immediately following it has been relocated there from elsewhere in the code. The following table indicates such relocations in the 2012 edition of the *International Building Code*.

2012 LOCATION	2009 LOCATION
407.4	1014.2
410.6	1015.6
424	402.6.3
712.1	708.1
712.1.2	708.2, Exception 1
712.1.3	708.2, Exception 2
712.1.3.1	708.2, Exception 2.1
712.1.3.2	708.2, Exception 2.2
712.1.4	708.2, Exception 3
712.1.5	708.2, Exception 4
712.1.6	708.2, Exception 5
712.1.7	708.2, Exception 6
712.1.8	708.2, Exception 7
712.1.9	708.2, Exception 8
712.1.10	708.2, Exception 9
712.1.11	708.2, Exception 10
712.1.12	708.2, Exception 11
712.1.13	708.2, Exception 12
712.1.14	708.2, Exception 13
712.1.15	708.2, Exception 14
712.1.16	708.2, Exception 15
712.1.18	708.2, Exception 16
713.3 through 713.14.1.1	708.3 through 708.14.1.1
909.21 through 909.21.11	708.14.2 through 708.14.2.11
1004.1.1.2	1004.6
1008.1.9.8	1008.1.4.4
1013.8	1405.13.2
1028.10.1	1017.4
<i>continued</i>	

2012 LOCATION	2009 LOCATION
1028.10.1.1	1017.4.1
1028.10.1.1	1017.4.2
1028.10.1.2	1017.4.3
1210.3.1	2903.1
1210.3.2	2903.2
1406.2.1	1406.2.1.1
1406.2.2	1406.2.1
1607.6	1605.4
1704.3	1705.1
1704.4	1709.1
1704.5	1710.1
1705.1.1	1704.15
1705.4.2	1704.11
1705.10	1706.1
1705.11	1707.1
1705.12	1708.1
3313.1	3311.4

## Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers)

In each code development cycle, proposed changes to the code are considered at the Code Development Hearings by the applicable International Building Code Development Committee (IBC-Fire Safety, General, Means of Egress or Structural). Proposed changes to a code section that has a number beginning with a letter in brackets are considered by a different code development committee. For example, proposed changes to code sections that have [F] in front of them (e.g., [F] 903.1.1.1) are considered by the International Fire Code Development Committee during the portion of the code development hearings when the International Fire Code Development Committee meets.

The content of sections in this code that begin with a letter designation is maintained by another code development committee in accordance with the following:

- [A] = Administrative Code Development Committee;
- [E] = International Energy Conservation Code Development Committee (Commercial Energy Committee or Residential Energy Committee, as applicable);
- [EB] = International Existing Building Code Development Committee;
- [F] = International Fire Code Development Committee;
- [FG] = International Fuel Gas Code Development Committee;
- [M] = International Mechanical Code Development Committee; and
- [P] = International Plumbing Code Development Committee.

# EFFECTIVE USE OF THE IBC/CBC

Distilling the code review process down to a methodical, sequential list of considerations is generally problematic. In many cases, related provisions from various chapters of the code must be considered simultaneously, or reconsidered later in the process to arrive at the correct classification or determination. Any number of acceptable alternatives may exist for construction of the building and its specific features. Each choice provided by the code must be evaluated for its specific impact on other aspects of the building's analysis. With a basic understanding of the interrelationship of the various chapters, the practiced code user will make an initial assessment of the building as a first step of the code review process. The following outline may be helpful as a guide for the effective use of the IBC, with the understanding that final resolution of each step is often dependant on subsequent steps.

The following process begins with a brief discussion of the key administrative areas of the code. The process addressing technical provisions is divided into two distinct areas of analysis, the nonstructural provisions of the IBC and the structural provisions. Although reference is not made to all provisions set forth in the IBC, the process is intended to be representative of an approach to using the IBC in an effective manner.

## Administrative Provisions

Prior to any analysis based on the technical provisions of the IBC, it is important that the fundamental administrative aspects of the code be reviewed. It is critical that the basis of technical decisions be consistent with the approach established in IBC Chapter 1, including:

- Scope of the IBC
- Intent of the IBC
- Applicability of the IBC
- Duties and powers of the building official
- Alternate materials, designs and methods of construction

## Nonstructural Provisions

**1. Classify the building for occupancy and construction type.** The first step in analyzing a building for code compliance is its proper classification based on anticipated use(s) and construction features.

**Identify the distinct and varied uses of the building.** The uses that will occur within the building must be identified, evaluated and classified into one or more of the distinct occupancy classifications established in the IBC. Some buildings will be classified as single-occupancy, where there is only one applicable occupancy classification. Others will be considered as mixed-occupancy due to the presence of two or more uses that are classified into different occupancy groups.

**Sec. 302.1 Classify the building into one or more occupancy groups.** Although there are 10 general occupancy groups, many of the groups are subdivided into sub-groups to allow for a more exacting analysis of the building under consideration.

Sec. 303	Group A
Sec. 304	Group B
Sec. 305	Group E
Sec. 306	Group F
Sec. 307	Group H
Sec. 308	Group I
Sec. 309	Group M
Sec. 310	Group R
Sec. 311	Group S
Sec. 312	Group U

**Identify the building's type of construction based on the materials of construction and degree of fire-resistance for the building's major elements.** The primary structural frame, exterior walls, interior walls, floor construction and roof construction, as applicable, must be evaluated in regard to their degree of fire-resistance and materials of construction in order to classify the building based upon type of construction.

**Sec. 602.1 Classify the building into a single type of construction.** Five general types of construction have been established and further subdivided into nine specific construction types. The classification of construction type is based on a combination of the degree of fire-resistance and the type of materials of the key building elements.

- Sec. 602 Type of construction based on materials of construction
- Table 601 Type of construction based on fire rating of the building elements
- Sec. 603 Combustible materials in Type I and II buildings

**Sec. 1505 Verify classification of roof covering.** Roof coverings are typically required to provide protection against moderate or light fire exposures from the exterior. Their minimum required classification is based upon the type of construction of the building.

**2. Determine if the building is to be fully sprinklered.** Many of the code provisions vary based upon the presence of an automatic sprinkler system throughout, or in specific portions of, the building.

**Sec. 903.2 Determine if the building requires a fire sprinkler system.** Many of the mandates for the installation of a sprinkler system are based upon the occupancy or occupancies that occur within the building. The provisions will often require some degree of occupant load and fire area determination. Other conditions may also trigger a required sprinkler installation, such as building height or the lack of exterior openings.

**If a sprinkler system is not required, review for potential code modifications if a sprinkler system is installed.** There are a significant number of benefits provided by the code if a sprinkler system is installed. An initial analysis of the building will typically allow for an early determination of the value of such sprinkler benefits, including:

- Sec. 504.2 Story and height increase (reduced type of construction)
- Sec. 506.3 Allowable area increase (reduced type of construction)
- Sec. 507.3 Unlimited area building (reduced type of construction)
- Sec. 1018.1 Elimination of corridor fire-resistance rating

**3. Locate the building on the site.** The location of the building(s) on the lot is fundamental to the degree of fire exposure to and from adjoining buildings and lots. In addition, the building's location influences the amount of fire department access that can be provided from the exterior of the building.

**Sec. 503.1.2 Determine the number of buildings on the site.** Where two or more buildings are located on the same lot, they can be evaluated as a single building or multiple buildings. The type of construction requirements may differ based upon which of the two methods is utilized.

**Sec. 602.1 Determine minimum required fire rating of exterior walls.** The fire separation distance is the measurement used in evaluating the necessary fire rating for exterior walls. It is measured from the building to the lot line, to the center line of a public way, or to an imaginary assumed line between two buildings on the same lot. Projections and parapets, if applicable, are also regulated.

**Sec. 704.8 Determine exterior opening protection requirements.** Openings in exterior walls are regulated by the fire separation distance and the rating of the exterior wall in which they are located.

**Sec. 506.2 Determine frontage increase for allowable area purposes.** Utilized primarily for fire department access, open space adjacent to a building's perimeter provides for an increase in the allowable area.

**4. Verify building's construction type by determining the allowable building size.** The permitted types of construction are primarily based upon the occupancy classifications involved, the building's height and the building's floor area. Other conditions may also affect the appropriate construction types, including the building's location on the lot and the intended materials of construction. In buildings with mixed-occupancy conditions, the methods of addressing the relationship between the multiple occupancies indirectly affect construction type.

**Sec. 202 and 502 Calculate actual height of building in both 'feet' and 'stories above grade plane'.** The code specifically describes the method for assigning a building height, measure both in the number of feet and the number of stories above grade plane. The actual height must be compared with the allowable height to determine if the building's type of construction is acceptable.

**Sec. 504 Determine allowable height permitted for 'feet' and 'stories'**

**Sec. 505 Determine if mezzanine provisions are applicable**

**Sec. 504.3 Determine if any rooftop structures are in compliance**

**Sec. 502 Calculate actual floor area of each story of building.** The building area is typically the entire floor area that occurs within the surrounding exterior walls. The building area for each individual story must be calculated, as well as for the building as a whole.

**Sec. 507 Determine if building qualifies as an unlimited area building****Sec. 506. Determine allowable area permitted for each story and building as a whole if: -**

- Sec. 506 Single-occupancy building
- Sec. 508.2 Multi-occupancy w/accessory occupancies
- Sec. 508.3 Multi-occupancy building w/nonseparated occupancies
- Sec. 508.4 Multi-occupancy building w/separated occupancies
- Sec. 706.1 Use of fire walls

**Sec. 509 Determine if special provisions are to be applied for height and/or area.** The general requirements for allowable height and area may be modified under limited conditions, typically where a parking garage is located in a building with other occupancies.

**5. Identify extent of any special detailed occupancy requirements.** Special types of buildings, special uses that occur within buildings, and special elements of a building are further regulated through specific requirements found in Chapter 4. Since these provisions are specific in nature, they apply in lieu of the general requirements found elsewhere in the code.

**Chapter 4. Determine special detailed requirements based on occupancy.** A number of the special provisions are applicable to a specific occupancy or group of similar occupancies.

- Sec. 402 Covered mall buildings
- Sec. 403 High-rise buildings
- Sec. 404 Atriums
- Sec. 405 Underground buildings
- Sec. 406 Motor-vehicle-related occupancies
- Sec. 407 Group I-2 occupancies
- Sec. 408 Group I-3 occupancies
- Sec. 411 Special amusement buildings
- Sec. 412 Aircraft-related occupancies
- Sec. 415 Group H occupancies
- Sec. 419 Live/work units
- Sec. 420 Groups I-1, R-1, R-2 and R-3
- Sec. 422 Ambulatory health care facilities

**Table 508.2.5 Determine if building contains any incidental accessory occupancies.** The uses identified in Table 508.5.2 are considered as a portion of the occupancy in which they are located, but special conditions required that they be addressed in a more specific manner.

Sec. 508.2.5 Provide fire separation and/or fire-extinguishing system

**6. Identify and evaluate fire and smoke protective elements.** Where fire-resistance-rated construction and/or smoke protection is mandated by other provisions of the code, the provisions of Chapter 7 identify the appropriate methods for gaining compliance.

**Chapter 7. Verify compliance w/details of fire and smoke resistance.** The various elements of fire-resistance-rated and smoke-resistant construction are detailed, including walls, horizontal assemblies, shaft enclosures, including openings such as doors and windows, as well as the penetration of such elements by conduit, ducts, piping and other items.

- Sec. 704 Structural members
- Sec. 707 Fire barriers
- Sec. 709 Fire partitions
- Sec. 710 Smoke barriers
- Sec. 711 Smoke partitions
- Sec. 712 Horizontal assemblies
- Sec. 708 Shaft enclosures
- Sec. 713 Penetrations
- Sec. 714 Joint systems
- Sec. 715 Opening protectives
- Sec. 716 Ducts and air transfer openings

**7. Identify additional fire protection systems that may be required.** In addition to automatic sprinkler systems, there are several other types of fire protection systems that may be required in a building.

**Sec. 907.2. Determine compliance with fire alarm provisions.** Fire alarm systems are typically mandated based upon the occupancy classification and the number of occupants.

**Sec. 905.3. Determine if standpipe system is required.** A standpipe system is required in buildings once a specified height is reached to provide for a more effective means of fighting a fire within the building.

**Sec. 905.4.6. Verify location of standpipe hose connections.**

**8. Identify and evaluate materials utilized as interior floor, wall and ceiling finishes.** Finish materials within the building are primarily regulated for flame spread and smoke development characteristics.

**Sec. 803.9. Verify compliance of wall and ceiling finishes.** Interior wall and ceiling finishes are regulated based upon the occupancy classification of the space and their location within the means of egress system. The classification may typically be reduced where sprinkler protection is provided.

**Sec. 804.4. Verify compliance of floor finishes.** While regulated differently than wall and ceiling finishes, floor finishes comprised of fibers are also controlled based upon their use in the egress system, the occupancy classification, and the presence of a sprinkler system.

**9. Evaluate means of egress system based on anticipated occupant loads.** The expected occupant load is the basis for the design of the means of egress system. The egress elements must provide for a direct, continuous, obvious, undiminished and unobstructed path of travel from any occupiable point in the building to the public way.

**Sec. 1004. Determine the design occupant load.** Although the primary use of an occupant load is in the design of the building's means of egress system, occupant load is also occasionally an important factor in occupancy classification, sprinkler system and fire alarm system requirements, and plumbing fixture counts.

**Chapter 10. Verify compliance with means of egress provisions.** The means of egress system is intended to provide the primary occupant protection from fire and other hazards. The system consists of two major components, egress components and egress design.

- Sec. 1005.1 Egress width and distribution
- Sec. 1006.3 Emergency lighting
- Sec. 1007 Accessible means of egress
- Sec. 1008.1.2 Door swing
- Sec. 1008.1.9 Door operations
- Sec. 1008.1.10 Panic hardware
- Sec. 1009.1 Stairway width
- Sec. 1009.4 Stairway treads and risers
- Sec. 1011 Exit signs
- Sec. 1012 Stairway and ramp handrails
- Sec. 1013 Guards
- Sec. 1014.2 Egress through intervening spaces
- Sec. 1014.3 Common path of egress travel
- Sec. 1015.1 Number of exit or exit access doorways
- Sec. 1015.2 Egress separation
- Sec. 1016.1 Travel distance
- Sec. 1018.1 Corridor construction
- Sec. 1021 Number of exits
- Sec. 1022 Vertical exit enclosures
- Sec. 1023 Exit passageways
- Sec. 1025 Horizontal exits
- Sec. 1026 Exterior exit stairways
- Sec. 1027 Exit discharge
- Sec. 1028 Egress from assembly occupancies

**10. Identify any special use features of the building.** The activities that occur within the building pose varying risks to the occupants. Special conditions are applicable when such activities are anticipated.

**Chapter 4. Verify compliance with special detailed requirements.** These provisions are often an extension of the general requirements found elsewhere in the code.

- Sec. 410 Stages and platforms
- Sec. 413 Combustible storage
- Sec. 414 Hazardous materials
- Sec. 416 Application of flammable finishes

**11. Determine areas of building and site required to be accessible.** In general, access to persons with disabilities is required for all buildings.

**Chapter 11A and/or 11B. Verify compliance with accessibility provisions.** In order to be considered as accessible, buildings and their individual elements must comply with the applicable technical provisions of Chapters 11A and/or 11B.

**12. Determine extent of other miscellaneous provisions.** Additional provisions may be applicable based upon each individual building and its characteristics.

**Sec. 2406.3. Verify safety glazing provided in hazardous locations.** Safety glazing must be appropriately identified to ensure the proper glazing material is installed in areas considered as subject to human impact.

**Chapter 12. Interior environment.** Provisions regulating ventilation, temperature control, lighting, sound transmission, room dimensions and surrounding materials associated with interior spaces.

**Chapter 14 Exterior walls.** Requirements for installation of wall coverings and the permissible use of combustible materials on the exterior side of exterior walls.

**Chapter 24. Glass and glazing.** General provisions for the installation of glazing materials and skylights.

**Chapter 30. Elevators.** Elevator hoistway provisions, including enclosure of hoistways, emergency operations and hoistway venting.

**Chapter 31. Special construction.** A variety of special conditions are addressed, including membrane structures, temporary structures, pedestrian walkways and tunnels, awnings and canopies, marquees, signs and swimming pool enclosures.

## Structural Provisions

### General Requirements

#### 1. Design Loads.

The 2012 IBC references the national load standard, Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-10) with Supplement Number 2.

Determine the applicable design loads that the building structure is expected to be subjected to. Code prescribed loads are given in Chapter 16 and the referenced standard, ASCE/SEI 7. The code prescribed minimum live loads are given in IBC Table 1607.1.

The various code prescribed loads are probabilistic in nature. Environmental loads, such as flood, rain, snow, seismic and wind vary based on the location of the building site. The following table gives the IBC section and ASCE/SEI 7 chapter for various types of load.

REFERENCED IBC SECTIONS AND ASCE/SEI 7 CHAPTERS FOR LOADS		
TYPE OF LOAD	IBC SECTION	ASCE/SEI 7 CHAPTER
Dead loads	Section 1606	Chapter 3
Live loads	Section 1607, Table 1607.1	Chapter 4
Snow loads	Section 1608	Chapter 7
Wind loads	Section 1609	Chapter 6
Soil lateral loads	Section 1610	Chapter 3
Rain loads	Section 1611	Chapter 8
Flood loads	Section 1612	Chapter 51
Earthquake loads	Section 1613	Chapter 11-22

1. Section 1612 references ASCE 24 which references Chapter 5 of ASCE/SEI 7

## 2. Structural Materials.

The structural design begins with the selection of the type of structural materials to be used to support the building. Structural framing systems are constructed of concrete, masonry, steel or wood. Some miscellaneous or specialty structures and components, such as awnings, canopies and cladding, are often constructed of aluminum.

The design of various structural materials is covered in specific material chapters in the code which in turn reference design standards for the type of material involved. The referenced standards in the 2012 IBC for the structural materials are shown in the following table:

STRUCTURAL DESIGN STANDARDS FOR STRUCTURAL MATERIALS <sup>1</sup>		
MATERIAL	IBC/CBC CHAPTER	REFERENCED STANDARD
Concrete	19	ACI 318—11 Building Code Requirements for Structural Concrete
Aluminum	20	ADM 1—10 Aluminum Design Manual
Masonry	21	TMS 402-11/ACI 530-11/ASCE 5-11 Building Code Requirements and Specification for Masonry Structures (MSJC Code)
Steel	22	AISC 360—10 Specification for Structural Steel Buildings
		AISC 341—10 Seismic Provisions for Structural Steel Buildings
Wood	23	AISI S100—07/S2-10 North American Specification for the Design of Cold-Formed Steel Structural Members, with Supplement 1, dated 2010.
		AF&PA NDS—12 National Design Specification (NDS) for Wood Construction with 2012 Supplement
		AF&PA SDPWS—08 Special Design Provisions for Wind and Seismic

1. The above table shows the main structural design standards for these structural materials. For a complete list of referenced standards, see IBC Chapter 35.

## 3. Structural Analysis, Design and Detailing.

Once the applicable loads are determined, the structural system of the building must be analyzed to determine the effects of the governing gravity and lateral loads that act on the structure. The structural system of a typical building consists of the roof and floor systems, walls, beams and columns, and the foundation. From the structural analysis, the next step is to design the structural members, elements and systems to provide the minimum level of resistance in accordance with the various load combinations prescribed in Section 1605.

Once the structural elements and systems are designed, the next step is to detail the load transfer connections to provide a complete load path from the point of origin to the resisting element. In general, the ultimate resisting element of buildings and structures is the foundation and supporting ground. The final step is to prepare a complete set of construction documents as required by Sections 107 and 1603. Construction documents are defined in Section 202 as “Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.” In general, construction documents consist of plans, specifications and calculations.

Section 1603.1 requires construction documents to show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. Design loads required by Sections 1603.1.1 through 1603.1.9 must be indicated on the construction documents. If complete construction documents consisting of plans, specifications and calculations are provided, the items listed in Sections 1603.1.1 through 1603.9 are generally included.

The exception permits construction documents for buildings constructed in accordance with the conventional light-frame construction provisions of Section 2308 need only indicate the following:

- Floor and roof live loads
- Ground snow load,  $P_g$ .
- Basic (3-second gust) wind speed (mph) and wind exposure category.
- Seismic design category and site class.
- Flood design data where sited in flood hazard areas
- Design load-bearing values of soils.

## General Requirements

### 1. Occupancy Category (IBC/CBC Table 1604.5).

Determine the occupancy category of the building based on Table 1604.5.

Where a structure is occupied by two or more occupancies that are not the same occupancy category, the building must be classified in the highest occupancy category corresponding to the various occupancies.

Where structures have two or more portions that are structurally separated, each separate portion should be separately classified.

Where a separated portion of a structure provides required access or egress from another portion of the building with a higher occupancy category, both portions of the building must be assigned the higher occupancy category.

Where a separated portion of a structure shares life safety components with another portion of the building with a higher occupancy category, both portions of the building must be assigned the higher occupancy category.

### 2. Floor and roof live loads (IBC/CBC Table 1607.1).

Determine uniformly distributed and concentrated floor live load for the floor areas of the building in accordance with Section 1603.1.1 and Table 1607.1.

Floor live load reduction in accordance with Section 1607.9 should be indicated for each type of live load that is reduced.

Determine the roof live load for roof areas in accordance with Section 1607.11.

Roof live load reduction in accordance with Section 1607.11.2 should be indicated for roof live loads that are reduced.

### 3. Snow load (IBC/CBC Section 1608, ASCE/SEI 7 Section 7).

Determine the ground snow load,  $P_g$ , based on the location of the building site in accordance with Figure 1608.2 for the contiguous United States and Table 1608.2 for Alaska.

In areas where the ground snow load,  $P_g$ , exceeds 10 psf, the following information should be determined:

1. Flat-roof snow load,  $P_f$
2. Snow exposure factor,  $C_e$ .
3. Snow load importance factor,  $I$ .
4. Thermal factor,  $C_r$ .

### 4. Wind speed and wind exposure category.

Determine the following information related to wind loads in accordance with Section 1603.1.4:

1. Basic 3-second gust wind speed (mph).
2. Wind importance factor,  $I$ .
3. Wind exposure category (B, C, D). If more than one wind exposure is used, the wind exposure for each wind direction should be determined.
4. The applicable internal pressure coefficient.
5. The design wind pressure (psf) used for the design of exterior component and cladding materials not specifically designed by the registered design professional should be indicated.

## 5. Earthquake design requirements.

Determine the following information related to seismic loads regardless of whether seismic loads govern the design of the lateral-force-resisting system of the building:

1. Seismic importance factor,  $I$ , based on occupancy category.
2. Mapped spectral response accelerations,  $S_s$  and  $S_i$ .
3. Site class.
4. Design spectral response coefficients,  $S_{DS}$  and  $S_{DI}$ .
5. Seismic design category.
6. Basic seismic-force-resisting system(s).
7. Design base shear.
8. Seismic response coefficient(s),  $C_s$ .
9. Response modification factor(s),  $R$ .
10. Analysis procedure used.

## 6. Geotechnical information.

The design load bearing values of soils shall be shown on the construction documents in accordance with Section 1603.1.6.

## 7. Special loads.

Determine any special loads that are applicable to the design of the building, structure or portions thereof along with the specific section of the code that addresses the special loading condition in accordance with Section 1603.1.8.

## 8. Load combinations.

Buildings and other structures and portions thereof are required to be designed to resist the load combinations specified in Section 1605.2 or 1605.3 and Chapters 18 through 23, and the special seismic load combinations with overstrength as required by Section 1605.1 and ASCE/SEI 7.

## 9. Wind and seismic detailing.

Lateral-force-resisting systems are required to conform to the seismic detailing requirements of the code and ASCE/SEI 7 (excluding Chapter 14 and Appendix 11A) even when wind load effects are greater than seismic load effects. See Section 1604.10.

## 10. Serviceability.

Structural systems and members shall be designed to have adequate stiffness to limit deflections and lateral drift. The deflection of structural members shall not exceed the more restrictive of the limitations of Sections 1604.3.2 through 1604.3.6 or that permitted by Table 1604.3. Structural systems shall be designed to have adequate stiffness to limit deformation and lateral drift due to earthquake loading in accordance with Section 12.12.1 of ASCE/SEI 7.

## 11. Foundation.

A foundation system must be designed that provides adequate support for gravity and lateral loads. Walls of buildings of conventional light frame construction, as defined in Section 202, are permitted to be supported by footings constructed in accordance with Table 1809.7. Otherwise, the foundation system must be designed in accordance with other provisions of Chapter 18. The following table gives a summary of applicable sections for foundation systems.

FOUNDATION REQUIREMENTS	
SUBJECT	IBC SECTION
Presumptive load-bearing values of soils	1806, Table 1806.2
Foundation walls, retaining walls and embedded posts & poles	1807
General requirements for foundations	1808
Minimum concrete specified concrete strength	Table 1808.8.1
Minimum concrete cover	Table 1808.8.2
Shallow foundations (footings)	1809
Prescriptive footings for light frame walls	Table 1809.7
Deep foundations	1810

A geotechnical investigation is required where required by Section 1803.2 unless the building official determines that a soils investigation is not required in accordance with the exception. A geotechnical investigation is required for buildings assigned to Seismic Design Categories C, D, E and F in accordance with Sections 1803.5.11 and 1803.5.12.

## **12. Excavation, grading and fill**

Requirements for excavation, grading and fill related to foundation construction are covered in Section 1804. General requirements for site grading are covered in Appendix J.

## **13. Flood design data.**

Where required by Section 1612.5, buildings located in flood hazard areas as established in Section 1612.3 are required to provide documentation that includes the following information regardless of whether flood loads govern the design of the building:

1. In flood hazard areas not subject to high-velocity wave action, the elevation of the proposed lowest floor, including the basement; and the elevation to which any nonresidential building will be dry flood proofed.
2. In flood hazard areas not subject to high-velocity wave action, the elevation to which any nonresidential building will be dry floodproofed.
3. In flood hazard areas subject to high-velocity wave action, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

## **14. Special inspection.**

Where special inspection, special inspection for seismic resistance, or structural testing for seismic resistance is required by Section 1704, 1707 or 1708, the registered design professional in responsible charge is required to prepare a statement of special inspections in accordance with Section 1705. The statement of special inspections must be submitted by the permit applicant as a condition of permit issuance in accordance with Section 106.1.

A statement of special inspections is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308 unless specific components in the structure require special inspection.

The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.

<b>SPECIAL INSPECTION REQUIREMENTS</b>		
<b>TYPE OF SPECIAL INSPECTION</b>	<b>APPLICABLE SECTION</b>	<b>REQUIRED VERIFICATION AND INSPECTION</b>
Steel construction	1704.3	Table 1704.3
Concrete construction	1704.4	Table 1704.4
Masonry construction Level 1 Level 2	1704.5	Table 1704.5.1 Table 1704.5.3
Wood construction	1704.6	—
Soils	1704.7	Table 1704.7
Driven deep foundations	1704.8	Table 1704.8
Cast in place deep foundations	1704.9	Table 1704.9
Helical pile foundations	1704.10	—
Vertical masonry foundations	1704.11 1704.5	—
Sprayed fire resistant materials	1704.12	—
Mastic and intumescent fire resistive coatings	1704.13	—
Exterior insulation and finish (EIFS) systems	1704.14	—
Special cases	1704.15	—
Smoke control systems	1704.16	—

Where required by the provisions of Section 1709.2 or 1709.3, the owner shall employ a registered design professional to perform structural observations as defined in Section 1702. At the conclusion of the work included in the permit, the structural observer shall submit a written statement to the building official that identifies any reported deficiencies that have not been resolved.

**15. Special inspection for wind and seismic resistance.**

Section 1706.1 requires special inspections for wind requirements based on wind speed and exposure category as prescribed in Sections 1706.2 through 1706.4, unless exempted by the exceptions to Section 1704.1.

Section 1707.1 requires special inspections for seismic resistance based on seismic design category as prescribed in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1 or 1705.3.

**16. Structural testing for seismic resistance.**

Section 1708.1 requires specific testing and qualification for seismic resistance as prescribed in Sections 1708.2 through 1708.5, unless exempted from special inspections by the exceptions of Section 1704.1 and 1705.3.

**17. Structural observation.**

Where required by the provisions of Section 1710.2 or 1710.3 the owner is required to employ a registered design professional to perform structural observations as defined in Section 1702. Section 1710.2 requires structural observations for seismic resistance for certain structures assigned to Seismic Design Category D, E or F; Section 1710.3 requires structural observations for wind requirements for certain structures sited where the wind speed exceeds 110 mph.

At the conclusion of the work included in the permit, the structural observer is required to submit a written statement to the building official that identifies any reported deficiencies that have not been resolved.

Prior to the commencement of observations, the structural observer is required to submit a written statement to the building official identifying the structural observations.

At the conclusion of the work included in the permit, the structural observer is required to submit a written statement to the building official indicating what site visits have been made, identifies any deficiencies that have not been resolved.

**18. Contractor responsibility.**

Section 1709 requires each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections is required to submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. (The term "designated seismic system" is defined in Section 1702 and Section 11.2 of ASCE/SEI 7). The contractor's statement of responsibility is required to acknowledge awareness of the special requirements contained in the statement of special inspections.

**19. Phased approvals.**

Construction of foundations or other part of a building is permitted before the construction documents for the whole building or structure have been submitted, provided adequate information has been filed. The holder of such permit for the foundation or other part of a building proceeds at their own risk and without assurance that a permit for the entire structure will be granted.

**20. Amended construction documents.**

Work must be constructed in accordance with the approved construction documents and any changes made during construction that are not in compliance with the approved construction documents must be resubmitted for approval as amended construction documents.

**21. Deferred submittals.**

Deferred submittals are items that are not submitted at the time of permit application and must have the prior approval of the building official in accordance with Section 107.3.4.2. The registered design professional in responsible charge is required to list the deferred submittals on the construction documents for review by the building official. Documents for deferred submittal items must be reviewed by the registered design professional in responsible charge who will forward them to the building official with a notation indicating that they have been reviewed and are in general conformance with the design of the building.

# **How to Distinguish Between Model Code Language and California Amendments**

*To distinguish between model code language and the incorporated California amendments, including exclusive California standards, California amendments will appear in italic font print.*

[BSC] This is an example of a state agency acronym used to identify an adoption or amendment by the agency. The acronyms will appear at California Amendments and in the Matrix Adoption Tables. Sections 1.2 through 1.14 in Chapter 1, Division 1 of this code, explain the used acronyms, the application of state agency adoptions to building occupancies or building features, the enforcement agency as designated by state law (may be the state adopting agency or local building or fire official), the authority in state law for the state agency to make the adoption, and the specific state law being implemented by the agency's adoption. The following acronyms are used in Title 24 to identify the state adopting agency making an adoption.

## **Legend of Acronyms of Adopting State Agencies**

BSC	<i>California Building Standards Commission (see Section 1.2)</i>
BSCC	<i>Board of State and Community Corrections (see Section 1.3)</i>
SFM	<i>Office of the State Fire Marshal (see Section 1.11)</i>
HCD 1	<i>Department of Housing and Community Development (see Section 1.8.2.1.1)</i>
HCD 2	<i>Department of Housing and Community Development (see Section 1.8.2.1.3)</i>
HCD 1/AC	<i>Department of Housing and Community Development (see Section 1.8.2.1.2)</i>
DSA-AC	<i>Division of the State Architect-Access Compliance (see Section 1.9.1)</i>
DSA-SS	<i>Division of the State Architect-Structural Safety (see Section 1.9.2)</i>
DSA-SS/CC	<i>Division of the State Architect-Structural Safety/Community Colleges (see Section 1.9.2.2)</i>
OSHPD 1	<i>Office of Statewide Health Planning and Development (see Section 1.10.1)</i>
OSHPD 2	<i>Office of Statewide Health Planning and Development (see Section 1.10.2)</i>
OSHPD 3	<i>Office of Statewide Health Planning and Development (see Section 1.10.3)</i>
OSHPD 4	<i>Office of Statewide Health Planning and Development (see Section 1.10.4)</i>
DPH	<i>Department of Public Health (see Section 1.7)</i>
AGR	<i>Department of Food and Agriculture (see Section 1.6)</i>
CEC	<i>California Energy Commission (see Section 100 in Part 2, the California Energy Code)</i>
CA	<i>Department of Consumer Affairs (see Section 1.6): Board of Barbering and Cosmetology Board of Examiners in Veterinary Medicine Board of Pharmacy Acupuncture Board Bureau of Home Furnishings Structural Pest Control Board</i>
SL	<i>State Library (see Section 1.12)</i>
SLC	<i>State Lands Commission (see Section 1.14)</i>
DWR	<i>Department of Water Resources (see Section 1.12 of Chapter 1 of the California Plumbing Code in Part 2 of Title 24)</i>

The state agencies are available to answer questions about their adoptions. Contact information is provided on page iv of this code.

To learn more about the use of this code refer to pages xvii and xviii. Training materials on the application and use of this code are available at the website of the California Building Standards Commission [www.bsc.ca.gov](http://www.bsc.ca.gov).



# California Matrix Adoption Tables

## Format of the California Matrix Adoption Tables

The matrix adoption tables, examples of which follow, are non-regulatory aids intended to show the user which state agencies have adopted and/or amended given sections of the model code. An agency's statutory authority for certain occupancies or building applications determines which chapter or section may be adopted, repealed, amended or added. See Chapter 1, Division I, Sections 1.2 through 1.14 for agency authority, building applications and enforcement responsibilities.

The side headings identify the scope of state agencies' adoption as follows:

### Adopt the entire IBC chapter without state amendments.

If there is an "X" under a particular state agency's acronym on this row; this means that particular state agency has adopted the entire model code chapter without any state amendments.

#### Example:

**CALIFORNIA BUILDING CODE-MATRIX ADOPTION TABLE**  
(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authorityand building application.)

#### CHAPTER 2 – DEFINITIONS AND ABBREVIATIONS

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CA	SL	SLC
			1	2	1-AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter		X																	
Adopt entire chapter as amended (amended sections listed below)						S	A	M	P	L	E								
Adopt only those sections that are listed below																			
Chapter/Section																			

### Adopt the entire IBC chapter as amended, state-amended sections are listed below:

If there is an "X" under a particular state agency's acronym on this row, it means that particular state agency has adopted the entire model code chapter; with state amendments.

Each state-amended section that the agency has added to that particular chapter is listed. There will be an "X" in the column, by that particular section, under the agency's acronym, as well as an "X" by each section that the agency has adopted.

#### Example:

#### CHAPTER 2 – DEFINITIONS AND ABBREVIATIONS

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CA	SL	SLC
			1	2	1-AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter																			
Adopt entire chapter as amended (amended sections listed below)		X																	
Adopt only those sections that are listed below						S	A	M	P	L	E								
Chapter/Section																			
202		X																	

**Adopt only those sections that are listed below:**

If there is an "X" under a particular state agency's acronym on this row, it means that particular state agency is adopting only specific model code or state-amended sections within this chapter. There will be an "X" in the column under the agency's acronym, as well as an "X" by each section that the agency has adopted.

**Example:****CHAPTER 2 – DEFINITIONS AND ABBREVIATIONS**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CA	SL	SLC
			1	2	1-AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below			X	X		S	A	M	P	L	E								
Chapter 1																			
202			X	X		S	A	M	P	L	E								
202			X	X		C	O	N	T.										
203			X	X															
203			X	X															

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# CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

## CHAPTER 1 – ADMINISTRATION

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter																				
Adopt entire chapter as amended (amended sections listed below)																				
Adopt only those sections that are listed below	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Chapter / Section																				
Division I – <i>California Administration</i>																				
1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1.2	X	X																		
1.2.2							X													
1.3	X													X						
1.4	X																		X	
1.5 (Reserved)	X																			
1.6	X															X				
1.7	X																X			
1.8	X	X	X	X																
1.9	X																			
1.9.1 – 1.9.1.8						X														
1.9.2.1								X												
1.9.2.1.1									X											
1.9.2.1.2									X											
1.9.2.1.3									X											
1.9.2.2										X										
1.9.2.2.1										X										
1.9.2.2.2										X										
1.9.2.2.3										X										
1.9.2.2.4										X										
1.9.3										X										
1.10	X																			
1.10.1											X									
1.10.2											X									
1.10.3												X								
1.10.4												X								
1.11	X																			
1.12	X																		X	
1.13 (Reserved)																				
1.14																			X	
Division II – <i>Scope and Administration</i>																				
101.1 – 101.4.5						X					X	X	X	X						
101.4.6, <i>Exception</i>											X	X		X						
102.1									X	X	X	X	X	X						
102.2 – 102.4									X	X	X	X	X	X						
102.4.1									X	X										
102.4.3									X	X	X	X	X	X						
102.4.4									X	X	X	X	X	X						
102.5									X	X	X	X	X	X						
102.6 – 104.1											X	X	X	X						
104.2 – 104.4	X										X	X	X	X						
104.5 – 104.8											X	X	X	X						

*(continued)*

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 1 – ADMINISTRATION—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter																				
Adopt entire chapter as amended (amended sections listed below)																				
Adopt only those sections that are listed below	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Chapter / Section																				
Division II – Scope and Administration-cont'd																				
104.9		X					X	X	X	X	X	X								
104.10								X	X	X	X	X								
104.11							X	X	X	X	X	X								
104.11.1 – 104.11.2										X	X	X	X							
104.11.3 – 104.11.4										X		X								
105.1		X								X	X	X	X							
105.1.1 – 105.2										X	X	X	X							
105.2 Building: 1-13			X	X																
105.2.1 – 105.2.2		X								X	X	X	X							
105.2.3										X	X	X	X							
105.3 – 105.3.1		X								X	X	X	X							
105.3.2										X	X		X							
105.4		X								X	X	X	X							
105.5										X	X	X	X							
105.6 – 105.7		X								X	X	X	X							
106.1		X					X	X	X	X	X	X	X							
106.1.1							X	X	X	X	X	X	X							
106.1.2										X	X		X							
106.2 – 106.3		X								X	X	X	X							
107.1		X	X	X						X	X	X	X							
107.2.1			X	X																
107.2.4			X	X																
107.2.5			X	X																
107.2 - 107.3		X								X	X	X	X							
107.3.4.2										X	X		X							
107.4		X								X	X		X							
107.5		X								X	X	X	X							
108.1 – 108.4		X								X	X	X	X							
109										X	X	X	X							
110.1 – 110.3		X								X	X	X	X							
110.3.1 – 110.3.3			X	X						X	X	X	X							
110.3.4 – 110.3.6		X	X	X						X	X	X	X							
110.3.8 – 110.3.10		X	X	X						X	X	X	X							
110.4 – 110.6		X								X	X	X	X							
111.1		X								X	X	X	X							
111.2		X				X				X	X	X	X							
111.3 – 111.4		X								X	X	X	X							
112		X								X	X	X	X							
113										X	X	X	X							
114.1 – 114.2		X								X	X	X	X							
114.2 – 114.3										X	X	X	X							
115 - 116		X								X	X	X	X							

# CHAPTER 1

## SCOPE AND ADMINISTRATION

### DIVISION I

### CALIFORNIA ADMINISTRATION

#### SECTION 1.1

##### GENERAL

**1.1.1 Title.** These regulations shall be known as the California Building Code, may be cited as such and will be referred to herein as "this code." The California Building Code is Part 2 of twelve parts of the official compilation and publication of the adoption, amendment and repeal of building regulations to the California Code of Regulations, Title 24, also referred to as the California Building Standards Code. This part incorporates by adoption the 2012 International Building Code of the International Code Council with necessary California amendments.

**1.1.2 Purpose.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, access to persons with disabilities, sanitation, adequate lighting and ventilation and energy conservation; safety to life and property from fire and other hazards attributed to the built environment; and to provide safety to fire fighters and emergency responders during emergency operations.

**1.1.3 Scope.** The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout the State of California.

**1.1.3.1 Nonstate-regulated buildings, structures and applications.** Except as modified by local ordinance pursuant to Section 1.1.8, the following standards in the California Code of Regulations, Title 24, Parts 2, 2.5, 3, 4, 5, 6, 9, 10 and 11 shall apply to all occupancies and applications not regulated by a state agency.

**1.1.3.2 State-regulated buildings, structures and applications.** The model code, state amendments to the model code, and/or state amendments where there are no relevant model code provisions shall apply to the following buildings, structures, and applications regulated by state agencies as specified in Sections 1.2 through 1.14, except where modified by local ordinance pursuant to Section 1.1.8. When adopted by a state agency, the provisions of this code shall be enforced by the appropriate enforcing agency, but only to the extent of authority granted to such agency by the state legislature.

**Note:** See Preface to distinguish the model code provisions from the California provisions.

1. State-owned buildings, including buildings constructed by the Trustees of the California State University, and to the extent permitted by Califor-

nia laws, buildings designed and constructed by the Regents of the University of California, and regulated by the Building Standards Commission. See Section 1.2 for additional scope provisions.

2. Local detention facilities regulated by the Corrections Standards Authority. See Section 1.3 for additional scope provisions.
3. Barbering, cosmetology or electrolysis establishments, acupuncture offices, pharmacies, veterinary facilities and structural pest control locations regulated by the Department of Consumer Affairs. See Section 1.4 for additional scope provisions.
4. Energy efficiency standards regulated by the California Energy Commission. See Section 1.5 for additional scope provisions.
5. Dairies and places of meat inspection regulated by the Department of Food and Agriculture. See Section 1.6 for additional scope provisions.
6. Organized camps, laboratory animal quarters, public swimming pools, radiation protection, commissaries serving mobile food preparation vehicles and wild animal quarantine facilities regulated by the Department of Public Health. See Section 1.7 for additional scope provisions.
7. Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilets or cooking facilities. See Section 1.8.2.1.1 for additional scope provisions.
8. Accommodations for persons with disabilities in buildings containing newly constructed covered multifamily dwellings, new common use spaces serving existing covered multifamily dwellings, additions to existing buildings where the addition alone meets the definition of "COVERED MULTIFAMILY DWELLING," and common-use spaces serving covered multifamily dwellings, which are regulated by the Department of Housing and Community Development. See Section 1.8.2.1.2 for additional scope provisions.
9. Permanent buildings and permanent accessory buildings or structures constructed within mobile-home parks and special occupancy parks regulated by the Department of Housing and Community Development. See Section 1.8.2.1.3 for additional scope provisions.

10. Accommodations for persons with disabilities regulated by the Division of the State Architect. See Section 1.9.1 for additional scope provisions.
  11. Public elementary and secondary schools, community college buildings and state-owned or state-leased essential service buildings regulated by the Division of the State Architect. See Section 1.9.2 for additional scope provisions.
  12. Qualified historical buildings and structures and their associated sites regulated by the State Historical Building Safety Board with the Division of the State Architect. See Section 1.9.3 for additional scope provisions.
  13. General acute care hospitals, acute psychiatric hospitals, skilled nursing and/or intermediate care facilities, clinics licensed by the Department of Public Health and correctional treatment centers regulated by the Office of Statewide Health Planning and Development. See Section 1.10 for additional scope provisions.
  14. Applications regulated by the Office of the State Fire Marshal include, but are not limited to, the following in accordance with Section 1.11:
    - 14.1. Buildings or structures used or intended for use as an:
      1. Asylum, jail, prison
      2. Mental hospital, hospital, home for the elderly, children's nursery, children's home or institution, school or any similar occupancy of any capacity
      3. Theater, dancehall, skating rink, auditorium, assembly hall, meeting hall, nightclub, fair building or similar place of assemblage where 50 or more persons may gather together in a building, room or structure for the purpose of amusement, entertainment, instruction, deliberation, worship, drinking or dining, awaiting transportation, or education
      4. Small family day-care homes, large family day-care homes, residential facilities and residential facilities for the elderly, residential care facilities
      5. State institutions or other state-owned or state-occupied buildings
      6. High rise structures
      7. Motion picture production studios
      8. Organized camps
      9. Residential structures
  - 14.2. Tents, awnings or other fabric enclosures used in connection with any occupancy
  - 14.3. Fire alarm devices, equipment and systems in connection with any occupancy
  - 14.4. Hazardous materials, flammable and combustible liquids
  - 14.5. Public school automatic fire detection, alarm and sprinkler systems
  - 14.6. Wildland-urban interface fire areas
  15. Public libraries constructed and renovated using funds from the California Library Construction and Renovation Bond Act of 1988 and regulated by the State Librarian. See Section 1.12 for additional scope provisions.
  16. Graywater systems regulated by the Department of Water Resources. See Section 1.13 for additional scope provisions.
  17. For applications listed in Section 1.9.1 regulated by the Division of the State Architect—Access Compliance, outdoor environments and uses shall be classified according to accessibility uses described in Chapters 11B.
  18. Marine Oil Terminals regulated by the California State Lands Commission. See Section 1.14 for additional scope provisions.
- 1.1.4 Appendices.** Provisions contained in the appendices of this code shall not apply unless specifically adopted by a state agency or adopted by a local enforcing agency in compliance with Health and Safety Code Section 18901 et. seq. for Building Standards Law, Health and Safety Code Section 17950 for State Housing Law and Health and Safety Code Section 13869.7 for Fire Protection Districts. See Section 1.1.8 of this code.
- 1.1.5 Referenced codes.** The codes, standards and publications adopted and set forth in this code, including other codes, standards and publications referred to therein are, by title and date of publication, hereby adopted as standard reference documents of this code. When this code does not specifically cover any subject related to building design and construction, recognized architectural or engineering practices shall be employed. The National Fire Codes, standards, and the Fire Protection Handbook of the National Fire Protection Association are permitted to be used as authoritative guides in determining recognized fire prevention engineering practices.
- 1.1.6 Nonbuilding standards, orders and regulations.** Requirements contained in the California Building Code, or in any other referenced standard, code or document, which are not building standards as defined in Health and Safety Code Section 18909, shall not be construed as part of the provisions of this code. For nonbuilding standards, orders and regulations, see other titles of the California Code of Regulations.
- 1.1.7 Order of precedence and use.**
- 1.1.7.1 Differences.** In the event of any differences between these building standards and the standard refer-

ence documents, the text of these building standards shall govern.

**1.1.7.2 Specific provisions.** Where a specific provision varies from a general provision, the specific provision shall apply.

**1.1.7.3 Conflicts.** When the requirements of this code conflict with the requirements of any other part of the California Building Standards Code, Title 24, the most restrictive requirements shall prevail.

**1.1.8 City, county, or city and county amendments, additions or deletions.** The provisions of this code do not limit the authority of city, county, or city and county governments to establish more restrictive and reasonably necessary differences to the provisions contained in this code pursuant to complying with Section 1.1.8.1. The effective date of amendments, additions or deletions to this code by a city, county, or city and county filed pursuant to Section 1.1.8.1 shall be the date filed. However, in no case shall the amendments, additions or deletions to this code be effective any sooner than the effective date of this code.

Local modifications shall comply with Health and Safety Code Section 18941.5 for Building Standards Law, Health and Safety Code Section 17958 for State Housing Law or Health and Safety Code Section 13869.7 for Fire Protection Districts.

#### 1.1.8.1 Findings and filings.

1. The city, county, or city and county shall make express findings for each amendment, addition or deletion based upon climatic, topographical or geological conditions.

**Exception:** Hazardous building ordinances and programs mitigating unreinforced masonry buildings.

2. The city, county, or city and county shall file the amendments, additions or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions, and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county or city and county and filed with the California Department of Housing and Community Development, Division of Codes and Standards, 2020 West El Camino Ave., Suite 250, Sacramento, CA. 95833.

**1.1.9 Effective date of this code.** Only those standards approved by the California Building Standards Commission that are effective at the time an application for building permit is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the History Note page of this code.

**1.1.10 Availability of codes.** At least one complete copy each of Titles 8, 19, 20, 24 and 25 with all revisions shall be maintained in the office of the building official responsible for the administration and enforcement of this code. Each state department concerned and each city, county, or city and county shall have an up-to-date copy of the code available for public inspection. See Health and Safety Code Section 18942(d)(1) and (2).

**1.1.11 Format.** This part fundamentally adopts the International Building Code by reference on a chapter-by-chapter basis. When a specific chapter of the International Building Code is not printed in the code and is marked "Reserved", such chapter of the International Building Code is not adopted as a portion of this code. When a specific chapter of the International Building Code is marked "Not adopted by the State of California" but appears in the code, it may be available for adoption by local ordinance.

**Note:** Matrix Adoption Tables at the front of each chapter may aid the code user in determining which chapter or sections within a chapter are applicable to buildings under the authority of a specific state agency, but they are not to be considered regulatory.

**1.1.12 Validity.** If any chapter, section, subsection, sentence, clause or phrase of this code is for any reason held to be unconstitutional, contrary to statute, exceeding the authority of the state as stipulated by statutes or otherwise inoperative, such decision shall not affect the validity of the remaining portion of this code.

## SECTION 1.2 BUILDING STANDARDS COMMISSION

**1.2.1 Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.**

### 1. State buildings for all occupancies.

**Application**—State buildings (all occupancies), including buildings constructed by the Trustees of the California State University and the Regents of the University of California where no state agency has the authority to adopt building standards applicable to such buildings.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Health and Safety Code Section 18934.5.

**Reference**—Health and Safety Code, Division 13, Part 2.5, commencing with Section 18901.

### 2. University of California, California State Universities and California Community Colleges.

**Application**—Standards for lighting for parking lots and primary campus walkways at the University of California, California State Universities and California Community Colleges.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Government Code Section 14617.

**Reference**—Government Code Section 14617.

**3. Existing state-owned buildings, including those owned by the University of California and by the California State University.**

**Application**—Building seismic retrofit standards including abating falling hazards of structural and nonstructural components and strengthening of building structures. See also Division of the State Architect.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Health and Safety Code Section 16600.

**Reference**—Health and Safety Code Sections 16600 through 16604.

**4. Unreinforced masonry-bearing wall buildings.**

**Application**—Minimum seismic strengthening standards for buildings specified in Appendix Chapter A1 of the California Existing Building Code, except for buildings subject to building standards adopted pursuant to Health and Safety Code (commencing) with Section 17910.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Health and Safety Code Section 18934.6.

**Reference**—Health and Safety Code Sections 18901 through 18949.

**1.2.1.1 State building.** For purposes of this code, a “state building” is a structure for which a state agency or state entity has authority to construct, alter, enlarge, replace, repair or demolish.

**1.2.1.2 Enforcement.** [CSU, UC, Judicial Council and CDCR] State agencies or state entities authorized to construct state buildings may appoint a building official who is responsible to the agency for enforcement of the provisions of the California Building Standards Code.

**Exception:** State buildings regulated by other sections of this code remain the enforcement responsibility of the designated entities.

**1.2.1.3 Enforcement. Reserved for DGS.**

**1.2.2 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and

that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

**1.2.2.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

**1.2.2.2 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

**1.2.3 Adopting agency identification.** The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym BSC.

## **SECTION 1.3 BOARD OF STATE AND COMMUNITY CORRECTIONS**

**1.3.1 Specific scope of application** of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—Local detention facilities.

**Enforcing agency**—Board of State and Community Corrections.

**Authority cited**—Penal Code Section 6030; Welfare and Institutions Code Sections 207.1, 210 and 885.

**Reference**—Penal Code Section 6030; Welfare and Institutions Code Sections 207.1, 210 and 885.

**1.3.2 Adopting agency identification.** The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym BSCC.

## **SECTION 1.4 DEPARTMENT OF CONSUMER AFFAIRS**

**1.4.1 Specific scope of application** of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**1. Board of Barbering and Cosmetology.**

**Application**—Any establishment or mobile unit where barbering, cosmetology or electrolysis is being performed.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Business and Professions Code Section 7312.

**Reference**—Business and Professions Code Sections 7303, 7303.1, 7312 and 7313.

## 2. Acupuncture Board.

**Application**—Acupuncture offices.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Business and Professions Code Section 4933.

**Reference**—Business and Professions Code Sections 4928, 4928.1 and 4933.

## 3. Board of Pharmacy.

**Application**—Pharmacies.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Business and Professions Code Section 4005.

**Reference**—Business and Professions Code Sections 4005, 4127.7 and 4201.

## 4. Veterinary Medical Board.

**Application**—Veterinary facilities.

**Enforcing agency**—State or local agency specified by the applicable provisions of law.

**Authority cited**—Business and Professions Code Section 4808.

**Reference**—Business and Professions Code Sections 4800, 4800.1, 4808 and 4809.5.

## 5. Structural Pest Control Board.

**Application**—Structural pest control locations.

**Enforcing agency**—Structural Pest Control Board.

**Authority cited**—Business and Professions Code Section 8525.

**Reference**—Business and Professions Code Sections 8520, 8520.1 and 8525.

**1.4.2 Adopting agency identification.** The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym CA.

## SECTION 1.5 Reserved

## SECTION 1.6 DEPARTMENT OF FOOD AND AGRICULTURE

**1.6.1 Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.**

**Application**—Dairies and places of meat and poultry inspection.

**Enforcing agency**—Department of Food and Agriculture.

**Authority cited**—Food and Agricultural Code Sections 18735, 18960, 19384, 33481 and 33731.

**Reference**—Food and Agricultural Code Sections 18735, 18960, 19384, 33481 and 33731.

**1.6.2 Adopting agency identification.** The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym AGR.

## SECTION 1.7 CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

**1.7.1 Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.**

**California Department of Public Health**

**Application**—Organized camps, laboratory animal quarters, public swimming pools, radiation protection and producing facilities, commissaries serving mobile food preparation vehicles, wild animal quarantine facilities, shellfish facilities and food establishments.

**Enforcing agency**—The California Department of Public Health and the local health agencies.

**Authority cited**—Health and Safety Code Sections 1660, 18897.2, 110065, 112165, 113710, 114304, 115061, 116050, 121795 and 131200.

**Reference**—Health and Safety Code Sections 1650, 1660, 18897.2, 18897.4, 18897.7, 100150, 110065, 113705, 113710, 114825, 114965, 115061, 116050, 116503, 112165, 121795 and 131200.

**1.7.2 Adopting agency identification.** The provisions of this code applicable to buildings identified in this section will be identified in the Matrix Adoption Tables under the acronym DPH.

## SECTION 1.8 DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

**1.8.1 Purpose.** The purpose of this code is to establish the minimum requirements necessary to protect the health, safety and general welfare of the occupants and the public by governing accessibility, erection, construction, reconstruction, enlargement, conversion, alteration, repair, moving, removal, demolition, occupancy, use, height, court, area, sanitation, ventilation, maintenance and safety to life and property from fire and other hazards attributed to the built environment.

## SECTION 1.8.2 AUTHORITY AND ABBREVIATIONS

**1.8.2.1 General.** The Department of Housing and Community Development is authorized by law to promulgate and adopt building standards and regulations for several types of building applications. The applications under the authority of the Department of Housing and Community Development are listed in Sections 1.8.2.1.1 through 1.8.2.1.3.

**Note:** See the California Residential Code for detached one- and two-family dwellings and townhouses.

### 1.8.2.1.1 Housing construction.

**Application**—Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities, and uses thereto. Sections of this code which pertain to applications listed in this section are identified using the abbreviation “HCD 1.”

**Enforcing agency**—Local building department or the Department of Housing and Community Development.

**Authority cited**—Health and Safety Code Sections 17040, 17050, 17920.9, 17921, 17921.3, 17921.6, 17921.10, 17922, 17922.6, 17922.12, 17927, 17928, 17959.6, 18300, 18552, 18554, 18620, 18630, 18640, 18670, 18690, 18691, 18865, 18871.3, 18871.4, 18873, 18873.1, 18873.2, 18873.3, 18873.4, 18873.5, 18938.3, 18944.11 and 19990; and Government Code Section 12955.1.

**Reference**—Health and Safety Code Sections 17000 through 17062.5, 17910 through 17995.5, 18200 through 18700, 18860 through 18874, and Sections 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

### 1.8.2.1.2 Housing accessibility.

**Application**—“COVERED MULTIFAMILY DWELLINGS” as defined in Chapter 2 including, but not limited to, lodging houses, dormitories, timeshares, condominiums, shelters for homeless persons, congregate residences, apartment houses, dwellings, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities.

Sections of this code identified by the abbreviation “HCD 1-AC” require specific accommodations for “PERSONS WITH DISABILITIES” as defined in Chapter 2. The application of such provisions shall be in conjunction with other requirements of this code and apply only to newly constructed “COVERED MULTIFAMILY DWELLINGS” as defined in Chapter 2 of the California Building Code. “HCD 1-AC” applications include, but are not limited to, the following:

1. All newly constructed “COVERED MULTIFAMILY DWELLINGS” as defined in Chapter 2.

2. New “COMMON USE AREAS” as defined in Chapter 2 serving existing covered multifamily dwellings. ||

3. Additions to existing buildings, where the addition alone meets the definition of “COVERED MULTIFAMILY DWELLINGS” as defined in Chapter 2. ||

4. New common use areas serving new covered multifamily dwellings. ||

5. Where any portion of a building’s exterior is preserved, but the interior of the building is removed, including all structural portions of floors and ceilings, the building is considered a new building for determining the application of Chapter 11A. ||

“HCD 1-AC” building standards generally do not apply to public use areas or public accommodations such as hotels and motels, and public housing. Public use areas, public accommodations and public housing as defined in Chapter 2 of this code are subject to the Division of the State Architect (DSA-AC) in Chapter 11B, and are referenced in Section 1.9.1. ||

Newly constructed covered multifamily dwellings, which can also be defined as public housing, shall be subject to the requirements of Chapter 11A and Chapter 11B. ||

**Enforcing agency**—Local building department or the Department of Housing and Community Development.

**Authority cited**—Health and Safety Code Sections 17040, 17050, 17920.9, 17921, 17921.3, 17921.6, 17921.10, 17922, 17922.6, 17922.12, 17927, 17928, 17959.6, 18300, 18552, 18554, 18620, 18630, 18640, 18670, 18690, 18691, 18865, 18871.3, 18871.4, 18873, 18873.1, 18873.2, 18873.3, 18873.4, 18873.5, 18938.3, 18944.11 and 19990; and Government Code Section 12955.1.

**Reference**—Health and Safety Code Sections 17000 through 17062.5, 17910 through 17995.5, 18200 through 18700, 18860 through 18874, and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

### 1.8.2.1.3 Permanent buildings in mobilehome parks and special occupancy parks.

**Application**—Permanent buildings, and permanent accessory buildings or structures, constructed within mobilehome parks and special occupancy parks that are under the control and ownership of the park operator. Sections of this code which pertain to applications listed in this section are identified using the abbreviation “HCD 2.” <

**Enforcing agency**—The Department of Housing and Community Development, local building department or other local agency that has assumed responsibility for the enforcement of Health and

*Safety Code, Division 13, Part 2.1 commencing with Section 18200 for mobilehome parks and Health and Safety Code, Division 13, Part 2.3 commencing with Section 18860 for special occupancy parks.*

**Authority cited—***Health and Safety Code Sections 17040, 17050, 17920.9, 17921, 17921.3, 17921.6, 17821.10, 17922, 17922.6, 17922.12, 17927, 17928, 17959.6, 18300, 18552, 18554, 18620, 18630, 18640, 18670, 18690, 18691, 18865, 18871.3, 18871.4, 18873, 18873.1, 18873.2, 18873.3, 18873.4, 18873.5, 18938.3, 18944.11 and 19990; and Government Code Section 12955.1.*

**Reference—***Health and Safety Code Sections 17000 through 17062.5, 17910 through 17995.5, 18200 through 18700, 18860 through 18874, and 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.*

### **SECTION 1.8.3 LOCAL ENFORCING AGENCY**

**1.8.3.1 Duties and powers.** *The building department of every city, county, or city and county, shall enforce all the provisions of law, this code, and the other rules and regulations promulgated by the Department of Housing and Community Development pertaining to the installation, erection, construction, reconstruction, movement, enlargement, conversion, alteration, repair, removal, demolition or arrangement of apartment houses, hotels, motels, lodging houses and dwellings, including accessory buildings, facilities and uses thereto.*

*The provisions regulating the erection and construction of dwellings and appurtenant structures shall not apply to existing structures as to which construction is commenced or approved prior to the effective date of these regulations. Requirements relating to use, maintenance and occupancy shall apply to all dwellings and appurtenant structures approved for construction or constructed before or after the effective date of this code.*

*For additional information regarding the use and occupancy of existing buildings and appurtenant structures, see California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, commencing with Article 1, Section 1.*

**1.8.3.2 Laws, rules and regulations.** *Other than the building standards contained in this code, and notwithstanding other provisions of law, the statutory authority and location of the laws, rules and regulations to be enforced by local enforcing agencies are listed by statute in Sections 1.8.3.2.1 through 1.8.3.2.5 below:*

**1.8.3.2.1 State Housing Law.** *Refer to the State Housing Law, California Health and Safety Code, Division 13, Part 1.5 commencing with Section 17910 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, commencing with Section 1, for the erection, construction, reconstruction, movement, enlargement, conversion, alteration, repair, removal, demolition or arrangement of apartment houses, hotels, motels, lodging*

*houses and dwellings, including accessory buildings, facilities and uses thereto.*

**1.8.3.2.2 Mobilehome Parks Act.** *Refer to the Mobilehome Parks Act, California Health and Safety Code, Division 13, Part 2.1, commencing with Section 18200 and California Code of Regulations, Title 25, Division 1, Chapter 2, commencing with Section 1000 for mobilehome park administrative and enforcement authority, permits, plans, fees, violations, inspections and penalties both within and outside mobilehome parks.*

**Exception:** *Mobilehome parks where the Department of Housing and Community Development is the enforcing agency.*

**1.8.3.2.3 Special Occupancy Parks Act.** *Refer to the Special Occupancy Parks Act, California Health and Safety Code, Division 13, Part 2.3, commencing with Section 18860 and California Code of Regulations, Title 25, Division 1, Chapter 2.2, commencing with Section 2000 for special occupancy park administrative and enforcement authority, permits, fees, violations, inspections and penalties both within and outside of special occupancy parks.*

**Exception:** *Special occupancy parks where the Department of Housing and Community Development is the enforcing agency.*

**1.8.3.2.4 Employee Housing Act.** *Refer to the Employee Housing Act, California Health and Safety Code, Division 13, Part 1, commencing with Section 17000 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 3, commencing with Section 600 for employee housing administrative and enforcement authority, permits, fees, violations, inspections and penalties.*

**1.8.3.2.5 Factory-Built Housing Law.** *Refer to the Factory-Built Housing Law, California Health and Safety Code, Division 13, Part 6 commencing with Section 19960 and California Code of Regulations, Title 25, Division 1, Chapter 3, Subchapter 1, commencing with Section 3000 for factory-built housing administrative and enforcement authority, permits, fees, violations, inspections and penalties.*

### **SECTION 1.8.4 PERMITS, FEES, APPLICATIONS AND INSPECTIONS**

**1.8.4.1 Permits.** *A written construction permit shall be obtained from the enforcing agency prior to the erection, construction, reconstruction, installation, moving or alteration of any building or structure.*

#### **Exceptions:**

1. *Work exempt from permits as specified in Chapter 1, Division II, Scope and Administration, Section 105.2.*
2. *Changes, alterations or repairs of a minor nature not affecting structural features, egress, sanitation, safety or accessibility as determined by the enforcing agency.*

*Exemptions from permit requirements shall not be deemed to grant authorization for any work to be done in any manner in violation of other provisions of law or this code.*

**1.8.4.2 Fees.** Subject to other provisions of law, the governing body of any city, county, or city and county, may prescribe fees to defray the cost of enforcement of rules and regulations promulgated by the Department of Housing and Community Development. The amount of the fees shall not exceed the amount reasonably necessary to administer or process permits, certificates, forms or other documents, or to defray the costs of enforcement. For additional information, see the State Housing Law, Health and Safety Code, Division 13, Part 1.5, Section 17951 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, Article 3, commencing with Section 6.

**1.8.4.3 Plan review and time limitations.** Subject to other provisions of law, provisions related to plan checking, prohibition of excessive delays and contracting with or employment of private parties to perform plan checking are set forth in the State Housing Law, Health and Safety Code Section 17960.1, and for employee housing, in Health and Safety Code Section 17021.

**1.8.4.3.1 Retention of plans.** The building department of every city, county, or city and county shall maintain an official copy, microfilm, electronic or other type of photographic copy of the plans of every building, during the life of the building, for which the department issued a building permit.

#### **Exceptions:**

1. Single or multiple dwellings not more than two stories and basement in height.
2. Garages and other structures appurtenant to buildings listed in Exception 1.
3. Farm or ranch buildings appurtenant to buildings listed in Exception 1.
4. Any one-story building where the span between bearing walls does not exceed 25 feet (7620 mm), except a steel frame or concrete building.

All plans for common interest developments as defined in Section 1351 of the California Civil Code shall be retained. For additional information regarding plan retention and reproduction of plans by an enforcing agency, see Health and Safety Code Sections 19850 through 19852.

**1.8.4.4 Inspections.** Construction or work for which a permit is required shall be subject to inspection by the building official and such construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or other regulations of the Department of Housing and Community Development. Required inspections are listed in Chapter 1, Division II, Scope and Administration, Sections 110.3.1 through 110.3.6, 110.3.8, 110.3.9 and 110.3.10.

## **SECTION 1.8.5**

### **RIGHT OF ENTRY FOR ENFORCEMENT**

**1.8.5.1 General.** Subject to other provisions of law, officers and agents of the enforcing agency may enter and inspect public and private properties to secure compliance with the rules and regulations promulgated by the Department of Housing and Community Development. For limitations and additional information regarding enforcement, see the following:

1. For applications subject to the State Housing Law as referenced in Section 1.8.3.2.1 of this code, refer to Health and Safety Code, Division 13, Part 1.5, commencing with Section 17910 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, commencing with Section 1.
2. For applications subject to the Mobilehome Parks Act as referenced in Section 1.8.3.2.2 of this code, refer to Health and Safety Code, Division 13, Part 2.1, commencing with Section 18200 and California Code of Regulations, Title 25, Division 1, Chapter 2, commencing with Section 1000.
3. For applications subject to the Special Occupancy Parks Act as referenced in Section 1.8.3.2.3 of this code, refer to Health and Safety Code, Division 13, Part 2.3, commencing with Section 18860 and California Code of Regulations, Title 25, Division 1, Chapter 2.2, commencing with Section 2000.
4. For applications subject to the Employee Housing Act as referenced in Section 1.8.3.2.4 of this code, refer to Health and Safety Code, Division 13, Part 1, commencing with Section 17000 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 3, commencing with Section 600.
5. For applications subject to the Factory-Built Housing Law as referenced in Section 1.8.3.2.5 of this code, refer to Health and Safety Code, Division 13, Part 6, commencing with Section 19960 and California Code of Regulations, Title 25, Division 1, Chapter 3, Subchapter 1, commencing with Section 3000.

## **SECTION 1.8.6**

### **LOCAL MODIFICATION BY ORDINANCE OR REGULATION**

**1.8.6.1 General.** Subject to other provisions of law, a city, county, or city and county may make changes to the provisions adopted by the Department of Housing and Community Development. If any city, county, or city and county does not amend, add or repeal by local ordinances or regulations the provisions published in this code or other regulations promulgated by the Department of Housing and Community Development, those provisions shall be applicable and shall become effective 180 days after publication by the California Building Standards Commission. Amendments, additions and deletions to this code adopted by a city, county, or city and county pursuant to California Health and Safety Code Sections 17958.5, 17958.7 and 18941.5, together with all applicable portions of this code, shall also become effective 180

days after publication of the California Building Standards Code by the California Building Standards Commission.

**1.8.6.2 Findings, filings and rejections of local modifications.** Prior to making any modifications or establishing more restrictive building standards, the governing body shall make express findings and filings, as required by California Health and Safety Code Section 17958.7, showing that such modifications are reasonably necessary due to local climatic, geological or topographical conditions. No modification shall become effective or operative unless the following requirements are met:

1. The express findings shall be made available as a public record.
2. A copy of the modification and express finding, each document marked to cross-reference the other, shall be filed with the California Building Standards Commission for a city, county, or city and county and with the Department of Housing and Community Development for fire protection districts.
3. The California Building Standards Commission has not rejected the modification or change.

Nothing in this section shall limit the authority of fire protection districts pursuant to California Health and Safety Code Section 13869.7(a).

## SECTION 1.8.7 ALTERNATE MATERIALS, DESIGNS, TESTS AND METHODS OF CONSTRUCTION

**1.8.7.1 General.** The provisions of this code, as adopted by the Department of Housing and Community Development, are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, design or method of construction not specifically prescribed by this code. Consideration and approval of alternates shall comply with Section 1.8.7.2 for local building departments and Section 1.8.7.3 for the Department of Housing and Community Development.

**1.8.7.2 Local building departments.** The building department of any city, county, or city and county may approve alternates for use in the erection, construction, reconstruction, movement, enlargement, conversion, alteration, repair, removal, demolition or arrangement of an apartment house, hotel, motel, lodging house, dwelling or an accessory structure, except for the following:

1. Structures located in mobilehome parks as defined in California Health and Safety Code Section 18214.
2. Structures located in special occupancy parks as defined in California Health and Safety Code Section 18862.43.
3. Factory-built housing as defined in California Health and Safety Code Section 19971.

**1.8.7.2.1 Approval of alternates.** The consideration and approval of alternates by a local building department shall comply with the following procedures and limitations:

1. The approval shall be granted on a case-by-case basis.

2. Evidence shall be submitted to substantiate claims that the proposed alternate, in performance, safety and protection of life and health, conforms to, or is at least equivalent to, the standards contained in this code and other rules and regulations promulgated by the Department of Housing and Community Development.

3. The local building department may require tests performed by an approved testing agency at the expense of the owner or owner's agent as proof of compliance.

4. If the proposed alternate is related to accessibility in covered multifamily dwellings or in facilities serving "COVERED MULTIFAMILY DWELLINGS" as defined in Chapter 11A, the proposed alternate must also meet the threshold set for "EQUIVALENT FACILITATION" as defined in Chapter 11A.

For additional information regarding approval of alternates by a building department pursuant to the State Housing Law, see California Health and Safety Code Section 17951(e) and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1.

**1.8.7.3 Department of Housing and Community Development.** The Department of Housing and Community Development may approve alternates for use in the erection, construction, reconstruction, movement, enlargement, conversion, alteration, repair, removal or demolition of an apartment house, hotel, motel, lodging house, dwelling or an accessory thereto and permanent buildings in mobilehome parks and special occupancy parks. The consideration and approval of alternates shall comply with the following:

1. The department may require tests at the expense of the owner or owner's agent to substantiate compliance with the California Building Standards Code.
2. The approved alternate shall, for its intended purpose, be at least equivalent in performance and safety to the materials, designs, tests or methods of construction prescribed by this code.

## SECTION 1.8.8 APPEALS BOARD

**1.8.8.1 General.** Every city, county, or city and county shall establish a process to hear and decide appeals of orders, decisions and determinations made by the enforcing agency relative to the application and interpretation of this code and other regulations governing use, maintenance and change of occupancy. The governing body of any city, county, or city and county may establish a local appeals board and a housing appeals board to serve this purpose. Members of the appeals board(s) shall not be employees of the enforcing agency and shall be knowledgeable in the applicable building codes, regulations and ordinances as determined by the governing body of the city, county, or city and county.

Where no such appeals boards or agencies have been established, the governing body of the city, county, or city and county shall serve as the local appeals board or housing appeals board as specified in California Health and Safety Code Sections 17920.5 and 17920.6.

**1.8.8.2 Definitions.** The following terms shall for the purposes of this section have the meaning shown.

**HOUSING APPEALS BOARD.** The board or agency of a city, county, or city and county which is authorized by the governing body of the city, county, or city and county to hear appeals regarding the requirements of the city, county, or city and county relating to the use, maintenance and change of occupancy of buildings and structures, including requirements governing alteration, additions, repair, demolition and moving. In any area in which there is no such board or agency, "Housing appeals board" means the local appeals board having jurisdiction over the area.

**LOCAL APPEALS BOARD.** The board or agency of a city, county, or city and county which is authorized by the governing body of the city, county, or city and county to hear appeals regarding the building requirements of the city, county, or city and county. In any area in which there is no such board or agency, "Local appeals board" means the governing body of the city, county, or city and county having jurisdiction over the area.

**1.8.8.3 Appeals.** Except as otherwise provided in law, any person, firm or corporation adversely affected by a decision, order or determination by a city, county, or city and county relating to the application of building standards published in the California Building Standards Code, or any other applicable rule or regulation adopted by the Department of Housing and Community Development, or any lawfully enacted ordinance by a city, county, or city and county, may appeal the issue for resolution to the local appeals board or housing appeals board as appropriate.

The local appeals board shall hear appeals relating to new building construction and the housing appeals board shall hear appeals relating to existing buildings.

## **SECTION 1.8.9 UNSAFE BUILDINGS OR STRUCTURES**

**1.8.9.1 Authority to enforce.** Subject to other provisions of law, the administration, enforcement, actions, proceedings, abatement, violations and penalties for unsafe buildings and structures are contained in the following statutes and regulations:

1. For applications subject to the State Housing Law as referenced in Section 1.8.3.2.1 of this code, refer to Health and Safety Code, Division 13, Part 1.5, commencing with Section 17910 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, commencing with Section 1.
2. For applications subject to the Mobilehome Parks Act as referenced in Section 1.8.3.2.2 of this code, refer to Health and Safety Code, Division 13, Part 2.1, commencing with Section 18200 and California Code of Regulations, Title 25, Division 1, Chapter 2, commencing with Section 1000.

mencing with Section 18200 and California Code of Regulations, Title 25, Division 1, Chapter 2, commencing with Section 1000.

3. For applications subject to the Special Occupancy Parks Act as referenced in Section 1.8.3.2.3 of this code, refer to Health and Safety Code, Division 13, Part 2.3, commencing with Section 18860 and California Code of Regulations, Title 25, Division 1, Chapter 2.2, commencing with Section 2000.

4. For applications subject to the Employee Housing Act as referenced in Section 1.8.3.2.4 of this code, refer to Health and Safety Code, Division 13, Part 1, commencing with Section 17000 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 3, commencing with Section 600.

5. For applications subject to the Factory-Built Housing Law as referenced in Section 1.8.3.2.5 of this code, refer to Health and Safety Code, Division 13, Part 6, commencing with Section 19960 and California Code of Regulations, Title 25, Division 1, Chapter 3, Subchapter 1, commencing with Section 3000.

**1.8.9.2 Actions and proceedings.** Subject to other provisions of law, punishments, penalties and fines for violations of building standards are contained in the following statutes and regulations:

1. For applications subject to the State Housing Law as referenced in Section 1.8.3.2.1 of this code, refer to Health and Safety Code, Division 13, Part 1.5, commencing with Section 17910 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 1, commencing with Section 1.
2. For applications subject to the Mobilehome Parks Act as referenced in Section 1.8.3.2.2 of this code, refer to Health and Safety Code, Division 13, Part 2.1, commencing with Section 18200 and California Code of Regulations, Title 25, Division 1, Chapter 2, commencing with Section 1000.
3. For applications subject to the Special Occupancy Parks Act as referenced in Section 1.8.3.2.3 of this code, refer to Health and Safety Code, Division 13, Part 2.3, commencing with Section 18860 and California Code of Regulations, Title 25, Division 1, Chapter 2.2, commencing with Section 2000.
4. For applications subject to the Employee Housing Act as referenced in Section 1.8.3.2.4 of this code, refer to Health and Safety Code, Division 13, Part 1, commencing with Section 17000 and California Code of Regulations, Title 25, Division 1, Chapter 1, Subchapter 3, commencing with Section 600.
5. For applications subject to the Factory-Built Housing Law as referenced in Section 1.8.3.2.5 of this code, refer to Health and Safety Code, Division 13, Part 6, commencing with Section 19960 and California Code of Regulations, Title 25, Division 1, Chapter 3, Subchapter 1, commencing with Section 3000.

## SECTION 1.8.10 OTHER BUILDING REGULATIONS

**1.8.10.1 Existing structures.** Subject to the requirements of California Health and Safety Code Sections 17912, 17920.3, 17922, 17922.3, 17958.8 and 17958.9, the provisions contained in Chapter 34 relating to existing structures shall only apply as identified in the Matrix Adoption Table under the authority of the Department of Housing and Community Development as listed in Sections 1.8.2.1.1 through 1.8.2.1.3 of this code.

**1.8.10.2 Moved structures.** Subject to the requirements of California Health and Safety Code Sections 17922.3 and 17958.9, the provisions contained in Chapter 34 relating to a moved residential structure shall only apply as identified in the Matrix Adoption Table under the authority of the Department of Housing and Community Development as listed in Sections 1.8.2.1.1 through 1.8.2.1.3 of this code.

## SECTION 1.9 DIVISION OF THE STATE ARCHITECT

### 1.9.1 Division of the State Architect—Access Compliance.

**General.** The purpose of this code is to ensure that barrier-free design is incorporated in all buildings, facilities, site work and other improvements to which this code applies in compliance with state law to ensure that these improvements are accessible to and usable by persons with disabilities. Additions, alterations and structural repairs in all buildings and facilities shall comply with these provisions for new buildings, except as otherwise provided and specified herein.

The provisions of these regulations shall apply to any portable buildings leased or owned by a school district, and shall also apply to temporary and emergency buildings and facilities. Temporary buildings and facilities are not of permanent construction but are extensively used or are essential for public use for a period of time. Examples of temporary buildings or facilities covered include, but are not limited to: reviewing stands, temporary classrooms, bleacher areas, exhibit areas, temporary banking facilities, temporary health screening services or temporary safe pedestrian passageways around a construction site.

In addition, to incorporate standards at least as restrictive as those required by the federal government for barrier-free design under (1) Title III (Public Accommodations and Commercial Facilities), Subpart D (New Construction and Alteration) (see 28 C.F.R., Part 36), and (2) Title II (Public Entities), Section 35.151 (New Construction and Alterations) (see 28 C.F.R., Part 35) both from the Americans with Disabilities Act of 1990, 2004 Americans with Disabilities Act Accessibility Guidelines, as adopted by the U.S. Department of Justice (see 36 C.F.R. Part 1191, Appendices B and D), and (3) under the Fair Housing Amendments Act of 1988. Some of these regulations may be more stringent than state law in order to meet the federal requirement.

**1.9.1.1 Application.** See Government Code commencing with Section 4450.

Publicly funded buildings, structures, sidewalks, curbs and related facilities shall be accessible to and usable by persons with disabilities as follows:

**1.9.1.1.1** All buildings, structures, sidewalks, curbs and related facilities constructed in the state by the use of state, county or municipal funds, or the funds of any political subdivision of the state.

**1.9.1.1.2** All buildings, structures and facilities that are leased, rented, contracted, sublet or hired by any municipal, county or state division of government, or by a special district.

**1.9.1.1.3** All publicly funded buildings used for congregate residences or for one- or two-family dwelling unit purposes shall conform to the provisions applicable to living accommodations.

**1.9.1.1.4** All existing publicly funded buildings and facilities when alterations, structural repairs or additions are made to such buildings or facilities. For detailed requirements on existing buildings, see Chapter 11B, Division 2, Section 11B-202.

**1.9.1.1.5** With respect to buildings, structures, sidewalks, curbs and related facilities not requiring a building permit, building standards published in the California Building Standards Code relating to access for persons with disabilities and other regulations adopted pursuant to Government Code Section 4450, and in effect at the time construction is commenced, shall be applicable.

**1.9.1.2 Application.** See Health and Safety Code commencing with Section 19952.

All privately funded public accommodations, as defined and commercial facilities, as defined, shall be accessible to persons with disabilities as follows:

**Exception:** Certain types of privately funded multistory buildings do not require installation of an elevator to provide access above and below the first floor. See Chapter 11B.

**1.9.1.2.1** Any building, structure, facility, complex or improved area, or portions thereof, which are used by the general public.

**1.9.1.2.2** Any sanitary facilities which are made available for the public, clients or employees in such accommodations or facilities.

**1.9.1.2.3** Any curb or sidewalk intended for public use that is constructed in this state with private funds.

**1.9.1.2.4** All existing privately funded public accommodations when alterations, structural repairs or additions are made to such public accommodations as set forth under Chapter 11B.

**1.9.1.3 Application—Public housing and private housing available for public use.** See Government Code Sections 4450 and 12955.1(c).

**1.9.1.4 Enforcing agency.**

**1.9.1.4.1** The director of the Department of General Services where state funds are utilized for any project

or where funds of counties, municipalities or other political subdivisions are utilized for the construction of elementary, secondary or community college projects.

**1.9.1.4.2** The governing bodies where funds of counties, municipalities or other political subdivisions are utilized except as otherwise provided above.

**1.9.1.4.3** The building department of every city, county or city and county within the territorial area of its city, county or city and county, where private funds are utilized. "Building department" means the department, bureau or officer charged with the enforcement of laws or ordinances regulating the erection or construction, or both the erection and construction, of buildings.

**1.9.1.5** Special conditions for persons with disabilities requiring appeals action ratification. Whenever reference is made in these regulations to this section, the findings and determinations required to be rendered by the local enforcing agency shall be subject to ratification through an appeals process.

**1.9.1.6 Authority cited**—Government Code Section 4450.

**1.9.1.7 Reference cited**—Government Code Sections 4450 through 4461 and 12955.1(c) and Health and Safety Code Sections 18949.1, 19952 through 19959.

**1.9.1.8 Adopting agency identification.** The provisions of this code applicable to buildings identified in this Subsection 1.9.1 will be identified in the Matrix Adoption Tables under the acronym DSA-AC.

## 1.9.2 Division of the State Architect—Structural Safety.

### 1.9.2.1 DSA-SS Division of the State Architect-Structural Safety.

**Application**—Public elementary and secondary schools, community colleges and state-owned or state-leased essential services buildings.

**Enforcing agency**—The Division of the State Architect—Structural Safety (DSA-SS) has been delegated the responsibility and authority by the Department of General Services to review and approve the design and observe the construction of public elementary and secondary schools, community colleges and state-owned or state-leased essential services buildings.

**Authority cited**—Education Code Sections 17310 and 81142 and Health and Safety Code Section 16022.

**Reference**—Education Code Sections 17280 through 17317, and 81130 through 81147 and Health and Safety Code Sections 16000 through 16023.

#### 1.9.2.1.1 Applicable administrative standards.

##### 1. Title 24, Part 1, California Code of Regulations:

- 1.1. Sections 4-301 through 4-355, Group 1, Chapter 4, for public elementary and secondary schools and community colleges.
- 1.2. Sections 4-201 through 4-249, Chapter 4, for state-owned or state-leased essential services buildings.

**2. Title 24, Part 2, California Code of Regulations:** [applies to public elementary and secondary schools, community colleges and state-owned or state-leased essential services building(s):]

- 2.1. Sections 1.1 and 1.9.2.1 of Chapter 1, Division I.
- 2.2. Sections 102.1, 102.2, 102.3, 102.4, 102.5, 104.9, 104.10 104.11 and 106.1 of Chapter 1, Division II.

**1.9.2.1.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 6, 9, 11 and 12, California Code of Regulations, for school buildings, community colleges and state-owned or state-leased essential service buildings.

The provisions of Title 24, Part 2, as adopted and amended by the Division of the State Architect—Structural Safety, shall apply to the applications listed in Section 1.9.2.1.

The Division of the State Architect—Structural Safety adopts the following building standards in Title 24, Part 2:

Chapters 2 through 10, 12, 14, 15, 16A, 17A, 18A, 19A, 20, 21A, 22A, 23, 24, 25, 26, 30, 31, 32, 33, 34, 35, and Appendix J.

**1.9.2.1.3 Amendments.** Division of the State Architect—Structural Safety amendments in this code appear preceded with the acronym [DSA-SS].

#### Exceptions:

1. Chapters 16A, 17A, 18A, 19A, 21A, and 22A—Amendments appearing in these chapters without an acronym have been co-adopted by DSA-SS and OSHPD.
2. Chapter 34, Sections 3417-3423—DSA-SS adopts these sections without the use of the DSA-SS acronym.

**1.9.2.1.4 Reference to other chapters.** Where reference is made within this code to sections in Chapters 16, 17, 18, 19, 21, and 22, the respective sections in Chapters 16A, 17A, 18A, 19A, 21A, and 22A shall apply instead.

### 1.9.2.2 DSA-SS/CC Division of the State Architect-Structural Safety/Community Colleges

**Application**—Community Colleges. The Division of the State Architect has been delegated the authority by the Department of General Services to promulgate alternate building standards for application to community colleges, which a community college may elect to use in lieu of standards promulgated by DSA-SS in accordance with Section 1.9.2.1.

**Enforcing agency**—Division of the State Architect—Structural Safety/Community Colleges (DSA-SS/CC)

The Division of the State Architect has been delegated the authority by the Department of General Services to review and approve the design and oversee construction of community colleges electing to use the

alternative building standards as provided in this section.

**Authority cited**—Education Code Section 81053.

**Reference**—Education Code Sections 81052, 81053, and 81130 through 81147.

#### 1.9.2.2.1 Applicable administrative standards.

##### 1. Title 24, Part 1, California Code of Regulations:

- 1.1. Sections 4-301 through 4-355, Group 1, Chapter 4.

##### 2. Title 24, Part 2, California Code of Regulations:

- 2.1. Sections 1.1 and 1.9.2 of Chapter 1, Division I.
- 2.2. Sections 102.1, 102.2, 102.3, 102.4, 102.5, 104.9, 104.10, 104.11, and 106.1 of Chapter 1, Division II.

**1.9.2.2.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 6, 9, 11, and 12, California Code of Regulations.

The Division of the State Architect-Structural Safety/Community Colleges [DSA-SS/CC] adopts the following building standards in Title 24, Part 2:

Chapters 2 through 10, 12, 14, 15, 16, 17A, 18A, 19, 20, 21, 22, 23, 24, 25, 26, 30, 31, 32, 33, 34, 35, and Appendix J.

**1.9.2.2.3 Amendments.** Division of the State Architect—Structural Safety/Community Colleges amendments in this code appear preceded with the acronym [DSA-SS/CC].

#### Exceptions:

1. Chapters 17A, and 18A—Amendments appearing in these chapters without an acronym have been co-adopted by DSA-SS, DSA-SS/CC, and OSHPD.
2. Chapter 34, Sections 3417-3423—DSA-SS/CC adopts these sections without the use of the DSA-SS/CC acronym.

**1.9.2.2.4 Reference to other chapters.** Where reference is made within this code to sections in Chapters 17 and 18, the respective sections in Chapters 17A and 18A shall apply instead.

## SECTION 1.10 OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

**1.10.1 OSHPD 1.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—General acute care hospitals and acute psychiatric hospitals, excluding distinct part units or distinct part freestanding buildings providing skilled nursing or intermediate care services. For structural regulations: Skilled nursing facilities and/or intermediate care facil-

ties except those skilled nursing facilities and intermediate care facilities of single-story, Type V, wood or light steel-frame construction.

**Enforcing agency**—Office of Statewide Health Planning and Development (OSHPD). The office shall enforce the Division of the State Architect—Access Compliance regulations and the regulations of the Office of the State Fire Marshal for the above stated facility types.

#### 1.10.1.1 Applicable administrative standards.

##### 1. Title 24, Part 1, California Code of Regulations: Chapters 6 and 7.

##### 2. Title 24, Part 2, California Code of Regulations: Sections 1.1 and 1.10, Chapter 1, Division I, and Sections 101–105.1.2, portions of Section 105.2 as indicated in the adoption matrix and Sections 105.3–116, Chapter 1, Division II.

**1.10.1.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 9 and 11.

The provisions of Title 24, Part 2, as adopted and amended by OSHPD, shall apply to the applications listed in Section 1.10.1.

OSHPD 1 adopts the following building standards in Title 24, Part 2:

Chapters 2 through 10, 12, 14, 15, 16A, 17A, 18A, 19A, 20, 21A, 22A, 23, 24, 25, 26, 30, 31, 32, 33, 34A, 35, Appendix J and Appendix L.

**1.10.1.3 Identification of amendments.** For applications listed in Section 1.10.1, amendments appear in this code preceded with the acronym [OSHPD 1], unless the entire chapter is applicable.

**1.10.1.4 Reference to other chapters.** Where reference is made within this code to sections in Chapters 16, 17, 18, 19, 21, 22 and 34, the respective sections in Chapters 16A, 17A, 18A, 19A, 21A, 22A and 34A shall apply instead.

**Authority**—Health and Safety Code Sections 127010, 127015, 1275 and 129850.

**References**—Health and Safety Code Sections 19958, 127010, 127015, 129680, 1275 and 129675 through 130070.

**1.10.2 OSHPD 2.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—Skilled nursing facilities and intermediate care facilities, including distinct part skilled nursing and intermediate care services on a general acute care or acute psychiatric hospital license, provided either are in a separate unit or a freestanding building. For structural regulations: Single-story, Type V skilled nursing facility and/or intermediate care facilities utilizing wood or light steel-frame construction.

**Enforcing agency**—Office of Statewide Health Planning and Development (OSHPD). The office shall also enforce the Division of the State Architect—Access Compliance

*regulations and the regulations of the Office of the State Fire Marshal for the above-stated facility type.*

#### **1.10.2.1 Applicable administrative standards.**

1. Title 24, Part 1, California Code of Regulations: Chapter 7.
2. Title 24, Part 2, California Code of Regulations: Sections 1.1 and 1.10, Chapter 1, Division I, and Sections 101–103, portions of Section 104 and 105 as indicated in the adoption matrix and Sections 106–116, Chapter 1, Division II.

#### **1.10.2.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 9, and 11.

*The provisions of Title 24, Part 2, as adopted and amended by OSHPD, shall apply to the applications listed in Section 1.10.2.*

*OSHPD 2 adopts the following building standards in Title 24, Part 2:*

*Chapters 2 through 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 30, 31, 32, 33, 34, 35, Appendices J and L.*

#### **1.10.2.3 Identification of amendments.** For applications listed in Section 1.10.2, amendments appear in this code preceded with the acronym [OSHPD 2].

**Authority**—Health and Safety Code Sections 127010, 127015, 1275 and 129850.

**References**—Health and Safety Code Sections 127010, 127015, 1275 and 129680.

#### **1.10.3 OSHPD 3.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—Licensed clinics and any freestanding building under a hospital license where outpatient clinical services are provided.

**Enforcing agency**—Local building department.

#### **1.10.3.1 Applicable administrative standards.**

1. Title 24, Part 1, California Code of Regulations: Chapter 7.
2. Title 24, Part 2, California Code of Regulations: Sections 1.1 and 1.10, Chapter 1, Division I, and portions of Section 101 as adopted, Sections 102–103, portions of Sections 104–107 as indicated in the adoption matrix, and Sections 108–116, Chapter 1, Division II.

#### **1.10.3.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 6, 9, and 11.

*The provisions of Title 24, Part 2, as adopted and amended by OSHPD, shall apply to the applications listed in Section 1.10.3.*

*OSHPD 3 adopts the following building standards in Title 24, Part 2:*

*Chapter 12.*

**1.10.3.3 Identification of amendments.** For applications listed in Section 1.10.3, amendments appear in this code without the acronym [OSHPD 3]. Adoptions are shown in the adoption matrix.

**Authority**—Health and Safety Code Sections 127010, 127015 and 1226.

**References**—Health and Safety Code Sections 127010, 127015, 129885 and 1226, Government Code Section 54350 and State Constitution Article 11, Section 7.

#### **1.10.4 OSHPD 4.** Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application**—Correctional treatment centers.

**Enforcing agency**—Office of Statewide Health Planning and Development (OSHPD). The office shall also enforce the Division of the State Architect—Access Compliance regulations and the regulations of the Office of the State Fire Marshal for the above-stated facility types.

#### **1.10.4.1 Applicable administrative standards.**

1. Title 24, Part 1, California Code of Regulations: Chapter 7.
2. Title 24, Part 2, California Code of Regulations: Sections 1.1 and 1.10, Chapter 1, Division I, and Sections 101–105.1.2, portions of Section 105.2 as indicated in the adoption matrix and Sections 105.3–116, Chapter 1, Division II.

#### **1.10.4.2 Applicable building standards.** California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 9, and 11.

*The provisions of Title 24, Part 2, as adopted and amended by OSHPD, shall apply to the applications listed in Section 1.10.4.*

*OSHPD 4 adopts the following building standards in Title 24, Part 2:*

*Chapters 2 through 10, 12, 14, 15, 16A, 17A, 18A, 19A, 20, 21A, 22A, 23, 24, 25, 26, 30, 31, 32, 33, 34A, 35 and Appendices J and L.*

**1.10.4.3 Identification of amendments.** For applications listed in Section 1.10.4, amendments appear in this code preceded with the acronym [OSHPD 4], unless the entire chapter is applicable.

**1.10.4.4 Reference to other chapters.** Where reference is made within this code to sections in Chapters 16, 17, 18, 19, 21, 22 and 34, the respective sections in Chapters 16A, 17A, 18A, 19A, 21A, 22A and 34A shall apply instead.

**Authority**—Health and Safety Code Sections 127010, 127015 and 129790.

**References**—Health and Safety Code Sections 127010, 127015, 1275 and 129675 through 130070.

## **SECTION 1.11 OFFICE OF THE STATE FIRE MARSHAL**

**1.11.1 SFM—Office of the State Fire Marshal.** Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application:**

**Institutional, educational or any similar occupancy.** Any building or structure used or intended for use as an asylum, jail, mental hospital, hospital, sanitarium, home for the aged, children's nursery, children's home, school or any similar occupancy of any capacity.

**Authority cited**—Health and Safety Code Section 13143.

**Reference**—Health and Safety Code Section 13143.

**Assembly or similar place of assemblage.** Any theater, dancehall, skating rink, auditorium, assembly hall, meeting hall, nightclub, fair building or similar place of assemblage where 50 or more persons may gather together in a building, room or structure for the purpose of amusement, entertainment, instruction, deliberation, worship, drinking or dining, awaiting transportation, or education.

**Authority cited**—Health and Safety Code Section 13143.

**Reference**—Health and Safety Code Section 13143.

**Small family day-care homes.**

**Authority cited**—Health and Safety Code Sections 1597.45, 1597.54, 13143 and 17921.

**Reference**—Health and Safety Code Section 13143.

**Large family day-care homes.**

**Authority cited**—Health and Safety Code Sections 1597.46, 1597.54 and 17921.

**Reference**—Health and Safety Code Section 13143.

**Residential facilities and residential facilities for the elderly.**

**Authority cited**—Health and Safety Code Section 13133.

**Reference**—Health and Safety Code Section 13143.

**Any state institution or other state-owned or state-occupied building.**

**Authority cited**—Health and Safety Code Section 13108.

**Reference**—Health and Safety Code Section 13143.

**High-Rise structures.**

**Authority cited**—Health and Safety Code Section 13211.

**Reference**—Health and Safety Code Section 13143.

**Motion picture production studios.**

**Authority cited**—Health and Safety Code Section 13143.1.

**Reference**—Health and Safety Code Section 13143.

**Organized camps.**

**Authority cited**—Health and Safety Code Section 18897.3.

**Reference**—Health and Safety Code Section 13143.

**Residential.** All hotels, motels, lodging houses, apartment houses and dwellings, including congregate residences and buildings and structures accessory thereto.

Multiple-story structures existing on January 1, 1975, let for human habitation, including and limited to, hotels, motels and apartment houses, less than 75 feet (22 860 mm) above the lowest floor level having building access, wherein rooms used for sleeping are let above the ground floor.

**Authority cited**—Health and Safety Code Sections 13143.2 and 17921.

**Reference**—Health and Safety Code Section 13143.

**Residential care facilities.** Certified family care homes, out-of-home placement facilities, halfway houses, drug and/or alcohol rehabilitation facilities and any building or structure used or intended for use as a home or institution for the housing of any person of any age when such person is referred to or placed within such home or institution for protective social care and supervision services by any governmental agency.

**Authority cited**—Health and Safety Code Section 13143.6.

**Reference**—Health and Safety Code Section 13143.

**Tents, awnings or other fabric enclosures used in connection with any occupancy.**

**Authority cited**—Health and Safety Code Section 13116.

**Reference**—Health and Safety Code Section 13143.

**Fire alarm devices, equipment and systems in connection with any occupancy.**

**Authority cited**—Health and Safety Code Section 13114.

**Reference**—Health and Safety Code Section 13143.

**Hazardous materials.**

**Authority cited**—Health and Safety Code Section 13143.9.

**Reference**—Health and Safety Code Section 13143.

**Flammable and combustible liquids.**

**Authority cited**—Health and Safety Code Section 13143.6.

**Reference**—Health and Safety Code Section 13143.

**Public School Automatic Fire Detection, Alarm and Sprinkler Systems.**

**Authority cited**—Health and Safety Code Section 13143 and California Education Code Article 7.5, Sections 17074.50, 17074.52 and 17074.54.

**Reference**—Government Code Section 11152.5, Health and Safety Code Section 13143 and California Education Code Chapter 12.5, Leroy F. Greene School Facilities Act of 1998, Article 1.

**Wildland-Urban Interface Fire Area.**

**Authority cited**—Health and Safety Code Sections 13143, 13108.5(a) and 18949.2(b) and (c) and Government Code Section 51189.

**Reference**—Health and Safety Code Sections 13143, Government Code Sections 51176, 51177, 51178 and 51179 and Public Resources Code Sections 4201 through 4204.

**1.11.1.1 Adopting agency identification.** The provisions of this code applicable to buildings identified in this Sub-section 1.11.1 will be identified in the Matrix Adoption Tables under the acronym SFM.

**1.11.2 Duties and powers of the enforcing agency.**

**1.11.2.1 Enforcement.**

**1.11.2.1.1** The responsibility for enforcement of building standards adopted by the State Fire Marshal and published in the California Building Standards Code relating to fire and panic safety and other regulations of the State Fire Marshal shall, except as provided in Section 1.11.2.1.2, be as follows:

1. The city, county or city and county with jurisdiction in the area affected by the standard or regulation shall delegate the enforcement of the building standards relating to fire and panic safety and other regulations of the State Fire Marshal as they relate to Group R-3 occupancies, as described in Section 310.1 of Part 2 of the California Building Standards Code, to either of the following:
  - 1.1. The chief of the fire authority of the city, county or city and county, or an authorized representative.
  - 1.2. The chief building official of the city, county or city and county, or an authorized representative.
2. The chief of any city or county fire department or of any fire protection district, and authorized representatives, shall enforce within the jurisdiction the building standards and other regulations of the State Fire Marshal, except those described in Item 1 or 4.
3. The State Fire Marshal shall have authority to enforce the building standards and other regulations of the State Fire Marshal in areas outside of corporate cities and districts providing fire protection services.
4. The State Fire Marshal shall have authority to enforce the building standards and other regulations of the State Fire Marshal in corporate cities and districts providing fire protection services on request of the chief fire official or the governing body.
5. Any fee charged pursuant to the enforcement authority of this section shall not exceed the estimated reasonable cost of providing the service for which the fee is charged pursuant to Section 66014 of the Government Code.

**1.11.2.1.2** Pursuant to Health and Safety Code Section 13108, and except as otherwise provided in this section, building standards adopted by the State Fire Marshal published in the California Building Standards

Code relating to fire and panic safety shall be enforced by the State Fire Marshal in all state-owned buildings, state-occupied buildings, and state institutions throughout the state. Upon the written request of the chief fire official of any city, county or fire protection district, the State Fire Marshal may authorize such chief fire official and his or her authorized representatives, in their geographical area of responsibility, to make fire prevention inspections of state-owned or state-occupied buildings, other than state institutions, for the purpose of enforcing the regulations relating to fire and panic safety adopted by the State Fire Marshal pursuant to this section and building standards relating to fire and panic safety published in the California Building Standards Code. Authorization from the State Fire Marshal shall be limited to those fire departments or fire districts which maintain a fire prevention bureau staffed by paid personnel.

Pursuant to Health and Safety Code Section 13108, any requirement or order made by any chief fire official who is authorized by the State Fire Marshal to make fire prevention inspections of state-owned or state-occupied buildings, other than state institutions, may be appealed to the State Fire Marshal. The State Fire Marshal shall, upon receiving an appeal and subject to the provisions of Chapter 5 (commencing with Section 18945) of Part 2.5 of Division 13 of the Health and Safety Code, determine if the requirement or order made is reasonably consistent with the fire and panic safety regulations adopted by the State Fire Marshal and building standards relating to fire and panic safety published in the California Building Code.

Any person may request a code interpretation from the State Fire Marshal relative to the intent of any regulation or provision adopted by the State Fire Marshal. When the request relates to a specific project, occupancy or building, the State Fire Marshal shall review the issue with the appropriate local enforcing agency prior to rendering such code interpretation.

**1.11.2.1.3** Pursuant to Health and Safety Code Section 13112, any person who violates any order, rule or regulation of the State Fire Marshal is guilty of a misdemeanor punishable by a fine of not less than \$100.00 or more than \$500.00, or by imprisonment for not less than six months, or by both. A person is guilty of a separate offense each day during which he or she commits, continues or permits a violation of any provision of, or any order, rule or regulation of, the State Fire Marshal as contained in this code.

Any inspection authority who, in the exercise of his or her authority as a deputy State Fire Marshal, causes any legal complaints to be filed or any arrest to be made shall notify the State Fire Marshal immediately following such action.

**1.11.2.2 Right of entry.** The fire chief of any city, county or fire protection district, or such person's authorized representative, may enter any state institution or any other state-owned or state-occupied building for the purpose of preparing a fire suppression preplanning program or for

*the purpose of investigating any fire in a state-occupied building.*

*The State Fire Marshal, his or her deputies or salaried assistants, the chief of any city or county fire department or fire protection district and his or her authorized representatives may enter any building or premises not used for dwelling purposes at any reasonable hour for the purpose of enforcing this chapter. The owner, lessee, manager or operator of any such building or premises shall permit the State Fire Marshal, his or her deputies or salaried assistants and the chief of any city or county fire department or fire protection district and his or her authorized representatives to enter and inspect them at the time and for the purpose stated in this section.*

**1.11.2.3 More restrictive fire and panic safety building standards.**

**1.11.2.3.1** Any fire protection district organized pursuant to Health and Safety Code Part 2.7 (commencing with Section 13800) of Division 12 may adopt building standards relating to fire and panic safety that are more stringent than those building standards adopted by the State Fire Marshal and contained in the California Building Standards Code. For these purposes, the district board shall be deemed a legislative body and the district shall be deemed a local agency. Any changes or modifications that are more stringent than the requirements published in the California Building Standards Code relating to fire and panic safety shall be subject to Section 1.1.8.1.

**1.11.2.3.2** Any fire protection district that proposes to adopt an ordinance pursuant to this section shall, not less than 30 days prior to noticing a proposed ordinance for public hearing, provide a copy of that ordinance, together with the adopted findings made pursuant to Section 1.11.2.3.1, to the city, county, or city and county where the ordinance will apply. The city, county, or city and county may provide the district with written comments, which shall become part of the fire protection district's public hearing record.

**1.11.2.3.3** The fire protection district shall transmit the adopted ordinance to the city, county, or city and county where the ordinance will apply. The legislative body of the city, county, or city and county may ratify, modify or deny an adopted ordinance and transmit its determination to the district within 15 days of the determination. Any modification or denial of an adopted ordinance shall include a written statement describing the reasons for any modifications or denial. No ordinance adopted by the district shall be effective until ratification by the city, county, or city and county where the ordinance will apply. Upon ratification of an adopted ordinance, the city, county or city and county shall file a copy of the findings of the district, and any findings of the city, county, or city and county, together with the adopted ordinance expressly marked and identified to which each finding refers, in accordance with Section 1.1.8.1(3).

**1.11.2.4 Request for alternate means of protection.** Requests for approval to use an alternative material, assembly or materials, equipment, method of construction, method of installation of equipment or means of protection shall be made in writing to the enforcing agency by the owner or the owner's authorized representative and shall be accompanied by a full statement of the conditions. Sufficient evidence or proof shall be submitted to substantiate any claim that may be made regarding its conformance. The enforcing agency may require tests and the submission of a test report from an approved testing organization as set forth in Title 19, California Code of Regulation, to substantiate the equivalency of the proposed alternative means of protection.

When a request for alternate means of protection involves hazardous materials, the authority having jurisdiction may consider implementation of the findings and recommendations identified in a Risk Management Plan (RMP) developed in accordance with Title 19, Division 2, Chapter 4.5, Article 3.

Approval of a request for use of an alternative material, assembly of materials, equipment, method of construction, method of installation of equipment or means of protection made pursuant to these provisions shall be limited to the particular case covered by request and shall not be construed as establishing any precedent for any future request.

**1.11.2.5 Appeals.** When a request for an alternate means of protection has been denied by the enforcing agency, the applicant may file a written appeal to the State Fire Marshal for consideration of the applicant's proposal. In considering such appeal, the State Fire Marshal may seek the advice of the State Board of Fire Services. The State Fire Marshal shall, after considering all of the facts presented, including any recommendations of the State Board of Fire Services, determine if the proposal is for the purposes intended, at least equivalent to that specified in these regulations in quality, strength, effectiveness, fire resistance, durability and safety, and shall transmit such findings and any recommendations to the applicant and to the enforcing agency.

**1.11.3 Construction documents.**

**1.11.3.1 Public schools.** Plans and specifications for the construction, alteration or addition to any building owned, leased or rented by any public school district shall be submitted to the Division of the State Architect.

**1.11.3.2 Movable walls and partitions.** Plans or diagrams shall be submitted to the enforcing agency for approval before the installation of, or rearrangement of, any movable wall or partition in any occupancy. Approval shall be granted only if there is no increase in the fire hazard.

**1.11.3.3 New construction high-rise buildings.**

1. Complete plans or specifications, or both, shall be prepared covering all work required to comply with new construction high-rise buildings. Such plans and specifications shall be submitted to the enforcing agency having jurisdiction.

2. All plans and specifications shall be prepared under the responsible charge of an architect or a civil or structural engineer authorized by law to develop construction plans and specifications, or by both such architect and engineer. Plans and specifications shall be prepared by an engineer duly qualified in that branch of engineering necessary to perform such services. Administration of the work of construction shall be under the charge of the responsible architect or engineer except that where plans and specifications involve alterations or repairs, such work of construction may be administered by an engineer duly qualified to perform such services and holding a valid certificate under Chapter 7 (commencing with Section 65700) of Division 3 of the Business and Professions Code for performance of services in that branch of engineering in which said plans, specifications and estimates and work of construction are applicable.

*This section shall not be construed as preventing the design of fire-extinguishing systems by persons holding a C-16 license issued pursuant to Division 3, Chapter 9, Business and Professions Code. In such instances, however, the responsibility charge of this section shall prevail.*

#### **1.11.3.4 Existing high-rise buildings.**

1. Complete plans or specifications, or both, shall be prepared covering all work required by Section 3412 for existing high-rise buildings. Such plans or specifications shall be submitted to the enforcing agency having jurisdiction.
2. When new construction is required to conform with the provisions of these regulations, complete plans or specifications, or both, shall be prepared in accordance with the provisions of this subsection. As used in this section, "new construction" is not intended to include repairs, replacements or minor alterations which do not disrupt or appreciably add to or affect the structural aspects of the building.

**1.11.3.5 Retention of plans.** Refer to Building Standards Law, Health and Safety Code Sections 19850 and 19851 for permanent retention of plans.

#### **1.11.4 Fees.**

**1.11.4.1 Other fees.** Pursuant to Health and Safety Code Section 13146.2, a city, county or district which inspects a hotel, motel, lodging house or apartment house may charge and collect a fee for the inspection from the owner of the structure in an amount, as determined by the city, county or district, sufficient to pay its costs of that inspection.

**1.11.4.2 Large family day-care.** Pursuant to Health and Safety Code Section 1597.46, Large Family Day-Care Homes, the local government shall process any required permit as economically as possible, and fees charged for review shall not exceed the costs of the review and permit process.

**1.11.4.3 High-Rise.** Pursuant to Health and Safety Code Section 13217, High-Rise Structure Inspection: Fees and costs, a local agency which inspects a high-rise structure

pursuant to Health and Safety Code Section 13217 may charge and collect a fee for the inspection from the owner of the high-rise structure in an amount, as determined by the local agency, sufficient to pay its costs of that inspection.

**1.11.4.4 Fire clearance preinspection.** Pursuant to Health and Safety Code Section 13235, Fire Clearance Preinspection, fee, upon receipt of a request from a prospective licensee of a community care facility, as defined in Section 1502, of a residential care facility for the elderly, as defined in Section 1569.2, or of a child day care facility, as defined in Section 1596.750, the local fire enforcing agency, as defined in Section 13244, or State Fire Marshal, whichever has primary jurisdiction, shall conduct a preinspection of the facility prior to the final fire clearance approval. At the time of the preinspection, the primary fire enforcing agency shall price consultation and interpretation of the fire safety regulations and shall notify the prospective licensee of the facility in writing of the specific fire safety regulations which shall be enforced in order to obtain fire clearance approval. A fee equal to, but not exceeding, the actual cost of the preinspection may be charged for the preinspection of a facility with a capacity to serve 25 or fewer persons. A fee equal to, but not exceeding, the actual cost of the preinspection may be charged for a preinspection of a facility with a capacity to serve 26 or more persons.

**1.11.4.5 Care facilities.** The primary fire enforcing agency shall complete the final fire clearance inspection for a community care facility, residential care facility for the elderly, or child day care facility within 30 days of receipt of the request for the final inspection, or as of the date the prospective facility requests the final prelicensure inspection by the State Department of Social Services, whichever is later.

Pursuant to Health and Safety Code Section 13235, a preinspection fee equal to, but not exceeding, the actual cost of the preinspection may be charged for a facility with a capacity to serve 25 or less clients. A fee equal to, but not exceeding, the actual cost of the preinspection may be charged for a preinspection of a facility with a capacity to serve 26 or more clients.

Pursuant to Health and Safety Code Section 13131.5, a reasonable final inspection fee, not to exceed the actual cost of inspection services necessary to complete a final inspection may be charged for occupancies classified as residential care facilities for the elderly (RCFE).

Pursuant to Health and Safety Code Section 1569.84, neither the State Fire Marshal nor any local public entity shall charge any fee for enforcing fire inspection regulations pursuant to state law or regulation or local ordinance, with respect to residential care facilities for the elderly (RCFE) which service six or fewer persons.

**1.11.4.6 Requests of the Office of the State Fire Marshal.** Whenever a local authority having jurisdiction requests that the State Fire Marshal perform plan review and/or inspection services related to a building permit, the applic-

*cable fees for such shall be payable to the Office of the State Fire Marshal.*

**1.11.5 Inspections.** *Work performed subject to the provisions of this code shall comply with the inspection requirements of Sections 109.1, 109.3, 109.3.4, 109.3.5, 109.3.6, 109.3.8, 109.3.9, 109.3.10 109.5 and 109.6 as adopted by the Office of the State Fire Marshal.*

**1.11.5.1 Existing Group I-1 or R occupancies.** *Licensed 24-hour care in a Group I-1 or R occupancy in existence and originally classified under previously adopted state codes shall be reinspected under the appropriate previous code, provided there is no change in the use or character which would place the facility in a different occupancy group.*

**1.11.6 Certificate of Occupancy.** *A Certificate of Occupancy shall be issued as specified in Section 111.*

**Exception:** *Group R, Division 3 and Group U occupancies.*

**1.11.7 Temporary structures and uses.** *See Section 108.*

**1.11.8 Service utilities.** *See Section 112.*

**1.11.9 Stop work order.** *See Section 115.*

**1.11.10 Unsafe buildings, structures and equipment.** *See Section 116.*

**Authority cited—** Education Code Sections 19950 through 19981.

**Reference—** Education Code Sections 19950 through 19981.

## SECTION 1.13 Reserved

## SECTION 1.14 CALIFORNIA STATE LANDS COMMISSION

**1.14.1** Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application—** Marine oil terminals.

**Enforcing agency—** California State Lands Commission.

**Authority cited—** Public Resources Code Section 8755.

**Reference—** Public Resources Code Section 8755.

## SECTION 1.12 STATE LIBRARIAN

**1.12.1** Specific scope of application of the agency responsible for enforcement, the enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

**Application—** Public library construction and renovation using funds from the California Library Construction and Renovation Bond Act of 1988.

**Enforcing agency—** State librarian.



## DIVISION II

# SCOPE AND ADMINISTRATION

**Note:** Sections adopted or amended by state agencies are specifically indicated by an agency banner or indicated in the Matrix Adoption Table.

## PART 1—SCOPE AND APPLICATION

### SECTION 101 GENERAL

**[A] 101.1 Title.** These regulations shall be known as the Building Code of [NAME OF JURISDICTION], hereinafter referred to as "this code."

**[A] 101.2 Scope.** The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

**Exception:** Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the *California Residential Code*.

**[A] 101.2.1 Appendices.** Provisions in the appendices shall not apply unless specifically adopted.

**[A] 101.3 Intent.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.

**[A] 101.4 Referenced codes.** The other codes listed in Sections 101.4.1 through 101.4.6 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

**[A] 101.4.1 Gas.** The provisions of the *California Mechanical Code* shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

**[A] 101.4.2 Mechanical.** The provisions of the *California Mechanical Code* shall apply to the installation, alterations, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

**[A] 101.4.3 Plumbing.** The provisions of the *California Plumbing Code* shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. The provisions of the *International Private Sewage Disposal Code* shall apply to private sewage disposal systems.

**[A] 101.4.4 Property maintenance.** The provisions of the *International Property Maintenance Code* shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of owners, operators and occupants; and occupancy of existing premises and structures.

**[A] 101.4.5 Fire prevention.** The provisions of the *California Fire Code* shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression, automatic sprinkler systems and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.

**[A] 101.4.6 Energy.** The provisions of the *California Energy Code* shall apply to all matters governing the design and construction of buildings for energy efficiency.

**Exception:** [OSHPD 1, 2, & 4] Not required by OSHPD.

### SECTION 102 APPLICABILITY

**[A] 102.1 General.** Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

**[A] 102.2 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

**[A] 102.3 Application of references.** References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

**[A] 102.4 Referenced codes and standards.** The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 through 102.4.4.

**[A] 102.4.1 Conflicts.** Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

**[A] 102.4.2 Provisions in referenced codes and standards.** Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code or the California Codes listed in Section 101.4, the provisions of this code or the California Codes listed in Section 101.4, as applicable, shall take precedence over the provisions in the referenced code or standard.

**102.4.3 Code References.** [OSHPD 1, 2, 3 & 4, DSA-SS & DSA-SS/CC] All reference to International Codes or other similar codes in referenced standards shall be replaced by equivalent provisions in the California Building Standards Codes.

**102.4.4 Reference in Standards.** [OSHPD 1, 2, 3 & 4, DSA-SS & DSA-SS/CC] All references listed in reference standards shall be replaced by referenced standards listed in Chapter 35 of this code, where applicable, and shall include all amendments to the reference standards in this code.

**[A] 102.5 Partial invalidity.** In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions.

**[A] 102.6 Existing structures.** The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *California Building Code* or the *California Fire Code*, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

## PART 2—ADMINISTRATION AND ENFORCEMENT

### SECTION 103 DEPARTMENT OF BUILDING SAFETY

**[A] 103.1 Creation of enforcement agency.** The Department of Building Safety is hereby created and the official in charge thereof shall be known as the building official.

**[A] 103.2 Appointment.** The building official shall be appointed by the chief appointing authority of the jurisdiction.

**[A] 103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the building official shall have the authority to appoint a deputy building official, the related technical officers, inspectors, plan examiners and other employees. Such employees shall have powers as delegated

by the building official. For the maintenance of existing properties, see the *California Property Maintenance Code*.

### SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL

**[A] 104.1 General.** The building official is hereby authorized and directed to enforce the provisions of this code. The building official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

**[A] 104.2 Applications and permits.** The building official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

**[A] 104.3 Notices and orders.** The building official shall issue all necessary notices or orders to ensure compliance with this code.

**[A] 104.4 Inspections.** The building official shall make all of the required inspections, or the building official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The building official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

**[A] 104.5 Identification.** The building official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

**[A] 104.6 Right of entry.** Where it is necessary to make an inspection to enforce the provisions of this code, or where the building official has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous or hazardous, the building official is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the building official shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the building official shall have recourse to the remedies provided by law to secure entry.

**[A] 104.7 Department records.** The building official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

**[A] 104.8 Liability.** The building official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the jurisdiction until the final termination of the proceedings. The building official or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

**[A] 104.9 Approved materials and equipment.** Materials, equipment and devices approved by the building official shall be constructed and installed in accordance with such approval.

**[A] 104.9.1 Used materials and equipment.** The use of used materials which meet the requirements of this code for new materials is permitted. Used equipment and devices shall not be reused unless approved by the building official.

**[A] 104.10 Modifications.** Wherever there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the building official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

**[A] 104.10.1 Flood hazard areas.** The building official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.

5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

**[A] 104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. *[DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4]* Alternative system shall satisfy ASCE 7 Section 1.3, unless more restrictive requirements are established by this code for an equivalent system.

Alternative systems also satisfy the California Administrative Code, Section 7-104. *[OSHPD 1, 2 & 4]* and Section 4-304 *[DSA-SS & DSA-SS/CC]*.

**[A] 104.11.1 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

**[A] 104.11.2 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

**104.11.3 Peer review.** *[OSHPD 1 & 4]* When peer review is required, it shall be performed pursuant to Section 3414A.

**104.11.4 Earthquake monitoring instruments.** *[OSHPD 1 & 4]* The enforcement agency may require earthquake monitoring instruments for any building that receives approval of an alternative system for the Lateral Force Resisting System (LFRS). There shall be a sufficient number of instruments to characterize the response of the building during an earthquake and shall include at least one tri-axial free field instrument or equivalent. A proposal for instrumentation and equipment specifications

*shall be forwarded to the enforcement agency for review and approval.*

*The instruments shall be interconnected for common start and common timing. Each instrument shall be located so that access is maintained at all times and is unobstructed by room contents. A sign stating "MAINTAIN CLEAR ACCESS TO THIS INSTRUMENT" shall be posted in a conspicuous location.*

*The Owner of the building shall be responsible for the implementation of the instrumentation program. Maintenance of the instrumentation and removal/processing of the records shall be the responsibility of the enforcement agency or its designated agent.*

## SECTION 105 PERMITS

**[A] 105.1 Required.** Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit.

**[A] 105.1.1 Annual permit.** In lieu of an individual permit for each alteration to an already approved electrical, gas, mechanical or plumbing installation, the building official is authorized to issue an annual permit upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure or on the premises owned or operated by the applicant for the permit.

**[A] 105.1.2 Annual permit records.** The person to whom an annual permit is issued shall keep a detailed record of alterations made under such annual permit. The building official shall have access to such records at all times or such records shall be filed with the building official as designated.

**[A] 105.2 Work exempt from permit.** Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

### Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area is not greater than 120 square feet ( $11 \text{ m}^2$ ).
2. Fences not over 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.

5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family dwellings.
12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

### Electrical:

**Repairs and maintenance:** Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

**Radio and television transmitting stations:** The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

**Temporary testing systems:** A permit shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

### Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

### Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.

5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

### **Plumbing:**

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and re-installation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

**[A] 105.2.1 Emergency repairs.** Where equipment replacements and repairs must be performed in an emergency situation, the permit application shall be submitted within the next working business day to the building official.

**[A] 105.2.2 Repairs.** Application or notice to the building official is not required for ordinary repairs to structures, replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

**[A] 105.2.3 Public service agencies.** A permit shall not be required for the installation, alteration or repair of generation, transmission, distribution or metering or other related equipment that is under the ownership and control of public service agencies by established right.

**[A] 105.3 Application for permit.** To obtain a permit, the applicant shall first file an application therefor in writing on a form furnished by the department of building safety for that purpose. Such application shall:

1. Identify and describe the work to be covered by the permit for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or work.

3. Indicate the use and occupancy for which the proposed work is intended.
4. Be accompanied by construction documents and other information as required in Section 107.
5. State the valuation of the proposed work.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the building official.

**[A] 105.3.1 Action on application.** The building official shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject such application in writing, stating the reasons therefor. If the building official is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the building official shall issue a permit therefor as soon as practicable.

**[A] 105.3.2 Time limitation of application.** An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official is authorized to grant one or more extensions of time for additional periods not exceeding 90 days each. The extension shall be requested in writing and justifiable cause demonstrated. *[OSHPD 1, 2, & 4] Time limitation shall be in accordance with the California Administrative Code, Chapter 7, Section 7-129.*

**[A] 105.4 Validity of permit.** The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

**[A] 105.5 Expiration.** Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

**[A] 105.6 Suspension or revocation.** The building official is authorized to suspend or revoke a permit issued under the provisions of this code wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete informa-

tion, or in violation of any ordinance or regulation or any of the provisions of this code.

**[A] 105.7 Placement of permit.** The building permit or copy shall be kept on the site of the work until the completion of the project.

## SECTION 106 FLOOR AND ROOF DESIGN LOADS

**[A] 106.1 Live loads posted.** Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf (2.40 kN/m<sup>2</sup>), such design live loads shall be conspicuously posted by the owner in that part of each story in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.

**106.1.1 Snow Load Posting.** *[DSA-SS & DSA-SS/CC, OSHPD 1, 2, & 4]* Snow loads used in design shall be posted as for live loads.

**106.1.2 Load Posting Responsibility.** *[OSHPD 1, 2, & 4]* The owner or governing board shall be responsible for keeping the actual load below the allowable limits.

**[A] 106.2 Issuance of certificate of occupancy.** A certificate of occupancy required by Section 111 shall not be issued until the floor load signs, required by Section 106.1, have been installed.

**[A] 106.3 Restrictions on loading.** It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by this code.

## SECTION 107 SUBMITTAL DOCUMENTS

**[A] 107.1 General.** Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data shall be submitted in two or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

**Exception:** The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

**[A] 107.2 Construction documents.** Construction documents shall be in accordance with Sections 107.2.1 through 107.2.5.

**[A] 107.2.1 Information on construction documents.** Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building

official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

**[A] 107.2.2 Fire protection system shop drawings.** Shop drawings for the fire protection system(s) shall be submitted to indicate conformance to this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

**[A] 107.2.3 Means of egress.** The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress including the path of the exit discharge to the public way in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-1, the construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

**[A] 107.2.4 Exterior wall envelope.** Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.

The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used.

**[A] 107.2.5 Site plan.** The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

**[A] 107.2.5.1 Design flood elevations.** Where design flood elevations are not specified, they shall be established in accordance with Section 1612.3.1.

**[A] 107.3 Examination of documents.** The building official shall examine or cause to be examined the accompanying submittal documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

**[A] 107.3.1 Approval of construction documents.** When the building official issues a permit, the construction documents shall be approved, in writing or by stamp, as "Reviewed for Code Compliance." One set of construction documents so reviewed shall be retained by the building official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.

**[A] 107.3.2 Previous approvals.** This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

**[A] 107.3.3 Phased approval.** The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

**[A] 107.3.4 Design professional in responsible charge.** When it is required that documents be prepared by a registered design professional, the building official shall be authorized to require the owner to engage and designate on the building permit application a registered design professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The building official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties.

The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

**[A] 107.3.4.1 Deferred submittals.** For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time

of the application and that are to be submitted to the building official within a specified period.

Deferral of any submittal items shall have the prior approval of the building official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official.

Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been approved by the building official. *[OSHPD 1, 2, & 4] Deferred submittals shall be in accordance with the California Administrative Code, Chapter 7, Section 7-126.*

**[A] 107.4 Amended construction documents.** Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

**[A] 107.5 Retention of construction documents.** One set of approved construction documents shall be retained by the building official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

## SECTION 108 TEMPORARY STRUCTURES AND USES

**[A] 108.1 General.** The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

**[A] 108.2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

**[A] 108.3 Temporary power.** The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.

**[A] 108.4 Termination of approval.** The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.

## SECTION 109 FEES

**[A] 109.1 Payment of fees.** A permit shall not be valid until the fees prescribed by law have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

**[A] 109.2 Schedule of permit fees.** On buildings, structures, electrical, gas, mechanical, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

**[A] 109.3 Building permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official.

**[A] 109.4 Work commencing before permit issuance.** Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the building official that shall be in addition to the required permit fees.

**[A] 109.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a building permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

**[A] 109.6 Refunds.** The building official is authorized to establish a refund policy.

## SECTION 110 INSPECTIONS

**[A] 110.1 General.** Construction or work for which a *permit* is required shall be subject to inspection by the building official and such construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the building official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

**[A] 110.2 Preliminary inspection.** Before issuing a permit, the building official is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

**[A] 110.3 Required inspections.** The building official, upon notification, shall make the inspections set forth in Sections 110.3.1 through 110.3.10.

**[A] 110.3.1 Footing and foundation inspection.** Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

**[A] 110.3.2 Concrete slab and under-floor inspection.** Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

**[A] 110.3.3 Lowest floor elevation.** In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 shall be submitted to the building official.

**[A] 110.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fire-blocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.

**110.3.4.1 (HCD 1) Moisture content verification.**  
*Moisture content of framing members shall be verified in accordance with the California Green Building Standards Code (CALGreen), Chapter 4, Division 4.5.*

**[A] 110.3.5 Lath and gypsum board inspection.** Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.

**Exception:** Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

**[A] 110.3.6 Fire- and smoke-resistant penetrations.** Protection of joints and penetrations in fire-resistance-rated assemblies, smoke barriers and smoke partitions shall not be concealed from view until inspected and approved.

**[A] 110.3.7 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: envelope insulation R- and U-values, fenestration U-value, duct system R-value, and HVAC and water-heating equipment efficiency.

**[A] 110.3.8 Other inspections.** In addition to the inspections specified in Sections 110.3.1 through 110.3.7, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

[A] **110.3.9 Special inspections.** For special inspections, see Chapter 17.

[A] **110.3.10 Final inspection.** The final inspection shall be made after all work required by the building permit is completed.

[A] **110.3.10.1 Flood hazard documentation.** If located in a flood hazard area, documentation of the elevation of the lowest floor as required in Section 1612.5 shall be submitted to the building official prior to the final inspection.

**110.3.10.2 (HCD 1) Operation and maintenance manual.** At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency shall be placed in the building in accordance with the California Green Building Standards Code (CALGreen), Chapter 4, Division 4.4.

[A] **110.4 Inspection agencies.** The building official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

[A] **110.5 Inspection requests.** It shall be the duty of the holder of the building permit or their duly authorized agent to notify the building official when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

[A] **110.6 Approval required.** Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the building official. The building official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the building official.

## SECTION 111 CERTIFICATE OF OCCUPANCY

[A] **111.1 Use and occupancy.** No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made, until the building official has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

**Exception:** Certificates of occupancy are not required for work exempt from permits under Section 105.2.

[A] **111.2 Certificate issued.** After the building official inspects the building or structure and finds no violations of the provisions of this code or other laws that are enforced by the department of building safety, the building official shall issue a certificate of occupancy that contains the following:

1. The building permit number.
2. The address of the structure.

3. The name and address of the owner.
4. A description of that portion of the structure for which the certificate is issued.
5. A statement that the described portion of the structure has been inspected for compliance with the requirements of this code for the occupancy and division of occupancy and the use for which the proposed occupancy is classified.
6. The name of the building official.
7. The edition of the code under which the permit was issued.
8. The use and occupancy, in accordance with the provisions of Chapter 3.
9. The type of construction as defined in Chapter 6.
10. The design occupant load.
11. If an automatic sprinkler system is provided, whether the sprinkler system is required.
12. Any special stipulations and conditions of the building permit.

[A] **111.3 Temporary occupancy.** The building official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely. The building official shall set a time period during which the temporary certificate of occupancy is valid.

[A] **111.4 Revocation.** The building official is authorized to, in writing, suspend or revoke a certificate of occupancy or completion issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

## SECTION 112 SERVICE UTILITIES

[A] **112.1 Connection of service utilities.** No person shall make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until released by the building official.

[A] **112.2 Temporary connection.** The building official shall have the authority to authorize the temporary connection of the building or system to the utility source of energy, fuel or power.

[A] **112.3 Authority to disconnect service utilities.** The building official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards set forth in Section 101.4 in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 112.1 or 112.2. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service

system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

### SECTION 113 BOARD OF APPEALS

**[A] 113.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.

**[A] 113.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

**[A] 113.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

### SECTION 114 VIOLATIONS

**[A] 114.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

**[A] 114.2 Notice of violation.** The building official is authorized to serve a notice of violation or order on the person responsible for the erection, construction, alteration, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

**[A] 114.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the building official is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

**[A] 114.4 Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official,

or of a permit or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law.

### SECTION 115 STOP WORK ORDER

**[A] 115.1 Authority.** Whenever the building official finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the building official is authorized to issue a stop work order.

**[A] 115.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

**[A] 115.3 Unlawful continuance.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

### SECTION 116 UNSAFE STRUCTURES AND EQUIPMENT

**[A] 116.1 Conditions.** Structures or existing equipment that are or hereafter become unsafe, insanitary or deficient because of inadequate means of egress facilities, inadequate light and ventilation, or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. Unsafe structures shall be taken down and removed or made safe, as the building official deems necessary and as provided for in this section. A vacant structure that is not secured against entry shall be deemed unsafe.

**[A] 116.2 Record.** The building official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition.

**[A] 116.3 Notice.** If an unsafe condition is found, the building official shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvements to be made to abate the unsafe condition, or that requires the unsafe structure to be demolished within a stipulated time. Such notice shall require the person thus notified to declare immediately to the building official acceptance or rejection of the terms of the order.

**[A] 116.4 Method of service.** Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall

be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

**[A] 116.5 Restoration.** The structure or equipment determined to be unsafe by the building official is permitted to be restored to a safe condition. To the extent that repairs, alterations or additions are made or a change of occupancy occurs during the restoration of the structure, such repairs, alterations, additions or change of occupancy shall comply with the requirements of Section 105.2.2 and Chapter 34.



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 2 – DEFINITIONS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X		X								
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
201.3		X																		
201.4		X																		
202		X	X	X	X															
Access Aisle						X														
Accessibility			X	X	X	X														
<i>Accessibility Function Button</i>							X													
Accessible			X	X	X	X														
Accessible Element						X														
Accessible Means of Egress						X														
Accessible Route			X	X	X	X														
Accessible Space						X														
<i>Active Equipment/Component</i>							X	X	X	X	X	X								
Adaptable						X														
Adaptable Dwelling Unit		X	X	X																
<i>Addition (2nd paragraph only)</i>							X													
<i>Administrative Authority</i>							X													
Aged Home or Institution	X																			
<i>Aisle (2nd paragraph only)</i>							X													
Alteration						X														
<i>Alternative System</i>									X		X									
Amusement Attraction						X														
Amusement Ride						X														
Amusement Ride Seat						X														
<i>Ancillary Facility</i>												X								
ANSI						X														
Approved (with notes)		X	X	X																
<i>Approved (2nd paragraph only) (w/o notes)</i>							X													
Approved Agency		X	X																	
Approved Listing Agency		X	X	X																
Approved Testing Agency		X	X	X	X															
Area of Refuge							X													
Area of Sport Activity							X													
Assembly Area							X													
Assistive Device		X	X	X																
<i>Assistive Listening System (ALS)</i>							X													
Associated Structural Alterations										X		X								
At-Grade Station	X																			
Automatic Door			X	X	X	X														
Automatic Teller Machine (ATM)						X														

*(continued)*

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
<i>Backwash</i>														X						
Bathroom			X	X	X	X														
Bedridden Person	X																			
<i>Blended Transition</i>							X													
<i>Boarding Pier</i>								X												
<i>Boat Launch Ramp</i>									X											
<i>Boat Slip</i>									X											
Building		X																		
Building (with exception)			X	X	X															
Building (w/o notes)							X													
Building Entrance on an Accessible Route			X	X	X															
Building, Existing			X	X	X															
Building Official						X														
<i>Cantilevered Decking</i>													X							
Care and Supervision	X																			
<i>Carriage Unit</i>			X			X														
Catastrophically Injured	X																			
<i>Catch Pool</i>						X														
CCR							X													
<i>CDF Director</i>		X																		
<i>Cell [SFM]</i>		X																		
<i>Cell Complex</i>		X																		
<i>Cell Tiers</i>		X																		
Cellular Concrete			X	X	X															
<i>Central Control Building</i>		X																		
<i>Characters</i>			X	X	X	X														
<i>Charter School</i>		X																		
<i>Child-Care Center</i>		X																		
<i>Child-Care Facilities</i>		X																		
<i>Child or Children</i>		X																		
<i>Children's Use</i>						X														
<i>Chronically Ill</i>		X																		
<i>Circulation Path</i>						X														
<i>Clean Pool Water</i>													X							
<i>Clear</i>							X													
<i>Clear Pool Water</i>													X							
<i>Clear Floor Space</i>								X												
<i>Clinic, Outpatient</i>		X																		

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
Closed-Circuit Telephone							X													
Commercial Facilities							X													
Common Use			t	t			X													
Common Use Areas			X	X	X															
Community Care Facility	X																			
Comply With							X													
Concrete, Cellular			X	X	X															
Congregate Living Health Facility (CLHF)	X																			
Congregate Residence	X																			
Coping													X							
Corrosion Resistant													X							
Courtroom Dock	X																			
Courthouse Holding Facility [SFM]	X																			
Covered Multifamily Dwellings			X	X	X															
Cross Slope			X	X	X	X														
Curb Cut			X	X	X	X														
Curb Ramp			X	X	X	X														
Dangerous	X																			
Day-Care	X																			
Day-Care Home, Family	X																			
Day-Care Home, Large Family	X																			
Day-Care Home, Small Family	X																			
Day Room	X																			
Deck													X							
Department			X	X	X															
Designated Public Transportation								X												
Destination-Oriented Elevator								X												
Detached Single-Family Dwelling			X	X	X															
Detectable Warning			X	X	X	X														
Detention Elevator [SFM]	X														X					
Detention Treatment Room [SFM]	X																			
Detoxification Facilities	X																			
Diaphragm, Rigid									X	X	X		X							
Diatomaceous Earth													X							
Direct Access	X																			
Directional Sign			X	X	X	X														
Disability								X												
Dormitory	X							X												
Dormitory [SFM]	X																			
Dwelling Unit			X	X	X															
Easily Cleanable													X							
Effective Particle Size													X							
Efficiency Dwelling Unit			X	X	X															
Electric Vehicle	X																			
Element								X												

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X				X		X	X							
Chapter / Section																				
<i>Elevated Play Component</i>						X														
<i>Elevated Station</i>		X																		
Elevator, Passenger			X	X	X	X														
<i>Emergency Management Panel (EMP)</i>		X																		
<i>Employee Work Area</i>						X														
<i>Enclosed Station</i>		X																		
Enforcement			X	X	X															
<i>Enforcement Agent</i>						X	X	X		X										
<i>Enforcing Agency</i>		X	X	X	X	X			X	X	X	X	X							
<i>Engineering Analysis (Fire Hazard/ Fire Risk Assessment</i>		X																		
Entrance					X	X														
Equipment Area		X											X							
<i>Equivalent Facilitation</i>			X	X	X	X														
<i>Existing Building</i>			X	X	X															
<i>Existing Building or Facility</i>						X														
<i>Existing Structure</i>		X							X	X										
Exit						X														
<i>Exterior Covering</i>		X																		
Facility			X	X	X	X														
Family			X	X	X															
<i>Fire Appliance [SFM]</i>		X																		
<i>Fire Hazard Severity Zones</i>		X																		
<i>Fire Protection Plan</i>		X																		
<i>Fire-Retardant Treated Wood [SFM]</i>		X																		
<i>Fire-Smoke Barrier [SFM]</i>		X																		
<i>Fixed Guideway Transit System</i>		X																		
<i>Foster Family Home</i>		X																		
<i>Freestanding Acute Psychiatric Building (APB)</i>									X											
<i>Freestanding Skilled Nursing Building (SNB)</i>									X											
Full-Time Care		X																		
<i>Functional Area</i>						X														
Gangway						X														
<i>General Acute Care Building (GAC Building)</i>									X											
<i>General Acute Care Hospital</i>									X		X									
<i>Golf Car Passage</i>						X														
Grab Bar			X	X	X	X														
Grade (Adjacent Ground Elevation)			X	X	X	X														
<i>Grade Break</i>							X													
Ground Floor			X	X	X	X														
<i>Ground Level Play Component</i>							X													
<i>Guard (or Guardrail)</i>			X	X	X	X														

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X			X	X	X	X	X							
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
<i>Guideway</i>		X																		
<i>Hall Call Console</i>							X													
<i>Handhold</i>													X							
<i>Handrail</i>				X	X	X	X													
<i>Hazardous Substance [SFM]</i>	X																			
<i>Health Care Provider</i>								X												
<i>Heavy Timber</i>	X																			
<i>High-Rise Building</i>	X																			
<i>High-Rise Building Access</i>	X																			
<i>Historic Buildings</i>							X													
<i>Holding Facility</i>	X																			
<i>Hotel or Motel</i>				X	X	X														
<i>Housing at a Place of Education</i>							X	X												
<i>Housing Unit</i>	X																			
<i>Hydrogen Fuel Gas Room</i>	X																			
<i>If, If... Then</i>							X													
<i>Ignition-Resistant Material</i>	X																			
<i>Incidental Structural Alterations, Additions or Repairs</i>											X		X							
<i>Infant</i>	X																			
<i>Intended to be occupied as a Resident</i>			t	t	t															
<i>Inlet</i>													X							
<i>International Symbol of Accessibility</i>						X	X													
<i>Key Station</i>								X												
<i>Kick Plate</i>			X	X	X	X														
<i>Kitchen or Kitchenette</i>								X												
<i>Labeled</i>			X	X	X															
<i>Laboratory [SFM]</i>	X																			
<i>Laboratory Suite [SFM]</i>	X																			
<i>Ladder</i>														X						
<i>Lavatory</i>						X	X													
<i>Level Area</i>			X	X	X															
<i>Lift., Platform (Wheelchair)</i>			X	X	X															
<i>Liquid Tight Floor [SFM]</i>	X																			
<i>Listed</i>	X	X	X	X																
<i>Listing Agency</i>		X	X	X																
<i>Living Unit</i>														X						
<i>Local Agency Very High Fire Hazard Severity Zone</i>	X																			
<i>Lobby [SFM]</i>	X	X	X	X																
<i>Lodging House</i>		X	X	X																
<i>Log Wall Construction</i>	X																			
<i>Mail Boxes</i>								X												
<i>Main Drain</i>														X						

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
<i>Major Structural Alterations, Additions or Repairs</i>									X		X									
Marked Crossing			X	X	X	X														
May							X													
<i>Medical Pool</i>													X							
Mentally Disabled Persons, Profoundly or Severely		X																		
Mezzanine						X														
<i>Minor Structural Alteration, Additions or Repairs</i>									X		X									
Motel			X	X																
Motion Picture and Television Pro- duction Studio Sound Stage, Approved Production Facilities and Production Locations		X																		
<i>Multi-bedroom Housing Unit</i>						X														
Multistory Dwelling Unit			X	X	X															
<i>Naturally Durable Wood</i>																				
New High-Rise Building		X																		
Newly Constructed			X	X	X															
<i>Next Generation Attenuation (NGA)</i>							X	X	X			X								
NFPA							X													
<i>Non-General Acute Care Building (Non-GAC Building)</i>									X											
Nonambulatory Persons		X																		
<i>Noncombustible [SFM]</i>		X																		
Nonstructural Alteration									X		X									
Normal			X	X	X															
Nosing						X														
NPC 1, NPC 2, NPC 3/NPC 3R, NPC 4 and NPC 5									X		X									
Occupant Load							X													
Occupiable Space								X												
Open Riser			X	X	X	X														
Open Station		X																		
Operable Part					X	X														
<i>Operations Control Center (OCC) (Central Control)</i>		X																		
Organized Camps		X																		
Outlet													X							
Passage Door			X	X	X															
Passenger Elevator			X	X	X	X														
Passive Solar Energy Collector			X	X	X															
Path of Travel						X														
Patio Cover		X																		
Pedestrian			X	X	X	X														
Pedestrian Ramp																				
Pedestrian Way			X	X	X	X														
Peer Review										X		X								

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X				X		X								
Chapter / Section																				
Performance Standard													X							
Perimeter Overflow System													X							
Permanent						X														
Permanent Portable Building [SFM]	X																			
Permissible Exposure Limit													X							
Permit						X														
Persons with Disabilities		X	X	X																
Pictogram						X	X													
Place of Public Accommodation						X	X													
Platform							X													
Platform (Wheelchair) Lift		X	X	X	X															
Play Area							X													
Play Component						X														
Point of Safety	X																			
Pool or Public Pool													X							
Pool Operator or Operator													X							
Pool User													X							
Point-of-Sale Device							X													
Powder Room		X	X	X	X															
Power-Assisted Door							X													
Power Substation	X																			
Primary Entry		X	X	X																
Primary-Entry Level		X	X	X																
Primary Function	X																			
Private Building or Facility							X													
Professional Office of a Health Care Provider								X												
Protective Social Care Facility [SFM]	X																			
Public Accommodation																				
Public Building or Facility								X												
Public Entity								X	X											
Public Entrance		X	X	X	X															
Public Housing							X	X												
Public Use								X												
Public-Use Areas		X	X	X	X															
Public Way							X													
Publicly Funded																				
Qualified Historic Building or Facil- ty							X													
Radius of Curvature													X							
Raftertail	X																			
Ramp							X													
Readily Accessible													X							

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X	X									
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
<i>Readily Disassembled</i>													X							
<i>Reasonable Portion</i>							X													
<i>Recessed Steps</i>													X							
<i>Recirculation System</i>													X							
<i>Recommend</i>			X	X	X	X														
<i>Relocatable Building (Public School)</i>	X																			
<i>Remodeling</i>						X														
<i>Repair</i>						X				X			X	X						
<i>Residential Care Facility for the Chronically Ill (RCF/CI)</i>	X																			
<i>Residential Care Facility for the Elderly (RCFE)</i>	X																			
<i>Residential Dwelling Unit</i>						X														
<i>Residential Facility (RF)</i>	X																			
<i>Restraint [SFM]</i>	X																			
<i>Restricted Entrance</i>						X														
<i>Retrofit</i>	X						X	X	X	X	X	X								
<i>Rim Flow Gutter</i>													X							
<i>Riser</i>			X	X	X	X														
<i>Roof Eave</i>	X																			
<i>Roof Eave Soffit</i>	X																			
<i>Rugged Equipment</i>							X	X	X	X	X	X								
<i>Running Slope</i>			X	X	X	X														
<i>Sanitary Facility</i>			X	X	X															
<i>Secure Interview Rooms</i>	X																			
<i>Self-Service Storage</i>						X														
<i>Service Entrance</i>						X														
<i>Shall</i>						X														
<i>Shopping Center (or Shopping Mall)</i>						X														
<i>Should</i>			X	X	X	X														
<i>Sidewalk</i>			X	X	X	X														
<i>Signage</i>						X														
<i>Significant Loss of Function</i>							X	X	X	X	X	X								
<i>Single-Accommodation Sanitary Facility</i>			X	X	X															
<i>Sink</i>						X	X													
<i>Site</i>								X												
<i>Site Development</i>			X	X	X															
<i>Skimmer Equalizer Line</i>													X							
<i>Sleeping Accommodations</i>			X	X	X	X														
<i>Slip Resistant</i>																	X			
<i>Slope</i>				X	X	X														

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X		X	X	X	X		X								
Adopt only those sections that are listed below						X				X			X	X						
Chapter / Section																				
<i>Small Management Yard</i>		X																		
<i>Soft Contained Play Structure</i>							X													
<i>Sound Transmission Class (STC)</i>																				
<i>Spa Pool or Spa</i>													X							
<i>Space</i>			X	X	X	X														
<i>SPC Building</i>										X										
<i>SPC 1, SPC 2, SPC 3, SPC 4 and SPC 5</i>										X		X								
<i>Special Purpose Pool</i>													X							
<i>Specified Public Transportation</i>							X													
<i>Splash Zone</i>													X							
<i>Spray Ground</i>													X							
<i>Springline</i>													X							
<i>Stage</i>							X													
<i>Stair</i>							X													
<i>Stairs</i>												X								
<i>Stairway</i>							X													
<i>State-Owned/Leased Building [SFM]</i>		X																		
<i>State Responsibility Area</i>		X																		
<i>Station</i>		X																		
<i>Station Platform</i>		X																		
<i>Step</i>													X							
<i>Story (2nd paragraph only)</i>							X													
<i>Structural Frame</i>								X												
<i>Structure</i>								X												
<i>Suction Outlet</i>													X							
<i>Surge Basin</i>													X							
<i>Substantial Structural Damage</i>		X								X		X								
<i>Tactile</i>			X	X	X	X														
<i>Tactile Sign</i>			X	X	X	X														
<i>Technically Infeasible</i>		X					X													
<i>Teeing Ground</i>								X												
<i>Tempered Water</i>															X					
<i>Temporary</i>							X													
<i>Temporary Holding Cell, Room or Area. [CSA and SFM]</i>		X											X							
<i>Temporary Holding Facility [SFM]</i>		X																		
<i>Tenable Environment [SFM]</i>		X																		
<i>Terminally III</i>		X																		
<i>Testing Agency</i>			X	X	X															
<i>Text Telephone</i>						X	X													
<i>Transfer Device</i>							X													
<i>Transient Lodging</i>			X	X	X	X														
<i>Transit Boarding Platform</i>							X													

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X		X	X	X	X	X								
Adopt only those sections that are listed below						X					X		X	X						
Chapter / Section																				
<i>Transition Plate</i>							X													
<i>Tread</i>			X	X	X	X														
<i>TTY</i>					X	X														
<i>Turnover Time</i>														X						
<i>Underground Station</i>		X																		
<i>Uniformity Coefficient</i>														X						
<i>Unreasonable Hardship</i>					X	X														
<i>Use Zone</i>							X													
<i>Valuation Threshold</i>						X														
<i>Variable Message Signs (VMS)</i>							X													
<i>Variable Message Sign (VMS) Characters</i>								X												
<i>Vehicular or Pedestrian Arrival Points</i>			X	X	X															
<i>Vehicular Way</i>					X	X														
<i>Voluntary Structural Alteration</i>									X		X									
<i>Wading Pool</i>														X						
<i>Waiting Room [SFM]</i>		X																		
<i>Walk</i>			X	X	X	X														
<i>Water Feature</i>														X						
<i>Waterline</i>															X					
<i>Wet Bar</i>								X												
<i>Wheelchair</i>			X	X	X	X														
<i>Wheelchair Space</i>							X													
<i>Wildfire</i>		X																		
<i>Wildfire Exposure</i>		X																		
<i>Wildland-Urban Interface Fire Area</i>		X																		
<i>Winery Caves</i>		X																		
<i>Work Area Equipment</i>							X													
<i>Workstation (2nd paragraph only)</i>								X												

The state agency does not adopt sections identified by the following symbol: †

The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 1.11.

## CHAPTER 2

# DEFINITIONS

### SECTION 201 GENERAL

**201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

**201.2 Interchangeability.** Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

**201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the *California Fire Code*, *California Mechanical Code* or *California Plumbing Code*, such terms shall have the meanings ascribed to them as in those codes.

**201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

*For applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies. Webster's Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinarily accepted meanings.*

### SECTION 202 DEFINITIONS

**24-HOUR CARE.** The actual time that a person is an occupant within a facility for the purpose of receiving care. It shall not include a facility that is open for 24 hours and is capable of providing care to someone visiting the facility during any segment of the 24 hours.

**AAC MASONRY.** Masonry made of autoclaved aerated concrete (AAC) units, manufactured without internal reinforcement and bonded together using thin- or thick-bed mortar.

**ACCESS AISLE. [DSA-AC].** An accessible pedestrian space adjacent to or between parking spaces that provides clearances in compliance with this code.

**ACCESSIBILITY. [DSA-AC & HCD 1-AC]** Accessibility is the combination of various elements in a building, facility, site, or area, or portion thereof which allows access, circulation and the full use of the building and facilities by persons with disabilities in compliance with this code.

**ACCESSIBILITY FUNCTION BUTTON. [DSA-AC]** A button on an elevator hall call console in a destination-oriented elevator system that when pressed will activate a series of visual and verbal prompts and announcements providing

instruction regarding hall call console operation and direction to an assigned elevator.

**ACCESSIBLE. [DSA-AC & HCD 1-AC]** A site, building, facility, or portion thereof that is approachable and usable by persons with disabilities in compliance with this code.

**ACCESSIBLE ELEMENT. [DSA-AC]** An element specified by the regulations adopted by the Division of the State Architect-Access Compliance.

**ACCESSIBLE MEANS OF EGRESS.** A continuous and unobstructed way of egress travel from any accessible point in a building or facility to a public way.

**ACCESSIBLE ROUTE. [DSA-AC & HCD 1-AC]** A continuous unobstructed path connecting accessible elements and spaces of an accessible site, building or facility that can be negotiated by a person with a disability using a wheelchair, and that is also safe for and usable by persons with other disabilities. Interior accessible routes may include corridors, hallways, floors, ramps, elevators and lifts. Exterior accessible routes may include parking access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps and lifts.

**ACCESSIBLE SPACE. [DSA-AC]** A space that complies with the accessibility provisions of this code

**ACCREDITATION BODY.** An approved, third-party organization that is independent of the grading and inspection agencies, and the lumber mills, and that initially accredits and subsequently monitors, on a continuing basis, the competency and performance of a grading or inspection agency related to carrying out specific tasks.

**ACTIVE EQUIPMENT/COMPONENT. [DSA-SS, DSA-SS/CC & OSHPD 1, 2, 3 & 4]** Equipment/Component containing moving or rotating parts, electrical parts such as switches or relays, or other internal components that are sensitive to earthquake forces and critical to the function of the equipment.

**ADAPTABLE. [DSA-AC]** Capable of being readily modified and made accessible.

**ADAPTABLE DWELLING UNIT. [HCD 1-AC]** An accessible dwelling unit within a covered multifamily building as designed with elements and spaces allowing the dwelling unit to be adapted or adjusted to accommodate the user. See Chapter 11A, Division IV.

**[A] ADDITION.** An extension or increase in floor area or height of a building or structure. [DSA-AC] An expansion, extension or increase in the gross floor area or height of a building or facility.

**ADHERED MASONRY VENEER.** Veneer secured and supported through the adhesion of an approved bonding material applied to an approved backing.

**ADMINISTRATIVE AUTHORITY. [DSA-AC]** A governmental agency that adopts or enforces regulations and guide-

## DEFINITIONS

*lines for the design, construction or alteration of buildings and facilities.*

**ADOBE CONSTRUCTION.** Construction in which the exterior load-bearing and nonload-bearing walls and partitions are of unfired clay masonry units, and floors, roofs and interior framing are wholly or partly of wood or other approved materials.

**Adobe, stabilized.** Unfired clay masonry units to which admixtures, such as emulsified asphalt, are added during the manufacturing process to limit the units' water absorption so as to increase their durability.

**Adobe, unstabilized.** Unfired clay masonry units that do not meet the definition of "Adobe, stabilized."

**[F] AEROSOL.** A product that is dispensed from an aerosol container by a propellant. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.

**Level 1 aerosol products.** Those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb) (20 kJ/g).

**Level 2 aerosol products.** Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).

**Level 3 aerosol products.** Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30 kJ/g).

**[F] AEROSOL CONTAINER.** A metal can or a glass or plastic bottle designed to dispense an aerosol. Metal cans shall be limited to a maximum size of 33.8 fluid ounces (1000 ml). Glass or plastic bottles shall be limited to a maximum size of 4 fluid ounces (118 ml).

**AGED HOME OR INSTITUTION.** A facility used for the housing of persons 65 years of age or older in need of care and supervision. (See definition of "care and supervision")

**AGGREGATE.** In roofing, crushed stone, crushed slag or water-worn gravel used for surfacing for roof coverings.

**AGRICULTURAL BUILDING.** A structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products. This structure shall not be a place of human habitation or a place of employment where agricultural products are processed, treated or packaged, nor shall it be a place used by the public.

**AIR-INFLATED STRUCTURE.** A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized area used to support the structure.

**AIR-SUPPORTED STRUCTURE.** A structure wherein the shape of the structure is attained by air pressure and occupants of the structure are within the elevated pressure area. Air-supported structures are of two basic types:

**Double skin.** Similar to a single skin, but with an attached liner that is separated from the outer skin and provides an airspace which serves for insulation, acoustic, aesthetic or similar purposes.

**Single skin.** Where there is only the single outer skin and the air pressure is directly against that skin.

**AISLE.** An unenclosed exit access component that defines and provides a path of egress travel. *[DSA-AC] A circulation path between objects such as seats, tables, merchandise, equipment, displays, shelves, desks, etc., that provides clearances in compliance with this code.*

**AISLE ACCESSWAY.** That portion of an exit access that leads to an aisle.

**[F] ALARM NOTIFICATION APPLIANCE.** A fire alarm system component such as a bell, horn, speaker, light or text display that provides audible, tactile or visible outputs, or any combination thereof.

**[F] ALARM SIGNAL.** A signal indicating an emergency requiring immediate action, such as a signal indicative of fire.

**[F] ALARM VERIFICATION FEATURE.** A feature of automatic fire detection and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period, after being *automatically* reset, in order to be accepted as a valid alarm-initiation signal.

**ALLOWABLE STRESS DESIGN.** A method of proportioning structural members, such that elastically computed stresses produced in the members by nominal loads do not exceed specified allowable stresses (also called "working stress design").

**[A] ALTERATION.** Any construction or renovation to an existing structure other than repair or addition. *[DSA-AC] A change, addition or modification in construction; change in occupancy or use, or structural repair to an existing building or facility. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, resurfacing of circulation paths or vehicular ways, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.*

**ALTERNATING TREAD DEVICE.** A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

**ALTERNATIVE SYSTEM. [OSHPD 1 & 4]** Alternative materials, design and methods of construction in accordance with Section 104.11, Section 11.1.4 of ASCE 7 or structural design criteria as approved by the enforcement agency.

**AMBULATORY CARE FACILITY.** Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to individuals who are rendered incapable of self-preservation by the services provided.

**AMUSEMENT ATTRACTION. [DSA-AC]** Any facility, or portion of a facility, located within an amusement park or theme park which provides amusement without the use of an amusement device. Amusement attractions include, but are not limited to, fun houses, barrels and other attractions without seats.

**AMUSEMENT RIDE.** [DSA-AC] A system that moves persons through a fixed course within a defined area for the purpose of amusement.

**AMUSEMENT RIDE SEAT.** [DSA-AC] A seat that is built-in or mechanically fastened to an amusement ride intended to be occupied by one or more passengers.

**ANCHOR.** Metal rod, wire or strap that secures masonry to its structural support.

**ANCHOR BUILDING.** An exterior perimeter building of a group other than H having direct access to a covered or open mall building but having required means of egress independent of the mall.

**ANCHORED MASONRY VENEER.** Veneer secured with approved mechanical fasteners to an approved backing

**ANNULEAR SPACE.** The opening around the penetrating item.

**[F] ANNUNCIATOR.** A unit containing one or more indicator lamps, alphanumeric displays or other equivalent means in which each indication provides status information about a circuit, condition or location.

**ANSI.** [DSA-AC] The American National Standards Institute.

**[A] APPROVED.** Acceptable to the building official or authority having jurisdiction.

**[HCD 1, HCD 2 & DSA-AC]** "Approved" means meeting the approval of the enforcing agency, except as otherwise provided by law, when used in connection with any system, material, type of construction, fixture or appliance as the result of investigations and tests conducted by the agency, or by reason of accepted principles or tests by national authorities or technical, health or scientific organizations or agencies.

**Notes: [HCD 1 & HCD 2]**

1. See Health and Safety Code Section 17920 for "Approved" as applied to residential construction and buildings or structures accessory thereto, as referenced in Section 1.8.2.1.1.
- > 2. See Health and Safety Code Section 17921.1 for "Approved" as applied to the use of hotplates in residential construction referenced in Section 1.8.2.1.1.
- || 3. See Health and Safety Code Section 19966 for "Approved" as applied to factory-built housing as referenced in Section 1.8.3.2.5.
- || 4. See Health and Safety Code Section 18201 for "Approved" as applied to mobilehome parks as referenced in Section 1.8.2.1.3.
- || 5. See Health and Safety Code Section 18862.1 for "Approved" as applied to special occupancy parks as referenced in Section 1.8.2.1.3.

**[A] APPROVED AGENCY.** An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.

**[HCD 1 & HCD 2]** "Approved agency" shall mean "Listing agency" and "Testing agency".

**APPROVED FABRICATOR.** An established and qualified person, firm or corporation approved by the building official pursuant to Chapter 17 of this code.

**APPROVED LISTING AGENCY.** [HCD 1 & HCD 2] Any agency approved by the enforcing agency, unless otherwise provided by law, which is in the business of listing and labeling and which makes available at least an annual published report of such listings in which specific information is included that the product has been tested to recognized standards and found to comply.

**APPROVED SOURCE.** An independent person, firm or corporation, approved by the building official, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

**APPROVED TESTING AGENCY.** [HCD 1, HCD 2 & DSA-AC] Any agency, which is determined by the enforcing agency, except as otherwise provided by law, to have adequate personnel and expertise to carry out the testing of systems, materials, types of construction, fixtures or appliances.

**ARCHITECTURAL TERRA COTTA.** Plain or ornamental hard-burned modified clay units, larger in size than brick, with glazed or unglazed ceramic finish.

**AREA (for masonry).**

**Gross cross-sectional.** The area delineated by the out-to-out specified dimensions of masonry in the plane under consideration.

**Net cross-sectional.** The area of masonry units, grout and mortar crossed by the plane under consideration based on out-to-out specified dimensions.

**AREA, BUILDING.** The area included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

**AREA OF REFUGE.** An area where persons unable to use stairways can remain temporarily to await instructions or assistance during emergency evacuation.

**AREA OF SPORT ACTIVITY.** [DSA-AC] That portion of a room or space where the play or practice of a sport occurs.

**AREAWAY.** A subsurface space adjacent to a building open at the top or protected at the top by a grating or guard.

**ASSEMBLY AREA.** [DSA-AC] A building or facility, or portion thereof, used for the purpose of entertainment, educational or civic gatherings, or similar purposes. For the purposes of these requirements, assembly areas include, but are not limited to, classrooms, lecture halls, courtrooms, public meeting rooms, public hearing rooms, legislative chambers, motion picture houses, auditoria, theaters, playhouses, dinner theaters, concert halls, centers for the performing arts, amphitheaters, arenas, stadiums, grandstands or convention centers.

**ASSEMBLY SEATING, MULTILEVEL.** See "Multilevel assembly seating."

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**ASSISTIVE DEVICE.** [HCD 1-AC] An aid, tool or instrument used by persons with disabilities to assist in activities of daily living.

**ASSISTIVE LISTENING SYSTEM (ALS).** [DSA-AC] An amplification system utilizing transmitters, receivers and coupling devices to bypass the acoustical space between a sound source and a listener by means of induction loop, radio frequency, infrared or direct-wired equipment.

**AT-GRADE STATION.** [SFM] (See Chapter 4, Section 433 for definition of term.)

**atrium.** An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

**attic.** The space between the ceiling beams of the top story and the roof rafters.

**[F] AUDIBLE ALARM NOTIFICATION APPLIANCE.** A notification appliance that alerts by the sense of hearing.

**AUTOCLAVED AERATED CONCRETE (AAC).** Low density cementitious product of calcium silicate hydrates, whose material specifications are defined in ASTM C 1386.

**[F] AUTOMATIC.** As applied to fire protection devices, a device or system providing an emergency function without the necessity for human intervention and activated as a result of a predetermined temperature rise, rate of temperature rise or combustion products.

**AUTOMATIC DOOR.** A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat or manual switch.

**[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM.** An approved system of devices and equipment which automatically detects a fire and discharges an approved fire-extinguishing agent onto or in the area of a fire.

**[F] AUTOMATIC SMOKE DETECTION SYSTEM.** A fire alarm system that has initiation devices that utilize smoke detectors for protection of an area such as a room or space with detectors to provide early warning of fire.

**[F] AUTOMATIC SPRINKLER SYSTEM.** An automatic sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which automatic sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.

**AUTOMATIC TELLER MACHINE (ATM).** [DSA-AC] Any electronic information processing device that accepts or dispenses cash in connection with a credit, deposit or convenience account. The term does not include devices used solely to facilitate check guarantees or check authorizations, or which are used in connection with the acceptance or dispensing of cash on a person-to-person basis, such as by a store cashier.

**AUXILIARY AREA.** A public dressing, locker, shower or toilet area or building space intended to be used by bathers.

**[F] AVERAGE AMBIENT SOUND LEVEL.** The root mean square, A-weighted sound pressure level measured over a 24-hour period, or the time any person is present, whichever time period is less.

**awning.** An architectural projection that provides weather protection, identity or decoration and is partially or wholly supported by the building to which it is attached. An awning is comprised of a lightweight frame structure over which a covering is attached.

**BACKING.** The wall or surface to which the veneer is secured.

**BACKWASH.** Is the process of thoroughly cleansing the filter media and/or elements and the contents of the filter vessel.

**[F] BALED COTTON.** A natural seed fiber wrapped in and secured with industry accepted materials, usually consisting of burlap, woven polypropylene, polyethylene or cotton or sheet polyethylene, and secured with steel, synthetic or wire bands or wire; also includes linters (lint removed from the cottonseed) and motes (residual materials from the ginning process).

**[F] BALED COTTON, DENSELY PACKED.** Cotton made into banded bales with a packing density of at least 22 pounds per cubic foot ( $360 \text{ kg/m}^3$ ), and dimensions complying with the following: a length of 55 inches (1397 mm), a width of 21 inches (533.4 mm) and a height of 27.6 to 35.4 inches (701 to 899 mm).

**BALLAST.** In roofing, ballast comes in the form of large stones or paver systems or light-weight interlocking paver systems and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

**[F] BARRICADE.** A structure that consists of a combination of walls, floor and roof, which is designed to withstand the rapid release of energy in an explosion and which is fully confined, partially vented or fully vented; or other effective method of shielding from explosive materials by a natural or artificial barrier.

**Artificial barricade.** An artificial mound or revetment a minimum thickness of 3 feet (914 mm).

**Natural barricade.** Natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures that require protection cannot be seen from the magazine or building containing explosives when the trees are bare of leaves.

**BASE FLOOD.** The flood having a 1-percent chance of being equaled or exceeded in any given year.

**BASE FLOOD ELEVATION.** The elevation of the base flood, including wave height, relative to the National Geodetic Vertical Datum (NGVD), North American Vertical

Datum (NAVD) or other datum specified on the *Flood Insurance Rate Map* (FIRM).

**BASEMENT (for flood loads).** The portion of a building having its floor subgrade (below ground level) on all sides. This definition of "Basement" is limited in application to the provisions of Section 1612.

**BASEMENT.** A story that is not a story above grade plane (see "Story above grade plane"). This definition of "Basement" does not apply to the provisions of Section 1612 for flood loads.

**BATHER.** *A person using a pool and adjoining deck areas for the purpose of water sports such as diving, swimming, wading or related activities.*

**BATHROOM.** *For the purposes of Chapters 11A and 11B, a room which includes a water closet (toilet), a lavatory, and a bathtub and/or a shower. It does not include single-fixture facilities or those with only a water closet and lavatory. It does include a compartmented bathroom. A compartmented bathroom is one in which the fixtures are distributed among interconnected rooms. A compartmented bathroom is considered a single unit and is subject to the requirements of Chapters 11A and 11B.*

**BEARING WALL STRUCTURE.** A building or other structure in which vertical loads from floors and roofs are primarily supported by walls.

**BED JOINT.** The horizontal layer of mortar on which a masonry unit is laid.

**BEDRIDDEN PERSON.** *A person, requiring assistance in turning and repositioning in bed, or being unable to independently transfer to and from bed, except in facilities with appropriate and sufficient care staff, mechanical devices if necessary, and safety precautions as determined in Title 22 regulations, by the Director of Social Services or his or her designated representative. Persons who are unable to independently transfer to and from bed, but who do not need assistance to turn or reposition in bed, shall be considered nonambulatory.*

*The Director of Social Services or his or her designated representative shall make the determination of the bedridden status of persons with developmental disabilities, in consultation with the Director of Developmental Services or his or her designated representative.*

*The Director of Social Services or his or her designated representative shall make the determination of the bedridden status of all other persons with disabilities who are not developmentally disabled.*

**BLEACHERS.** Tiered seating supported on a dedicated structural system and two or more rows high and is not a building element (see "Grandstands").

**BLENDDED TRANSITION. [DSA-AC]** *A raised pedestrian street crossing, depressed corner or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less.*

**BOARDING HOUSE.** A building arranged or used for lodging for compensation, with or without meals, and not occupied as a single-family unit.

**BOARDING PIER. [DSA-AC]** *A portion of a pier where a boat is temporarily secured for the purpose of embarking or disembarking.*

**BOAT LAUNCH RAMP. [DSA-AC]** *A sloped surface designed for launching and retrieving trailered boats and other water craft to and from a body of water.*

**BOAT SLIP. [DSA-AC]** *That portion of a pier, main pier, finger pier or float where a boat is moored for the purpose of berthing, embarking or disembarking.*

**[F] BOILING POINT.** The temperature at which the vapor pressure of a liquid equals the atmospheric pressure of 14.7 pounds per square inch (psia) (101 kPa) or 760 mm of mercury. Where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for the purposes of this classification, the 20-percent evaporated point of a distillation performed in accordance with ASTM D 86 shall be used as the boiling point of the liquid.

**BOND BEAM.** A horizontal grouted element within masonry in which reinforcement is embedded.

**BRACED WALL LINE.** A series of braced wall panels in a single story that meets the requirements of Section 2308.3 or 2308.12.4.

**BRACED WALL PANEL.** A section of wall braced in accordance with Section 2308.9.3 or 2308.12.4.

#### BRICK.

**Calcium silicate (sand lime brick).** A pressed and subsequently autoclaved unit that consists of sand and lime, with or without the inclusion of other materials.

**Clay or shale.** A solid or hollow masonry unit of clay or shale, usually formed into a rectangular prism, then burned or fired in a kiln; brick is a ceramic product.

**Concrete.** A concrete masonry unit made from Portland cement, water, and suitable aggregates, with or without the inclusion of other materials.

**[A] BUILDING.** Any structure used or intended for supporting or sheltering any use or occupancy.

*Exception: [HCD 1, HCD 2 & HCD 1-AC] For applications listed in Section 1.8.2 regulated by the Department of Housing and Community Development, "Building" shall not include the following:*

1. Any mobilehome as defined in Health and Safety Code Section 18008.
2. Any manufactured home as defined in Health and Safety Code Section 18007.
3. Any commercial modular as defined in Health and Safety Code Section 18001.8 or any special purpose commercial modular as defined in Section 18012.5.
4. Any recreational vehicle as defined in Section Health and Safety Code 18010.

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5. Any multifamily manufactured home as defined in Health and Safety Code Section 18008.7.

For additional information, see Health and Safety Code Section 18908.

**Note:** Building shall have the same meaning as defined in Health and Safety Code Section 17920 and 18908 for the applications specified in Section 1.11.

**BUILDING AREA.** See "Area, building."

**BUILDING ELEMENT.** A fundamental component of building construction, listed in Table 601, which may or may not be of fire-resistance-rated construction and is constructed of materials based on the building type of construction.

**BUILDING ENTRANCE ON AN ACCESSIBLE ROUTE.** [HCD 1-AC] An accessible entrance to a building that is connected by an accessible route to public transportation stops, to parking or passenger loading zones, or to public streets or sidewalks, if available.

**BUILDING, EXISTING.** [HCD 1 & HCD 2] A building erected prior to the adoption of this code, or one for which a legal building permit has been issued.

**BUILDING HEIGHT.** See "Height, building."

**BUILDING LINE.** The line established by law, beyond which a building shall not extend, except as specifically provided by law.

**[A] BUILDING OFFICIAL.** The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

**BUILT-UP ROOF COVERING.** Two or more layers of felt cemented together and surfaced with a cap sheet, mineral aggregate, smooth coating or similar surfacing material.

**CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE.** A structure in which the uplift is resisted by cables or webbings which are anchored to either foundations or dead men. Reinforcing cable or webbing is attached by various methods to the membrane or is an integral part of the membrane. This is not a cable-supported structure.

**CANOPY.** A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration. A canopy is permitted to be structurally independent or supported by attachment to a building on one or more sides.

**[F] CARBON DIOXIDE EXTINGUISHING SYSTEMS.** A system supplying carbon dioxide (CO<sub>2</sub>) from a pressurized vessel through fixed pipes and nozzles. The system includes a manual- or automatic-actuating mechanism.

**CARE AND SUPERVISION.** Any one or more of the following activities provided by a person or facility to meet the needs of the clients:

Assistance in dressing, grooming, bathing and other personal hygiene.

Assistance with taking medication.

Central storing and/or distribution of medications.

Arrangement of and assistance with medical and dental care.

Maintenance of house rules for the protection of clients.

Supervision of client schedules and activities.

Maintenance and/or supervision of client cash resources or property.

Monitoring food intake or special diets.

Providing basic services required by applicable law and regulation to be provided by the licensee in order to obtain and maintain a community-care facility license.

**CARE SUITE.** A group of treatment rooms, care recipient sleeping rooms and their associated support rooms or spaces and circulation space within Group I-2 occupancies where staff are in attendance for supervision of all care recipients within the suite, and the suite is in compliance with the requirements of Section 407.4.3.

**CARRIAGE UNIT.** [HCD 1-AC] A dwelling unit with living space on one or more floors immediately above a Group U, private garage or garages. The footprint of the garage or garages is used as the footprint for the remaining floor or floors of the units above and the garage level contains no habitable space.

**Note:** Dwelling units located over a common garage shall not be considered carriage units.

**CAST STONE.** A building stone manufactured from Portland cement concrete precast and used as a trim, veneer or facing on or in buildings or structures.

**CATASTROPHICALLY INJURED.** As termed, means a person whose origin of disability was acquired through trauma or nondegenerative neurologic illness, for whom it has been determined by the Department of Health Services Certification and Licensing that active rehabilitation would be beneficial.

**CATCH POOL.** [DSA-AC] A pool or designated section of a pool used as a terminus for water slide flumes.

**CCR.** [DSA-AC] The California Code of Regulations.

**CDF DIRECTOR.** [SFM] (See Chapter 7A, Section 702A for defined term.)

**[F] CEILING LIMIT.** The maximum concentration of an air-borne contaminant to which one may be exposed. The ceiling limits utilized are those published in DOL 29 CFR Part 1910.1000. The ceiling Recommended Exposure Limit (REL-C) concentrations published by the U.S. National Institute for Occupational Safety and Health (NIOSH), Threshold Limit Value—Ceiling (TLV-C) concentrations published by the American Conference of Governmental Industrial Hygienists (ACGIH), Ceiling Work place Environmental Exposure Level (WEEL-Ceiling) Guides published by the American Industrial Hygiene Association (AIHA), and other approved, consistent measures are allowed as surrogates for hazardous substances not listed in DOL 29 CFR Part 1910.1000.

**CEILING RADIATION DAMPER.** A listed device installed in a ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly to limit automatically the radiative heat transfer through an air inlet/outlet opening.

**CELL (Detention or correctional facility [SFM].** A sleeping or housing unit in a detention or correctional facility for the confinement of not more than two inmates or prisoners.

**CELL (masonry).** A void space having a gross cross-sectional area greater than 1<sup>1</sup>/<sub>2</sub> square inches (967 mm<sup>2</sup>).

**CELL COMPLEX.** A cluster or group of cells or dormitories in a jail, prison or other detention facility, together with rooms used for accessory purposes, all of which open into the cell complex, and are used for functions such as dining, counseling, exercise, classrooms, sick call, visiting, storage, staff offices, control rooms or similar functions, and interconnecting corridors all within the cell complex.

**CELL TIER.** Levels of cells vertically stacked above one another within a housing unit.

**CELL TIERS.** Cells, dormitories and accessory spaces. Cell tiers are located one level above the other, and do not exceed two levels per floor. A cell tier shall not be considered a story or mezzanine.

**CELLULAR CONCRETE. [HCD 1 & HCD 2]** A lightweight product consisting of portland cement and selected gas-forming chemicals or foaming agents which create homogeneous voids in the hardened concrete.

**CEMENT PLASTER.** A mixture of portland or blended cement, Portland cement or blended cement and hydrated lime, masonry cement or plastic cement and aggregate and other approved materials as specified in this code.

**CENTRAL CONTROL BUILDING.** A secure building within a prison where the fire and life safety systems, communication systems, security systems and exterior lighting systems are monitored and where security operations necessitate the remote locking of required means of egress or at the door with a key to maintain a high security area

**CERAMIC FIBER BLANKET.** A mineral wool insulation material made of alumina-silica fibers and weighing 4 to 10 pounds per cubic foot (pcf) (64 to 160 kg/m<sup>3</sup>).

**CERTIFICATE OF COMPLIANCE.** A certificate stating that materials and products meet specified standards or that work was done in compliance with approved construction documents.

**CHARACTERS.** Letters, numbers, punctuation marks and typographic symbols.

**CHARTER SCHOOL** A public school providing instruction from kindergarten through 12th grade, established pursuant to Education Code, Title 2, Division 4, Part 26.8, Section 47600, et seq.

**CHILD CARE CENTER.** Any facility of any capacity other than a large or small family day-care home as defined in these regulations in which less than 24-hour-per-day nonmedical supervision is provided for children in a group setting.

**CHILD OR CHILDREN.** A person or persons under the age of 18 years.

**CHILDREN'S USE. [DSA-AC]** Describes spaces and elements specifically designed for use primarily by people 12 years old and younger.

**[M] CHIMNEY.** A primarily vertical enclosure containing one or more passageways for conveying flue gases to the outside atmosphere.

**CHIMNEY TYPES.**

**High-heat appliance type.** An approved chimney for removing the products of combustion from fuel-burning, high-heat appliances producing combustion gases in excess of 2000°F (1093°C) measured at the appliance flue outlet (see Section 2113.11.3).

**Low-heat appliance type.** An approved chimney for removing the products of combustion from fuel-burning, low-heat appliances producing combustion gases not in excess of 1000°F (538°C) under normal operating conditions, but capable of producing combustion gases of 1400°F (760°C) during intermittent forces firing for periods up to 1 hour. Temperatures shall be measured at the appliance flue outlet.

**Masonry type.** A field-constructed chimney of solid masonry units or stones.

**Medium-heat appliance type.** An approved chimney for removing the products of combustion from fuel-burning, medium-heat appliances producing combustion gases not exceeding 2000°F (1093°C) measured at the appliance flue outlet (see Section 2113.11.2).

**CHRONICALLY ILL.** See "Terminally ill."

**CIRCULATION PATH.** An exterior or interior way of passage from one place to another for pedestrians. [DSA-AC] An exterior or interior way of passage provided for pedestrian travel, including but not limited to, walks, hallways, courtyards, elevators, platform lifts, ramps, stairways and landings.

**[F] CLEAN AGENT.** Electrically nonconducting, volatile or gaseous fire extinguishant that does not leave a residue upon vaporization.

**CLEANOUT.** An opening to the bottom of a grout space of sufficient size and spacing to allow the removal of debris.

**CLEAN POOL WATER.** Is a pool water that is free of dirt, oils, scum, algae, floating materials or other visible organic and inorganic materials that would sully the water.

**CLEAR. [DSA-AC]** Unobstructed.

**CLEAR FLOOR SPACE. [DSA-AC]** The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

**CLEAR POOL WATER.** Pool water that is free from cloudiness and is transparent.

**CLINIC, OUTPATIENT.** Buildings or portions thereof used to provide medical care on less than a 24-hour basis to persons who are not rendered incapable of self-preservation by the services provided.

**CLOSED-CIRCUIT TELEPHONE. [DSA-AC]** A telephone with a dedicated line such as a house phone, courtesy phone or phone that must be used to gain entry to a facility.

**[F] CLOSED SYSTEM.** The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product con-

## DEFINITIONS

veyed through a piping system into a closed vessel, system or piece of equipment.

**COLLAR JOINT.** Vertical longitudinal space between wythes of masonry or between masonry wythe and backup construction that is permitted to be filled with mortar or grout.

**COLLECTOR.** A horizontal diaphragm element parallel and in line with the applied force that collects and transfers diaphragm shear forces to the vertical elements of the lateral-force-resisting system and/or distributes forces within the diaphragm.

**COMBINATION FIRE/SMOKE DAMPER.** A listed device installed in ducts and air transfer openings designed to close automatically upon the detection of heat and resist the passage of flame and smoke. The device is installed to operate automatically, controlled by a smoke detection system, and where required, is capable of being positioned from a fire command center

**[F] COMBUSTIBLE DUST.** Finely divided solid material that is 420 microns or less in diameter and which, when dispersed in air in the proper proportions, could be ignited by a flame, spark or other source of ignition. Combustible dust will pass through a U.S. No. 40 standard sieve.

**[F] COMBUSTIBLE FIBERS.** Readily ignitable and free-burning materials in a fibrous or shredded form, such as cocoa fiber, cloth, cotton, excelsior, hay, hemp, henequen, istle, jute, kapok, oakum, rags, sisal, Spanish moss, straw, tow, wastepaper, certain synthetic fibers or other like materials. This definition does not include densely packed baled cotton.

**[F] COMBUSTIBLE LIQUID.** A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:

**Class II.** Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

**Class IIIA.** Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

**Class IIIB.** Liquids having a closed cup flash point at or above 200°F (93°C).

The category of combustible liquids does not include compressed gases or cryogenic fluids.

**COMMERCIAL FACILITIES [DSA-AC]** Facilities whose operations will affect commerce and are intended for non-residential use by a private entity. Commercial facilities shall not include (1) facilities that are covered or expressly exempted from coverage under the Fair Housing Act of 1968, as amended (42 U.S.C. 3601 - 3631); (2) aircraft; or (3) railroad locomotives, railroad freight cars, railroad cabooses, commuter or intercity passenger rail cars (including coaches, dining cars, sleeping cars, lounge cars and food service cars), any other railroad cars described in Section 242 of the Americans With Disabilities Act or covered under Title II of the Americans With Disabilities Act, or railroad rights-of-way. For purposes of this definition, "rail" and "railroad" have the meaning given the term "railroad" in Section 202(e)

of the Federal Railroad Safety Act of 1970 (45 U.S.C. 431(e)).

**COMMON PATH OF EGRESS TRAVEL.** That portion of exit access which the occupants are required to traverse before two separate and distinct paths of egress travel to two exits are available. Paths that merge are common paths of travel. Common paths of egress travel shall be included within the permitted travel distance.

**COMMON USE.** Interior or exterior circulation paths, rooms, spaces or elements that are not for public use and are made available for the shared use of two or more people.

**COMMON USE AREAS. [HCD 1-AC]** Private use areas within multifamily residential facilities where the use of these areas is limited exclusively to owners, residents and their guests. The areas may be defined as rooms or spaces or elements inside or outside of a building.

**COMMUNITY CARE FACILITY.** Any facility, place or building that is maintained and operated to provide nonmedical residential care, day treatment, adult day care or foster family agency services for children, adults, or children and adults, including, but not limited to, the physically handicapped, mentally impaired, incompetent persons, and abused or neglected children, and includes the following as defined in Health and Safety Code Section 1502:

1. Residential facility
2. Adult day program
3. Therapeutic day services facility
4. Foster family agency
5. Foster family home
6. Small-family home
7. Social rehabilitation facility
8. Community treatment facility
9. Full-service adoption agency
10. Noncustodial adoption agency
11. Transitional shelter care facility
12. Transitional housing placement facility

**COMPLY WITH. [DSA-AC]** Comply with means to meet one or more provisions of this code.

**[F] COMPRESSED GAS.** A material, or mixture of materials, that:

1. Is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure; and
2. Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C).

The states of a compressed gas are categorized as follows:

1. Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the

- charged pressure and are entirely gaseous at a temperature of 68°F (20°C).
2. Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C).
  3. Compressed gases in solution are nonliquefied gases that are dissolved in a solvent.
  4. Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

**COMPRESSIVE STRENGTH OF MASONRY.** Maximum compressive force resisted per unit of net cross-sectional area of masonry, determined by the testing of masonry prisms

## CONCRETE

**Carbonate aggregate.** Concrete made with aggregates consisting mainly of calcium or magnesium carbonate, such as limestone or dolomite, and containing 40 percent or less quartz, chert or flint.

> || **Cellular.** See *CELLULAR CONCRETE*.

**Lightweight aggregate.** Concrete made with aggregates of expanded clay, shale, slag or slate or sintered fly ash or any natural lightweight aggregate meeting ASTM C 330 and possessing equivalent fire-resistance properties and weighing 85 to 115 pcf (1360 to 1840 kg/m<sup>3</sup>).

**Perlite.** A lightweight insulating concrete having a dry unit weight of approximately 30 pcf (480 kg/m<sup>3</sup>) made with perlite concrete aggregate. Perlite aggregate is produced from a volcanic rock which, when heated, expands to form a glass-like material of cellular structure.

**Sand-lightweight.** Concrete made with a combination of expanded clay, shale, slag, slate, sintered fly ash, or any natural lightweight aggregate meeting ASTM C 330 and possessing equivalent fire-resistance properties and natural sand. Its unit weight is generally between 105 and 120 pcf (1680 and 1920 kg/m<sup>3</sup>).

**Siliceous aggregate.** Concrete made with normal-weight aggregates consisting mainly of silica or compounds other than calcium or magnesium carbonate, which contains more than 40-percent quartz, chert or flint.

**Vermiculite.** A light weight insulating concrete made with vermiculite concrete aggregate which is laminated micaceous material produced by expanding the ore at high temperatures. When added to a Portland cement slurry the resulting concrete has a dry unit weight of approximately 30 pcf (480 kg/m<sup>3</sup>).

**CONGREGATE LIVING HEALTH FACILITY (CLHF).** As termed, is a residential home with a capacity of no more than six beds, which provides inpatient care, including the following basic services: medical supervision, 24-hour skilled nursing and supportive care, pharmacy, dietary, social recreational, and at least provides services for persons who are diagnosed with a terminal illness or who are catastrophically and severely disabled.

**CONGREGATE RESIDENCE.** Any building or portion thereof that contains facilities for living, sleeping and sanitation, as required by this code, and may include facilities for eating and cooking, for occupancy by other than a family. A congregate residence may be a shelter, convent, monastery, dormitory, fraternity or sorority house, but does not include jails, hospitals, nursing homes, hotels or lodging houses.

**[F] CONSTANTLY ATTENDED LOCATION.** A designated location at a facility staffed by trained personnel on a continuous basis where alarm or supervisory signals are monitored and facilities are provided for notification of the fire department or other emergency services.

**[A] CONSTRUCTION DOCUMENTS.** Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

**CONSTRUCTION TYPES.** See Section 602.

**Type I.** See Section 602.2.

**Type II.** See Section 602.2.

**Type III.** See Section 602.3.

**Type IV.** See Section 602.4.

**Type V.** See Section 602.5.

**[F] CONTINUOUS GAS DETECTION SYSTEM.** A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis at intervals not to exceed 30 minutes.

**[F] CONTROL AREA.** Spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used or handled. See also the definition of "Outdoor control area" in the *California Fire Code*.

**CONTROLLED LOW-STRENGTH MATERIAL.** A self-compacted, cementitious material used primarily as a backfill in place of compacted fill.

**CONVENTIONAL LIGHT-FRAME CONSTRUCTION.** A type of construction whose primary structural elements are formed by a system of repetitive wood-framing members. See Section 2308 for conventional light-frame construction provisions.

**CORNICE.** A projecting horizontal molded element located at or near the top of an architectural feature.

**CORRIDOR.** An enclosed exit access component that defines and provides a path of egress travel.

**CORROSION RESISTANCE.** The ability of a material to withstand deterioration of its surface or its properties when exposed to its environment.

**CORROSION RESISTANT.** Capable of maintaining original surface characteristics under the prolonged influence of the use environment.

**[F] CORROSIVE.** A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits

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by the method described in DOTn 49 CFR, Part 173.137, such chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.

**COURT.** An open, uncovered space, unobstructed to the sky, bounded on three or more sides by exterior building walls or other enclosing devices.

**COURTROOM DOCK.** *An area within a courtroom where persons may be restrained and are awaiting court proceedings.*

**COURTHOUSE HOLDING FACILITY [SFM].** *A room, cell, cell complex or building for the confinement of persons for the purpose of a court appearance for a period not to exceed 12 hours.*

**COVERED MALL BUILDING.** A single building enclosing a number of tenants and occupants, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices and other similar uses wherein two or more tenants have a main entrance into one or more malls. Anchor buildings shall not be considered as a part of the covered mall building. The term "covered mall building" shall include open mall buildings as defined below.

**Mall.** A roofed or covered common pedestrian area within a covered mall building that serves as access for two or more tenants and not to exceed three levels that are open to each other. The term "mall" shall include open malls as defined below.

**Open mall.** An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade shall be permitted to include open exterior balconies leading to exits discharging at grade.

**Open mall building.** Several structures housing a number of tenants, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into one or more open malls. Anchor buildings are not considered as a part of the open mall building.

**COVERED MULTIFAMILY DWELLINGS. [HCD 1-AC]** Dwelling units in buildings consisting of 3 or more dwelling units or 4 or more condominium units. Covered multifamily dwellings include dwelling units listed in Section 1102A.1. Dwelling units within a single structure separated by fire-walls do not constitute separate buildings.

*Note:* For buildings or complexes containing public housing, see Chapter 11B for provisions of the Division of the State Architect—Access Compliance (DSA-AC).

**CRIPPLE WALL.** A framed stud wall extending from the top of the foundation to the underside of floor framing for the lowest occupied floor level.

**CROSS SLOPE.** The slope that is perpendicular to the direction of travel.

**[F] CRYOGENIC FLUID.** A liquid having a boiling point lower than -150°F (-101°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101 kPa).

**CURB CUT.** An interruption of a curb at a pedestrian way, which separates surfaces that are substantially at the same elevation.

**CURB RAMP.** A sloping pedestrian way, intended for pedestrian traffic, which provides access between a walk or sidewalk and a surface located above or below an adjacent curb face.

**CUSTODIAL CARE.** Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care include occupants who evacuate at a slower rate and/or who have mental and psychiatric complications.

**DALLE GLASS.** A decorative composite glazing material made of individual pieces of glass that are embedded in a cast matrix of concrete or epoxy.

**DAMPER.** See "Ceiling radiation damper," "Combination fire/smoke damper," "Fire damper" and "Smoke damper."

**DANGEROUS.** Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation or lacks the necessary support of the ground.
2. There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the building or structure under service loads.

**[F] DAY BOX.** A portable magazine designed to hold explosive materials constructed in accordance with the requirements for a Type 3 magazine as defined and classified in Chapter 56 of the *California Fire Code*.

**DAY-CARE.** *For the purposes of these regulations, means the care of persons during any period of a 24-hour day where permanent sleeping accommodations are not provided.*

*Note:* "Daycare" shall not be construed to preclude the use of cots or mats for napping purposes, provided all employees, attendants and staff personnel are awake and on duty in the area where napping occurs.

**DAY-CARE HOME, FAMILY.** A home that regularly provides care, protection and supervision for 14 or fewer children, in the provider's own home, for periods of less than 24 hours per day, while the parents or guardians are away, and is either a large family day-care home or a small family day-care home.

**DAY-CARE HOME, LARGE FAMILY.** A provider's own home which is licensed to provide day care for periods less than 24 hours per day for nine to 14 persons, including children under the age of 10 years who reside at the home.

**DAY-CARE HOME, SMALL FAMILY.** A home which provides family day-care to eight or fewer children, including children under the age of 10 years who reside at the home, in the provider's own home, for periods of less than 24 hours per day. Small family day-care homes are exempted from state fire and life safety regulations other than those state and local standards applicable to Group R-3 occupancies. (See Health and Safety Code, Section 13143 (b).)

**DAY ROOM.** A room which is adjacent to a cell, or cell tier, or dormitory and which is used as a dining, exercise or other activity room for inmates.

**DEAD LOAD.** The weight of materials of construction incorporated into the building, including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding and other similarly incorporated architectural and structural items, and the weight of fixed service equipment, such as cranes, plumbing stacks and risers, electrical feeders, heating, ventilating and air-conditioning systems and automatic sprinkler systems.

**DECK.** Is an area surrounding a pool which is specifically constructed or installed for use by bathers.

**DECORATIVE GLASS.** A carved, leaded or Dalle glass or glazing material whose purpose is decorative or artistic, not functional; whose coloring, texture or other design qualities or components cannot be removed without destroying the glazing material and whose surface, or assembly into which it is incorporated, is divided into segments.

**[F] DECORATIVE MATERIALS.** All materials applied over the building interior finish for decorative, acoustical or other effect (such as curtains, draperies, fabrics, streamers and surface coverings), and all other materials utilized for decorative effect (such as batting, cloth, cotton, hay, stalks, straw, vines, leaves, trees, moss and similar items), including foam plastics and materials containing foam plastics. Decorative materials do not include floor coverings, ordinary window shades, interior finish and materials 0.025 inch (0.64 mm) or less in thickness applied directly to and adhering tightly to a substrate.

**DEEP FOUNDATION.** A deep foundation is a foundation element that does not satisfy the definition of a shallow foundation.

**[F] DEFLAGRATION.** An exothermic reaction, such as the extremely rapid oxidation of a flammable dust or vapor in air, in which the reaction progresses through the unburned material at a rate less than the velocity of sound. A deflagration can have an explosive effect.

**[F] DELUGE SYSTEM.** A sprinkler system employing open sprinklers attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the sprinklers. When this valve opens, water flows into the piping system and discharges from all sprinklers attached thereto.

**DEPARTMENT. [HCD 1 & HCD 2]** The Department of Housing and Community Development.

**DESIGN DISPLACEMENT.** See Section 1905.1.1.

**DESIGN EARTHQUAKE GROUND MOTION.** The earthquake ground motion that buildings and structures are specifically proportioned to resist in Section 1613.

**DESIGN FLOOD.** The flood associated with the greater of the following two areas:

1. Area with a flood plain subject to a 1-percent or greater chance of flooding in any year; or
2. Area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.

**DESIGN FLOOD ELEVATION.** The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood eleva-

tion shall be the elevation of the highest existing grade of the building's perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).

**DESIGN PROFESSIONAL, REGISTERED.** See "Registered design professional."

**DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE, REGISTERED.** See "Registered design professional in responsible charge."

**DESIGN STRENGTH.** The product of the nominal strength and a resistance factor (or strength reduction factor).

**DESIGNATED PUBLIC TRANSPORTATION. [DSA-AC]** Transportation provided by a public entity (other than public school transportation) by bus, rail, or other conveyance (other than transportation by aircraft or intercity or commuter rail transportation) that provides the general public with general or special service, including charter service, on a regular and continuing basis.

**DESIGNATED SEISMIC SYSTEM.** Those nonstructural components that require design in accordance with Chapter 13 of ASCE 7 and for which the component importance factor,  $I_p$ , is greater than 1 in accordance with Section 13.1.3 of ASCE 7.

**DESTINATION-ORIENTED ELEVATOR. [DSA-AC]** Destination-oriented elevators are operated by the user selecting a destination floor at a hall call console located at or near an elevator landing. The destination-oriented elevator system then assigns an elevator car which transports the user to the selected destination floor. Destination-oriented elevators do not provide floor selection within elevator cars.

**[F] DETACHED BUILDING.** A separate single-story building, without a basement or crawl space, used for the storage or use of hazardous materials and located an approved distance from all structures.

**DETACHED SINGLE-FAMILY DWELLING. [HCD 1 & HCD 2]** Any single-family dwelling which is separated (detached) from adjacent buildings.

**DETAILED PLAIN CONCRETE STRUCTURAL WALL.** See Section 1905.1.1

**DETECTABLE WARNING.** A standardized surface feature built in or applied to walking surfaces or other elements to warn of hazards on a circulation path.

**[F] DETECTOR, HEAT.** A fire detector that senses heat—either abnormally high temperature or rate of rise, or both.

**DETENTION ELEVATOR [SFM].** Detention elevator shall mean an elevator which moves in-custody individuals within a secure and restrained environment.

**DETENTION TREATMENT ROOM. [SFM].** Detention treatment room shall mean a lockable room or rooms within Group I-3 occupancies used for recreational therapy, group rooms, interdisciplinary treatment team rooms, and interview rooms not classified solely as a Group I-2 occupancy.

**[F] DETONATION.** An exothermic reaction characterized by the presence of a shock wave in the material which establishes and maintains the reaction. The reaction zone progresses through the material at a rate greater than the velocity of sound. The principal heating mechanism is one of shock compression. Detonations have an explosive effect.

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**DETOXIFICATION FACILITIES.** Facilities that provide treatment for substance abuse, serving care recipients who are incapable of self-preservation or who are harmful to themselves or others.

**DIAPHRAGM.** A horizontal or sloped system acting to transmit lateral forces to the vertical-resisting elements. When the term "diaphragm" is used, it shall include horizontal bracing systems.

**Diaphragm, blocked.** In light-frame construction, a diaphragm in which all sheathing edges not occurring on a framing member are supported on and fastened to blocking.

**Diaphragm boundary.** In light-frame construction, a location where shear is transferred into or out of the diaphragm sheathing. Transfer is either to a boundary element or to another force-resisting element.

**Diaphragm chord.** A diaphragm boundary element perpendicular to the applied load that is assumed to take axial stresses due to the diaphragm moment.

**Diaphragm flexible.** A diaphragm is flexible for the purpose of distribution of story shear and torsional moment where so indicated in Section 12.3.1 of ASCE 7.

**Diaphragm, rigid. [DSA-SS, DSA-SS/CC & OSHPD 1 & 4]** A diaphragm is rigid for the purpose of distribution of story shear and torsional moment where so indicated in Section 12.3.1 of ASCE 7.

**Diaphragm, rigid.** A diaphragm is rigid for the purpose of distribution of story shear and torsional moment when the lateral deformation of the diaphragm is less than or equal to two times the average story drift.

**Diaphragm, unblocked.** A diaphragm that has edge nailing at supporting members only. Blocking between supporting structural members at panel edges is not included. Diaphragm panels are field nailed to supporting members.

## DIMENSIONS.

**Nominal.** The specified dimension plus an allowance for the joints with which the units are to be laid. Nominal dimensions are usually stated in whole numbers. Thickness is given first, followed by height and then length.

**Specified.** Dimensions specified for the manufacture or construction of a unit, joint element.

**DIRECT ACCESS.** A path of travel from a space to an immediately adjacent space through an opening in the common wall between the two spaces.

**DIRECTIONAL SIGN. [DSA-AC, HCD 1 & HCD 2]** A publicly displayed notice which indicates by use of words or symbols a recommended direction or route of travel.

**DISABILITY [DSA-AC]** Disability is (1) a physical or mental impairment that limits one or more of the major life activities of an individual, (2) a record of such an impairment, or (3) being regarded as having such an impairment.

**[F] DISPENSING.** The pouring or transferring of any material from a container, tank or similar vessel, whereby vapors, dusts, fumes, mists or gases are liberated to the atmosphere.

**DOOR, BALANCED.** A door equipped with double-pivoted hardware so designed as to cause a semicounter balanced swing action when opening.

**DORMITORY.** A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories or fraternity houses. *[SFM] For Group I-3 occupancies "Dormitory" is an area occupied by no less than three inmates.*

**DRAFTSTOP.** A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

**DRAG STRUT.** See "Collector."

**DRAIN.** A fitting or fixture, usually at or near the bottom of a pool, through which water leaves the pool normally to the recirculation pump.

**DRILLED SHAFT.** A drilled shaft is a cast-in-place deep foundation element constructed by drilling a hole (with or without permanent casing) into soil or rock and filling it with fluid concrete.

**Socketed drilled shaft.** A socketed drilled shaft is a drilled shaft with a permanent pipe or tube casing that extends down to bedrock and an uncased socket drilled into the bedrock.

**[F] DRY-CHEMICAL EXTINGUISHING AGENT.** A powder composed of small particles, usually of sodium bicarbonate, potassium bicarbonate, urea-potassium-based bicarbonate, potassium chloride or monoammonium phosphate, with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking) and the proper flow capabilities.

**DRY FLOODPROOFING.** A combination of design modifications that results in a building or structure, including the attendant utility and sanitary facilities, being water tight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7.

**DURATION OF LOAD.** The period of continuous application of a given load, or the aggregate of periods of intermittent applications of the same load.

**DWELLING.** A building that contains one or two dwelling units used, intended or designed to be used, rented, leased, let or hired out to be occupied for living purposes.

**DWELLING UNIT.** A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. *[HCD 1-AC] For the purposes of Chapter 11A, a single unit of residence for a family of one or more persons. Examples of dwelling units covered by Chapter 11A include condominiums, an apartment unit within an apartment building, and other types of dwellings in which sleeping accommodations are provided but toileting or cooking facilities are shared by occupants of more than one room or portion of the dwelling. Examples of the latter include dormitory rooms and sleeping accommodations in shelters intended for occupancy as residences for homeless persons.*

**DWELLING UNIT OR SLEEPING UNIT, MULTISTORY.** See definition for "Multistory unit."

**EFFICIENCY DWELLING UNIT. [HCD 1]** A dwelling unit containing only one habitable room and includes an effi-

ciency unit as defined by Health and Safety Code Section 17958.1. See Section 1208.4.

**EFFECTIVE PARTICLE SIZE.** The theoretical size of a sieve in mm that will pass 10 percent by weight of sand.

**EGRESS COURT.** A court or yard which provides access to a public way for one or more exits.

|| **ELECTRIC VEHICLE.** See Section 406.9.

**ELEMENT.** [DSA-AC] An architectural or mechanical component of a building, facility, space or site.

**ELEVATED PLAY COMPONENT.** [DSA-AC] A play component that is approached above or below grade and that is part of a composite play structure consisting of two or more play components attached or functionally linked to create an integrated unit providing more than one play activity.

**ELEVATED STATION.** [SFM] (See Chapter 4, Section 433 for definition of term.)

[F] **ELEVATOR GROUP.** A grouping of elevators in a building located adjacent or directly across from one another that responds to common hall call buttons.

**ELEVATOR, PASSENGER.** [HCD 1 & HCD 2] See "PASSENGER ELEVATOR." [DSA-AC] An elevator used primarily to carry passengers.

[F] **EMERGENCY ALARM SYSTEM.** A system to provide indication and warning of emergency situations involving hazardous materials.

[F] **EMERGENCY CONTROL STATION.** An approved location on the premises where signals from emergency equipment are received and which is staffed by trained personnel.

**EMERGENCY ESCAPE AND RESCUE OPENING.** An operable window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

**EMERGENCY MANAGEMENT PANEL (EMP).** [SFM] (See Chapter 4, Section 433 for definition of term.)

[F] **EMERGENCY VOICE/ALARM COMMUNICATIONS.** Dedicated manual or automatic facilities for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building.

**EMPLOYEE WORK AREA.** All or any portion of a space used only by employees and only for work. Corridors, toilet rooms, kitchenettes and break rooms are not employee work areas.

**ENCLOSED STATION.** [SFM] (See Chapter 4, Section 433 for definition of term.)

**ENFORCEMENT.** [HCD 1 & HCD 2] The applicable section of the Health and Safety Code is repeated here for clarity and reads as follows:

**Section 17920.** "Enforcement" means diligent effort to secure compliance, including review of plans and permit applications, response to complaints, citation of violations, and other legal process. Except as otherwise pro-

vided in this part, "enforcement" may, but need not, include inspections of existing buildings on which no complaint or permit application has been filed, and effort to secure compliance as to these existing buildings.

**ENFORCEMENT AGENT.** [DSA-SS, DSA-SS/CC & OSHPD 1 & 4] That individual within the agency or organization charged with responsibility for agency or organization compliance with the requirements of this Code. Used interchangeably with Building Official and Code Official.

**ENFORCING AGENCY.** (DSA-AC, HCD 1 & HCD 2) Enforcing Agency is the designated department or agency as specified by statute or regulation.

**ENGINEERING ANALYSIS (FIRE HAZARD/FIRE RISK ASSESSMENT).** [SFM] (See Chapter 4, Section 433 for definition of term.)

**ENTRANCE.** Any access point to a building or portion of a building or facility used for the purpose of entering. An entrance includes the approach walk, the vertical access leading to the entrance platform, the entrance platform itself, vestibule if provided, the entry door or gate, and the hardware of the entry door or gate.

**ENTRANCE, PUBLIC.** See "Public entrance."

**ENTRANCE, RESTRICTED.** See "Restricted entrance."

**ENTRANCE, SERVICE.** See "Service entrance."

**EQUIPMENT PLATFORM.** An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs, alternating tread devices and ladders necessary to access the platform (see Section 505.3).

**EQUIPMENT AREA.** An area used for pool recirculation and purification equipment and related piping appurtenances.

**EQUIVALENT FACILITATION.** The use of designs, products or technologies as alternatives to those prescribed, resulting in substantially equivalent or greater accessibility and usability.

**Note:** In determining equivalent facilitation, consideration shall be given to means that provide for the maximum independence of persons with disabilities while presenting the least risk of harm, injury or other hazard to such persons or others.

**ESSENTIAL FACILITIES.** Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes

[F] **EXHAUSTED ENCLOSURE.** An appliance or piece of equipment that consists of a top, a back and two sides providing a means of local exhaust for capturing gases, fumes, vapors and mists. Such enclosures include laboratory hoods, exhaust fume hoods and similar appliances and equipment used to locally retain and exhaust the gases, fumes, vapors and mists that could be released. Rooms or areas provided with general ventilation, in themselves, are not exhausted enclosures.

## DEFINITIONS

**EXISTING BUILDING OR FACILITY.** [DSA-AC] A facility in existence on any given date, without regard to whether the facility may also be considered newly constructed or altered under this code.

**EXISTING CONSTRUCTION.** Any buildings and structures for which the start of construction commenced before the effective date of the community's first flood plain management code, ordinance or standard. "Existing construction" is also referred to as "existing structures."

**EXISTING STRUCTURE (For Section 1612.2).** See "Existing construction".

**EXISTING STRUCTURE (For Chapter 34).** A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.

**EXIT.** That portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways, interior exit ramps, exit passageways, exterior exit stairways and exterior exit ramps and horizontal exits.

**EXIT ACCESS.** That portion of a means of egress system that leads from any occupied portion of a building or structure to an exit.

**EXIT ACCESS DOORWAY.** A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, exit access stair or exit access ramp.

**EXIT ACCESS RAMP.** An interior ramp that is not a required interior exit ramp.

**EXIT ACCESS STAIRWAY.** An interior stairway that is not a required interior exit stairway.

**EXIT DISCHARGE.** That portion of a means of egress system between the termination of an exit and a public way.

**EXIT DISCHARGE, LEVEL OF.** The story at the point at which an exit terminates and an exit discharge begins.

**EXIT HARDWARE, FIRE.** See "Fire exit hardware."

**EXIT, HORIZONTAL.** A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.

**EXIT PASSAGEWAY.** An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to an exit or to the exit discharge.

**EXPANDED VINYL WALL COVERING.** Wall covering consisting of a woven textile backing, an expanded vinyl base coat layer and a nonexpanded vinyl skin coat. The expanded base coat layer is a homogeneous vinyl layer that contains a blowing agent. During processing, the blowing agent decomposes, causing this layer to expand by forming closed cells.

The total thickness of the wall covering is approximately 0.055 inch to 0.070 inch (1.4 mm to 1.78 mm).

**[F] EXPLOSION.** An effect produced by the sudden violent expansion of gases, which may be accompanied by a shock wave or disruption, or both, of enclosing materials or structures. An explosion could result from any of the following:

1. Chemical changes such as rapid oxidation, deflagration or detonation, decomposition of molecules and runaway polymerization (usually detonations).
2. Physical changes such as pressure tank ruptures.
3. Atomic changes (nuclear fission or fusion).

**[F] EXPLOSIVE.** A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G.

The term "explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.

**High explosive.** Explosive material, such as dynamite, which can be caused to detonate by means of a No. 8 test blasting cap when unconfined.

**Low explosive.** Explosive material that will burn or deflagrate when ignited. It is characterized by a rate of reaction that is less than the speed of sound. Examples of low explosives include, but are not limited to, black powder; safety fuse; igniters; igniter cord; fuse lighters; fireworks, 1.3G and propellants, 1.3C.

**Mass-detonating explosives.** Division 1.1, 1.2 and 1.5 explosives alone or in combination, or loaded into various types of ammunition or containers, most of which can be expected to explode virtually instantaneously when a small portion is subjected to fire, severe concussion, impact, the impulse of an initiating agent or the effect of a considerable discharge of energy from without. Materials that react in this manner represent a mass explosion hazard. Such an explosive will normally cause severe structural damage to adjacent objects. Explosive propagation could occur immediately to other items of ammunition and explosives stored sufficiently close to and not adequately protected from the initially exploding pile with a time interval short enough so that two or more quantities must be considered as one for quantity-distance purposes.

**UN/DOTn Class 1 explosives.** The former classification system used by DOTn included the terms "high" and "low" explosives as defined herein. The following terms further define explosives under the current system applied by DOTn for all explosive materials defined as hazard Class 1 materials. Compatibility group letters are used in concert with the division to specify further limitations on each division noted (i.e., the letter G identifies the material as a pyrotechnic substance or article containing a pyrotechnic substance and similar materials).

**Division 1.1.** Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

**Division 1.2.** Explosives that have a projection hazard but not a mass explosion hazard.

**Division 1.3.** Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

**Division 1.4.** Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

**Division 1.5.** Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard, but that are so insensitive there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

**Division 1.6.** Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

**EXTERIOR COVERING. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS).** EIFS are nonstructural, nonload-bearing, exterior wall cladding systems that consist of an insulation board attached either adhesively or mechanically, or both, to the substrate; an integrally reinforced base coat and a textured protective finish coat.

**EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE.** An EIFS that incorporates a means of drainage applied over a water-resistive barrier.

**EXTERIOR SURFACES.** Weather-exposed surfaces.

**EXTERIOR WALL.** A wall, bearing or nonbearing, that is used as an enclosing wall for a building, other than a fire wall, and that has a slope of 60 degrees (1.05 rad) or greater with the horizontal plane.

**EXTERIOR WALL COVERING.** A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resisting barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, facias, gutters and leaders.

**EXTERIOR WALL ENVELOPE.** A system or assembly of exterior wall components, including exterior wall finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

**F RATING.** The time period that the through-penetration firestop system limits the spread of fire through the penetra-

tion when tested in accordance with ASTM E 814 or UL 1479.

**FABRIC PARTITION.** A partition consisting of a finished surface made of fabric, without a continuous rigid backing, that is directly attached to a framing system in which the vertical framing members are spaced greater than 4 feet (1219 mm) on center.

**FABRICATED ITEM.** Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel reinforcing bars, masonry units and wood structural panels, or in accordance with a referenced standard which provides requirements for quality control done under the supervisions of a third-party quality control agency, shall not be considered "fabricated items."

**[F] FABRICATION AREA.** An area within a semiconductor fabrication facility and related research and development areas in which there are processes using hazardous production materials. Such areas are allowed to include ancillary rooms or areas such as dressing rooms and offices that are directly related to the fabrication area processes.

**FACILITY.** All or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes located on a site. *[DSA-AC] All or any portion of buildings, structures, site improvements, elements, and pedestrian routes or vehicular ways located on a site.*

**FACTORED LOAD.** The product of a nominal load and a load factor.

**FAMILY [HCD 1].** An individual or two or more persons who are related by blood or marriage; or otherwise live together in a dwelling unit.

**FIBER-CEMENT SIDING.** A manufactured, fiber-reinforcing product made with an inorganic hydraulic or calcium silicate binder formed by chemical reaction and reinforced with discrete organic or inorganic nonasbestos fibers, or both. Additives that enhance manufacturing or product performance are permitted. Fiber-cement siding products have either smooth or textured faces and are intended for exterior wall and related applications.

**FIBER-REINFORCED POLYMER.** A polymeric composite material consisting of reinforcement fibers, such as glass, impregnated with a fiber-binding polymer which is then molded and hardened. Fiber-reinforced polymers are permitted to contain cores laminated between fiber-reinforced polymer facings.

**FIBERBOARD.** A fibrous, homogeneous panel made from lignocellulosic fibers (usually wood or cane) and having a density of less than 31 pounds per cubic foot (pcf) (497 kg/m<sup>3</sup>) but more than 10 pcf (160 kg/m<sup>3</sup>).

**FIELD NAILING.** See "Nailing, field."

**[F] FIRE ALARM BOX, MANUAL.** See "Manual fire alarm box."

## DEFINITIONS

**[F] FIRE ALARM CONTROL UNIT.** A system component that receives inputs from automatic and manual fire alarm devices and may be capable of supplying power to detection devices and transponders or off-premises transmitters. The control unit may be capable of providing a transfer of power to the notification appliances and transfer of condition to relays or devices.

**[F] FIRE ALARM SIGNAL.** A signal initiated by a fire alarm-initiating device such as a manual fire alarm box, automatic fire detector, waterflow switch or other device whose activation is indicative of the presence of a fire or fire signature.

**[F] FIRE ALARM SYSTEM.** A system or portion of a combination system consisting of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals.

**FIRE APPLIANCE. [SFM]** *The apparatus or equipment provided or installed for use in the event of an emergency.*

**FIRE AREA.** The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

**FIRE BARRIER.** A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.

**[F] FIRE COMMAND CENTER.** The principal attended or unattended location where the status of detection, alarm communications and control systems is displayed, and from which the systems can be manually controlled.

**FIRE DAMPER.** A listed device installed in ducts and air transfer openings designed to close automatically upon detection of heat and resist the passage of flame. Fire dampers are classified for use in either static systems that will automatically shut down in the event of a fire, or in dynamic systems that continue to operate during a fire. A dynamic fire damper is tested and rated for closure under elevated temperature airflow.

**[F] FIRE DETECTOR, AUTOMATIC.** A device designed to detect the presence of a fire signature and to initiate action.

**FIRE DOOR.** The door component of a fire door assembly.

**FIRE DOOR ASSEMBLY.** Any combination of a fire door, frame, hardware and other accessories that together provide a specific degree of fire protection to the opening.

**FIRE DOOR ASSEMBLY, FLOOR.** See "Floor fire door assembly."

**FIRE EXIT HARDWARE.** Panic hardware that is listed for use on fire door assemblies.

**FIRE HAZARD SEVERITY ZONES. [SFM]** *(See Chapter 7A, Section 702A for defined term.)*

**[F] FIRE LANE.** A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

**FIRE PARTITION.** A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.

**FIRE PROTECTION PLAN. [SFM]** *(See Chapter 7A, Section 702A for defined term.)*

**FIRE PROTECTION RATING.** The period of time that an opening protective will maintain the ability to confine a fire as determined by tests prescribed in Section 715. Ratings are stated in hours or minutes.

**[F] FIRE PROTECTION SYSTEM.** Approved devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof.

**FIRE-RATED GLAZING.** Glazing with either a fire protection rating or a fire-resistance rating.

**FIRE RESISTANCE.** That property of materials or their assemblies that prevents or retards the passage of excessive heat, hot gases or flames under conditions of use.

**FIRE-RESISTANCE RATING.** The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703.

**FIRE-RESISTANT JOINT SYSTEM.** An assemblage of specific materials or products that are designed, tested and fire-resistance rated in accordance with either ASTM E 1966 or UL 2079 to resist for a prescribed period of time the passage of fire through joints made in or between fire-resistance-rated assemblies.

**[F] FIRE SAFETY FUNCTIONS.** Building and fire control functions that are intended to increase the level of life safety for occupants or to control the spread of harmful effects of fire.

**FIRE SEPARATION DISTANCE.** The distance measured from the building face to one of the following:

1. The closest interior lot line;
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the property.

The distance shall be measured at right angles from the face of the wall.

**FIRE-SMOKE BARRIER. [SFM]** *A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained in accordance with Section 707 and that is designed and constructed to restrict the movement of smoke in accordance with Section 710.*

**FIRE-RETARDANT TREATED WOOD. [SFM]** *See Section 2303.2.*

**FIRE WALL.** A fire-resistance-rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall.

**FIRE WINDOW ASSEMBLY.** A window constructed and glazed to give protection against the passage of fire.

**FIREBLOCKING.** Building materials, or materials approved for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces.

**FIREPLACE.** A hearth and fire chamber or similar prepared place in which a fire may be made and which is built in conjunction with a chimney.

**FIREPLACE THROAT.** The opening between the top of the firebox and the smoke chamber.

**FIRESTOP, MEMBRANE PENETRATION.** See "Membrane penetration firestop."

**FIRESTOP, PENETRATION.** See "Penetration firestop."

**FIRESTOP SYSTEM, THROUGH PENETRATION.** See "Through penetration firestop system."

**[F] FIREWORKS.** Any composition or device for the purpose of producing a visible or audible effect for entertainment purposes by combustion, deflagration or detonation that meets the definition of 1.4G fireworks or 1.3G fireworks as set forth herein.

**Fireworks, 1.3G.** Large fireworks devices, which are explosive materials, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, deflagration or detonation. Such 1.3G fireworks include, but are not limited to, firecrackers containing more than 130 milligrams (2 grains) of explosive composition, aerial shells containing more than 40 grams of pyrotechnic composition, and other display pieces which exceed the limits for classification as 1.4G fireworks. Such 1.3G fireworks are also described as fireworks, UN0335 by the DOT.

**Fireworks, 1.4G.** Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion. Such 1.4G fireworks which comply with the construction, chemical composition and labeling regulations of the DOT for fireworks, UN0336, and the U.S. Consumer Product Safety Commission (CPSC) as set forth in CPSC 16 CFR: Parts 1500 and 1507, are not explosive materials for the purpose of this code.

**FIXED BASE OPERATOR (FBO).** A commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services, such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance and flight instruction.

**FIXED GUIDEWAY TRANSIT SYSTEM (*the system*).** **[SFM]** (See Chapter 4, Section 433 for definition of term.)

**FIXED SEATING.** Furniture or fixture designed and installed for the use of sitting and secured in place including bench-type seats and seats with or without backs or arm rests.

**FLAME SPREAD.** The propagation of flame over a surface.

**FLAME SPREAD INDEX.** A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E 84 or UL 723.

**[F] FLAMMABLE GAS.** A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which:

1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or
2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit.

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E 681.

**[F] FLAMMABLE LIQUEFIED GAS.** A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.

**[F] FLAMMABLE LIQUID.** A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

**Class IA.** Liquids having a flash point below 73°F (23°C) and a boiling point below 100°F (38°C).

**Class IB.** Liquids having a flash point below 73°F (23°C) and a boiling point at or above 100°F (38°C).

**Class IC.** Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C). The category of flammable liquids does not include compressed gases or cryogenic fluids.

**[F] FLAMMABLE MATERIAL.** A material capable of being readily ignited from common sources of heat or at a temperature of 600°F (316°C) or less.

**[F] FLAMMABLE SOLID.** A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption or moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR; Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.1 inch (2.5 mm) per second along its major axis.

**[F] FLAMMABLE VAPORS OR FUMES.** The concentration of flammable constituents in air that exceed 25 percent of their lower flammable limit (LFL).

**[F] FLASH POINT.** The minimum temperature in degrees Fahrenheit at which a liquid will give off sufficient vapors to form an ignitable mixture with air near the surface or in the container, but will not sustain combustion. The flash point of a liquid shall be determined by appropriate test procedure and apparatus as specified in ASTM D 56, ASTM D 93 or ASTM D 3278.

**FLIGHT.** A continuous run of rectangular treads, winders or combination thereof from one landing to another.

**FLOOD or FLOODING.** A general and temporary condition of partial or complete inundation of normally dry land from:

1. The overflow of inland or tidal waters.

## DEFINITIONS

2. The unusual and rapid accumulation or runoff of surface waters from any source.

**FLOOD DAMAGE-RESISTANT MATERIALS.** Any construction material capable of withstanding direct and prolonged contact with floodwaters without sustaining any damage that requires more than cosmetic repair.

**FLOOD, DESIGN.** See "Design flood."

**FLOOD ELEVATION, DESIGN.** See "Design flood elevation."

**FLOOD HAZARD AREA.** The greater of the following two areas:

1. The area within a flood plain subject to a 1-percent or greater chance of flooding in any year.
2. The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.

**FLOOD HAZARD AREAS, SPECIAL.** See "Special flood hazard areas."

**FLOOD HAZARD AREA SUBJECT TO HIGH-VELOCITY WAVE ACTION.** Area within the flood hazard area that is subject to high-velocity wave action, and shown on a Flood Insurance Rate Map (FIRM) or other flood hazard map as Zone V, VO, VE or V1-30.

**FLOOD INSURANCE RATE MAP (FIRM).** An official map of a community on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

**FLOOD INSURANCE STUDY.** The official report provided by the Federal Emergency Management Agency containing the Flood Insurance Rate Map (FIRM), the Flood Boundary and Floodway Map (FBFM), the water surface elevation of the base flood and supporting technical data.

**FLOODWAY.** The channel of the river, creek or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

**FLOOR AREA, GROSS.** The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings or interior courts.

**FLOOR AREA, NET.** The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

**FLOOR FIRE DOOR ASSEMBLY.** A combination of a fire door, a frame, hardware and other accessories installed in a horizontal plane, which together provide a specific degree of fire protection to a through-opening in a fire-resistance-rated floor (see Section 711.8).

**[F] FOAM-EXTINGUISHING SYSTEM.** A special system discharging a foam made from concentrates, either mechanically or chemically, over the area to be protected.

**FOAM PLASTIC INSULATION.** A plastic that is intentionally expanded by the use of a foaming agent to produce a reduced-density plastic containing voids consisting of open or closed cells distributed throughout the plastic for thermal insulating or acoustical purposes and that has a density less than 20 pounds per cubic foot (pcf) (320 kg/m<sup>3</sup>).

**FOLDING AND TELESCOPIC SEATING.** Tiered seating having an overall shape and size that is capable of being reduced for purposes of moving or storing and is not a building element.

**FOOD COURT.** A public seating area located in the mall that serves adjacent food preparation tenant spaces.

**FOSTER CARE FACILITIES.** See *FOSTER FAMILY HOME*.

**FOSTER FAMILY HOME.** Any residential facility providing 24-hour care for six or fewer foster children that is owned, leased or rented and is the residence of the foster parent or parents, including their family, in whose care the foster children have been placed. The placement may be by a public or private child placement agency or by a court order, or by voluntary placement by a parent, parents or guardian. It also means a foster family home described in Section 1505.2.

**FOUNDATION PIER.** An isolated vertical foundation member whose horizontal dimension measured at right angles to its thickness does not exceed three times its thickness and whose height is equal to or less than four times its thickness.

**FRAME STRUCTURE.** A building or other structure in which vertical loads from floors and roofs are primarily supported by columns.

**FREESTANDING ACUTE PSYCHIATRIC BUILDING (APB).** [OSHPD 1] A freestanding building, as defined in the California Administrative Code Section 7-111, that provides 24-hour inpatient Acute Psychiatric Services as defined in the Health and Safety Code (H&SC) Section 1250(b) or as special services in accordance with H&SC Section 1255(a)(5) of a general acute care hospital defined in H&SC Section 1250(a) and all structures required for their continuous operation or access/egress.

**FREESTANDING SKILLED NURSING BUILDING (SNB).** [OSHPD 1] A freestanding building, as defined in the California Administrative Code Section 7-111, that provides skilled nursing and/or intermediate care as defined in the Health and Safety Code Section 1250(c) or (d), and all structures required for their continuous operation or access/egress.

**FULL-TIME CARE.** Shall mean the establishment and routine care of persons on an hourly, daily, weekly, monthly, yearly or permanent basis, whether for 24-hours per day or less, and where sleeping accommodations are provided.

**FUNCTIONAL AREA.** [DSA-AC] A room, space or area intended or designated for a group of related activities or processes.

**GANGWAY.** [DSA-AC] A variable-sloped pedestrian walkway that links a fixed structure or land with a floating structure. Gangways that connect to vessels are not addressed by this code.

**[F] GAS CABINET.** A fully enclosed, ventilated noncombustible enclosure used to provide an isolated environment for compressed gas cylinders in storage or use. Doors and access ports for exchanging cylinders and accessing pressure-regulating controls are allowed to be included.

**[F] GAS ROOM.** A separately ventilated, fully enclosed room in which only compressed gases and associated equipment and supplies are stored or used.

**[F] GASEOUS HYDROGEN SYSTEM.** An assembly of piping, devices and apparatus designed to generate, store, contain, distribute or transport a nontoxic, gaseous hydrogen-containing mixture having at least 95-percent hydrogen gas by volume and not more than 1-percent oxygen by volume. Gaseous hydrogen systems consist of items such as compressed gas containers, reactors and appurtenances, including pressure regulators, pressure relief devices, manifolds, pumps, compressors and interconnecting piping and tubing and controls.

**GENERAL ACUTE CARE BUILDING (GAC Building).** [OSHPD 1] Hospital buildings as defined in the California Administrative Code Section 7-111 and all structures required for their continuous operation or access/egress, except Freestanding Skilled Nursing Building (SNB) and Acute Psychiatric Building (APB).

**GLASS FIBERBOARD.** Fibrous glass roof insulation consisting of inorganic glass fibers formed into rigid boards using a binder. The board has a top surface faced with asphalt and kraft reinforced with glass fiber.

**GLUED BUILT-UP MEMBER.** A structural element, the section of which is composed of built-up lumber, wood structural panels or wood structural panels in combination with lumber, all parts bonded together with structural adhesives.

**GOLF CAR PASSAGE.** [DSA-AC] A continuous passage on which a motorized golf car can operate.

**GRAB BAR.** [DSA-AC & HCD 1-AC] A bar for the purpose of being grasped by the hand for support.

**GRADE (Adjacent Ground Elevation)** [DSA-AC & HCD 1-AC] The lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than 5 feet (1524 mm) from the building, between the building and a line 5 feet (1524 mm) from the building. See Health and Safety Code Section 19955.3(d).

**GRADE BREAK.** [DSA-AC] The line where two surface planes with different slopes meet.

**GRADE FLOOR OPENING.** A window or other opening located such that the sill height of the opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

**GRADE (LUMBER).** The classification of lumber in regard to strength and utility in accordance with American Softwood Lumber Standard DOC PS 20 and the grading rules of an approved lumber rules-writing agency.

**GRADE PLANE.** A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829 mm) from the building.

**GRADE PLANE, STORY ABOVE.** See "Story above grade plane."

**GRANDSTAND.** Tiered seating supported on a dedicated structural system and two or more rows high and is not a building element (see "Bleachers").

**GROSS LEASABLE AREA.** The total floor area designed for tenant occupancy and exclusive use. The area of tenant occupancy is measured from the centerlines of joint partitions to the outside of the tenant walls. All tenant areas, including areas used for storage, shall be included in calculating gross leasable area.

**GROUND FLOOR.** The floor of a building with a building entrance on an accessible route. A building may have one or more ground floors.

**GROUND LEVEL PLAY COMPONENT.** [DSA-AC] A play component that is approached and exited at the ground level.

**GROUP HOME.** A facility that provides 24-hour care and supervision to children, provides services specified in this chapter to a specific client group, and maintains a structured environment, with such services provided at least in part by staff employed by the licensee. The care and supervision provided by a group home shall be nonmedical except as permitted by Welfare and Institutions Code Section 17736(b). Since small-family and foster family homes, by definition, care for six or fewer children only, any facility providing 24-hour care for seven or more children must be licensed as a group home.

**GUARD [DSA-AC, HCD 1 & HCD 2] OR GUARDRAIL.** A building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

**GUIDEWAY.** [SFM] (See Chapter 4, Section 433 for definition of term.)

**GYPSUM BOARD.** Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board or water-resistant gypsum backing board complying with the standards listed in Tables 2506.2, 2507.2 and Chapter 35.

**GYPSUM PLASTER.** A mixture of calcined gypsum or calcined gypsum and lime and aggregate and other approved materials as specified in this code.

**GYPSUM VENEER PLASTER.** Gypsum plaster applied to an approved base in one or more coats normally not exceeding  $\frac{1}{4}$  inch (6.4 mm) in total thickness.

**HABITABLE SPACE.** A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.

## DEFINITIONS

**HALL CALL CONSOLE.** [DSA-AC] An elevator call user interface exclusive to a destination-oriented elevator system that requires the user to select a destination floor prior to entering the elevator car.

**[F] HALOGENATED EXTINGUISHING SYSTEM.** A fire-extinguishing system using one or more atoms of an element from the halogen chemical series: fluorine, chlorine, bromine and iodine.

**[F] HANDLING.** The deliberate transport by any means to a point of storage or use.

**HANDRAIL.** A horizontal or sloping rail intended for grasping by the hand for guidance or support.

**HANDWASHING FIXTURE.** Refer to the California Plumbing Code, Section 210.0.

**HARDBOARD.** A fibrous-felted, homogeneous panel made from lignocellulosic fibers consolidated under heat and pressure in a hot press to a density not less than 31pcf (497 kg/m<sup>3</sup>).

**[F] HAZARDOUS MATERIALS.** Those chemicals or substances that are physical hazards or health hazards as classified in Section 307 and the California Fire Code, whether the materials are in usable or waste condition.

**[F] HAZARDOUS PRODUCTION MATERIAL (HPM).** A solid, liquid or gas associated with semiconductor manufacturing that has a degree-of-hazard rating in health, flammability or instability of Class 3 or 4 as ranked by NFPA 704 and which is used directly in research, laboratory or production processes which have as their end product materials that are not hazardous.

**HAZARDOUS SUBSTANCE.** [SFM] Hazardous Substance is a substance which, by reason of being explosive, flammable, toxic, poisonous, corrosive, oxidizing, irritant or otherwise harmful, is likely to cause injury.

**HEAD JOINT.** Vertical mortar joint placed between masonry units within the wythe at the time the masonry units are laid.

**HEALTH CARE PROVIDER.** [DSA-AC] See "Professional Office of a Health Care Provider"

**[F] HEALTH HAZARD.** A classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term "health hazard" includes chemicals that are toxic or highly toxic, and corrosive.

**HEAT DETECTOR.** See "Detector, heat."

**HEAVY TIMBER.** [SFM] (See Chapter 7A, Section 702A for defined term.)

**HEIGHT, BUILDING.** The vertical distance from grade plane to the average height of the highest roof surface.

**HELICAL PILE.** Manufactured steel deep foundation element consisting of a central shaft and one or more helical bearing plates. A helical pile is installed by rotating it into the ground. Each helical bearing plate is formed into a screw thread with a uniform defined pitch.

**HELIPAD.** A structural surface that is used for the landing, taking off, taxiing and parking of helicopters.

**HELIPORT.** An area of land or water or a structural surface that is used, or intended for the use, for the landing and taking off of helicopters, and any appurtenant areas that are used, or intended for use, for heliport buildings or other heliport facilities.

**HELISTOP.** The same as "heliport," except that no fueling, defueling, maintenance, repairs or storage of helicopters is permitted.

**HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL).** Panels consisting of layers of cellulose fibrous material impregnated with thermosetting resins and bonded together by a high-pressure process to form a homogeneous nonporous core suitable for exterior use.

**HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL) SYSTEM.** An exterior wall covering fabricated using HPL in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

**HIGH-RISE BUILDING.** In other than Group I-2 occupancies "high-rise buildings" as used in this code:

*Existing high-rise structure.* A high-rise structure, the construction of which is commenced or completed prior to July 1, 1974.

*High-rise structure.* Every building of any type of construction or occupancy having floors used for human occupancy located more than 75 feet above the lowest floor level having building access (see Section 403.1.2), except buildings used as hospitals as defined in Health and Safety Code Section 1250.

*New High-rise Building.* A high-rise structure, the construction of which is commenced on or after July 1, 1974. For the purpose of this section, construction shall be deemed to have commenced when plans and specifications are more than 50 percent complete and have been presented to the local jurisdiction prior to July 1, 1974. Unless all provisions of this section have been met, the construction of such buildings shall commence on or before January 1, 1976.

*New high-rise structure.* A high-rise structure, the construction of which is commenced on or after July 1, 1974.

**HIGH-RISE BUILDING ACCESS.** An exterior door opening conforming to all of the following:

1. Suitable and available for fire department use.
2. Located not more than 2 feet (610 mm) above the adjacent ground level.
3. Leading to a space, room or area having foot traffic communication capabilities with the remainder of the building.
4. Designed to permit penetration through the use of fire department forcible-entry tools and equipment unless other approved arrangements have been made with the fire authority having jurisdiction.

**[F] HIGHLY TOXIC.** A material which produces a lethal dose or lethal concentration that falls within any of the following categories:

1. A chemical that has a median lethal dose ( $LD_{50}$ ) of 50 milligrams or less per kilogram of body weight when

- administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical that has a median lethal dose ( $LD_{50}$ ) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
  3. A chemical that has a median lethal concentration ( $LC_{50}$ ) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

Mixtures of these materials with ordinary materials, such as water, might not warrant classification as highly toxic. While this system is basically simple in application, any hazard evaluation that is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

**HISTORIC BUILDINGS.** Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law (see Sections 3409 and 3411.9). *[DSA-AC]* See "Qualified historical building or property," C.C.R., Title 24, Part 8.

**HOLDING FACILITY.** A detention or correctional facility or area where inmates, staff and public are not housed but are restrained.

**HORIZONTAL ASSEMBLY.** A fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.

**HORIZONTAL EXIT.** See "Exit, horizontal."

**HOSPITALS AND PSYCHIATRIC HOSPITALS.** Facilities that provide care or treatment for the medical, psychiatric, obstetrical, or surgical treatment of care recipients that are incapable of self-preservation.

**HOTEL OR MOTEL.** *[HCD 1 & HCD 2]* Any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied for sleeping purposes by guests.

**HOUSING AT A PLACE OF EDUCATION.** Housing operated by or on behalf of an elementary, secondary, undergraduate, or postgraduate school, or other place of education, including dormitories, suites, apartments, or other places of residence.

**HOUSING UNIT.** An area intended to lodge inmates on a 24-hour basis where accommodations are provided for sleeping.

**[F] HPM FLAMMABLE LIQUID.** An HPM liquid that is defined as either a Class I flammable liquid or a Class II or Class IIIA combustible liquid.

**[F] HPM ROOM.** A room used in conjunction with or serving a Group H-5 occupancy, where HPM is stored or used and which is classified as a Group H-2, H-3 or H-4 occupancy.

**HURRICANE-PRONE REGIONS.** Areas vulnerable to hurricanes defined as:

1. The U.S. Atlantic Ocean and Gulf of Mexico coasts where the ultimate design wind speed,  $V_{ult}$ , for Risk

Category II buildings is greater than 115 mph (51.4 m/s); and

2. Hawaii, Puerto Rico, Guam, Virgin Islands and American Samoa.

**[F] HYDROGEN FUEL GAS ROOM.** A room or space that is intended exclusively to house a gaseous hydrogen system.

**ICE-SENSITIVE STRUCTURE.** A structure for which the effect of an atmospheric ice load governs the design of a structure or portion thereof. This includes, but is not limited to, lattice structures, guyed masts, overhead lines, light suspension and cable-stayed bridges, aerial cable systems (e.g., for ski lifts or logging operations), amusement rides, open catwalks and platforms, flagpoles and signs.

**IF, IF . . . THEN.** *[DSA-AC]* The terms "if" and "if . . . then" denote a specification that applies only when the conditions described are present.

**IGNITION-RESISTANT MATERIAL.** *[SFM]* (See Chapter 7A, Section 702A for defined term.)

**[F] IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).** The concentration of air-borne contaminants which poses a threat of death, immediate or delayed permanent adverse health effects, or effects that could prevent escape from such an environment. This contaminant concentration level is established by the National Institute of Occupational Safety and Health (NIOSH) based on both toxicity and flammability. It generally is expressed in parts per million by volume (ppmv/v) or milligrams per cubic meter (mg/m<sup>3</sup>). If adequate data do not exist for precise establishment of IDLH concentrations, an independent certified industrial hygienist, industrial toxicologist, appropriate regulatory agency or other source approved by the building official shall make such determination.

**IMPACT LOAD.** The load resulting from moving machinery, elevators, craneways, vehicles and other similar forces and kinetic loads, pressure and possible surcharge from fixed or moving loads.

**INCIDENTAL STRUCTURAL ALTERATIONS, ADDITIONS, OR REPAIRS.** *[OSHPD 1, 2 & 4]* Alterations, additions or repairs which would not reduce the story lateral shear force-resisting capacity by more than 5 percent or increase the story shear by more than 5 percent in any existing story.

**INCAPABLE OF SELF-PRESERVATION.** Persons because of age, physical limitations, mental limitations, chemical dependency, or medical treatment who cannot respond as an individual to an emergency situation.

**[F] INCOMPATIBLE MATERIALS.** Materials that, when mixed, have the potential to react in a manner that generates heat, fumes, gases or byproducts which are hazardous to life or property.

**[F] INERT GAS.** A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces. Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen and xenon.

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**INFANT.** Any child who because of age only, is unable to walk and requires the aid of another person to evacuate the building. In no case shall the term "infant" mean a child 2 years of age or older.

**[F] INITIATING DEVICE.** A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box or supervisory switch.

**INLET.** A fitting or fixture through which circulation water enters the pool.

**INSPECTION CERTIFICATE.** An identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency (see Section 1703.5 and "Label," "Manufacturer's designation" and "Mark").

**INTERIOR EXIT RAMP.** An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

**INTERIOR EXIT STAIRWAY.** An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

**INTERIOR FINISH.** Interior finish includes interior wall and ceiling finish and interior floor finish.

**INTERIOR FLOOR FINISH.** The exposed floor surfaces of buildings including coverings applied over a finished floor or stair, including risers.

**INTERIOR FLOOR-WALL BASE.** Interior floor finish trim used to provide a functional or decorative border at the intersection of walls and floors.

**INTERIOR SURFACES.** Surfaces other than weather exposed surfaces.

**INTERIOR WALL AND CEILING FINISH.** The exposed interior surfaces of buildings, including but not limited to: fixed or movable walls and partitions; toilet room privacy partitions; columns; ceilings; and interior wainscoting, paneling or other finish applied structurally or for decoration, acoustical correction, surface insulation, structural fire resistance or similar purposes, but not including trim.

**INTERLAYMENT.** A layer of felt or nonbituminous saturated felt not less than 18 inches (457 mm) wide, shingled between each course of a wood-shake roof covering.

**INTERNATIONAL SYMBOL OF ACCESSIBILITY.** The symbol adopted by Rehabilitation International's 11th World Congress for the purpose of indicating that buildings and facilities are accessible to persons with disabilities.

**INTUMESCENT FIRE-RESISTANT COATINGS.** Thin film liquid mixture applied to substrates by brush, roller, spray or trowel which expands into a protective foamed layer to provide fire-resistant protection of the substrates when exposed to flame or intense heat.

**JOINT.** The opening in or between adjacent assemblies that is created due to building tolerances, or is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

**[A] JURISDICTION.** The governmental unit that has adopted this code under due legislative authority.

**KEY STATION. [DSA-AC]** Certain rapid and light rail stations, and commuter rail stations, as defined under criteria established by the Department of Transportation in 49 CFR 37.47 and 49 CFR 37.51, respectively.

**KICK PLATE.** An abrasion-resistant plate affixed to the bottom portion of a door to prevent a trap condition and protect its surface.

**KITCHEN OR KITCHENETTE. [DSA-AC]** A room, space or area with equipment for the preparation and cooking of food.

**L RATING.** The air leakage rating of a through penetration firestop system or a fire-resistant joint system when tested in accordance with UL 1479 or UL 2079, respectively.

**[A] LABEL.** An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection certificate," "Manufacturer's designation" and "Mark").

**[A] LABELED.** Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose. **[HCD 1 & HCD 2]** "Labeled" means equipment or materials to which has been attached a label, symbol or other identifying mark of an organization, approved by the Department, that maintains a periodic inspection program of production of labeled products, installations, equipment, or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

**LABORATORY. [SFM]** A room, building or area where the use and storage of hazardous materials are utilized for testing, analysis, instruction, research or developmental activities.

**LABORATORY SUITE. [SFM]** A laboratory suite is a space within a building or structure, which may include multiple laboratories, offices, storage, equipment rooms or similar support functions, where the aggregate quantities of hazardous materials stored and used do not exceed the quantities set forth in Table 443.7.3.1.

**LADDER.** A series of vertically separate treads or rungs either connected by vertical rail members or independently fastened to an adjacent vertical pool wall.

**LAVATORY.** A fixed bowl or basin with running water and drainpipe, as in a toilet or bathing facility, for washing or bathing purposes. (As differentiated from the definition of "Sink".)

**LEVEL AREA.** [HCD 1-AC] A specified surface that does not have a slope in any direction exceeding  $\frac{1}{4}$  inch (6.4 mm) in 1 foot (305 mm) from the horizontal (2.083-percent gradient).

**LEVEL OF EXIT DISCHARGE.** See "Exit discharge, level of."

**LICENSING AGENCY.** [OSHPD 1] (See Chapter 12, Section 1224.3 for defined term.)

**LIFT, PLATFORM (WHEELCHAIR).** [HCD 1-AC] See "Platform (Wheelchair) Lift".

**LIGHT-DIFFUSING SYSTEM.** Construction consisting in whole or in part of lenses, panels, grids or baffles made with light-transmitting plastics positioned below independently mounted electrical light sources, skylights or light-transmitting plastic roof panels. Lenses, panels, grids and baffles that are part of an electrical fixture shall not be considered as a light-diffusing system.

**LIGHT-FRAME CONSTRUCTION.** A type of construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or cold-formed steel framing members.

**LIGHT-TRANSMITTING PLASTIC ROOF PANELS.** Structural plastic panels other than skylights that are fastened to structural members, or panels or sheathing and that are used as light-transmitting media in the plane of the roof.

**LIGHT-TRANSMITTING PLASTIC WALL PANELS.** Plastic materials that are fastened to structural members, or to structural panels or sheathing, and that are used as light-transmitting media in exterior walls.

**LIMIT STATE.** A condition beyond which a structure or member becomes unfit for service and is judged to be no longer useful for its intended function (serviceability limit state) or to be unsafe (strength limit state).

**[F] LIQUID.** A material that has a melting point that is equal to or less than 68°F (20°C) and a boiling point that is greater than 68°F (20°C) at 14.7 pounds per square inch absolute (psia) (101 kPa). When not otherwise identified, the term "liquid" includes both flammable and combustible liquids.

**[F] LIQUID STORAGE ROOM.** A room classified as a Group H-3 occupancy used for the storage of flammable or combustible liquids in a closed condition.

**[F] LIQUID USE, DISPENSING AND MIXING ROOM.** A room in which Class I, II and IIIA flammable or combustible liquids are used, dispensed or mixed in open containers.

**[A] LISTED.** Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

**[HCD 1 & HCD 2]** "Listed" means all products that appear in a list published by an approved testing or listing agency. For additional information, see Health and Safety Code Section 17920(h).

For applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, "listed" shall also mean equipment or materials accepted by the state fire marshal as conforming to the provisions of the State Fire Marshal's regulations and which are included in a list published by the State Fire Marshal.

**LISTING AGENCY.** [HCD 1 & HCD 2] An agency approved by the department that is in the business of listing and labeling products, materials, equipment and installations tested by an approved testing agency, and that maintains a periodic inspection program on current production of listed products, equipment and installations, and that, at least annually, makes available a published report of these listings. For additional information, see Health and Safety Code Section 17920(i).

**LIQUID TIGHT FLOOR.** [SFM] A nonpermeable barrier capable of containing hazardous material liquids without degradation.

**LIVE/WORK UNIT.** A dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant.

**LIVE LOAD.** A load produced by the use and occupancy of the building or other structure that does not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load or dead load.

**LIVE LOAD, ROOF.** A load on a roof produced:

1. During maintenance by workers, equipment and materials;
2. During the life of the structure by movable objects such as planters or other similar small decorative appurtenances that are not occupancy related; or
3. By the use and occupancy of the roof such as for roof gardens or assembly areas.

**LOAD AND RESISTANCE FACTOR DESIGN (LRFD).** A method of proportioning structural members and their connections using load and resistance factors such that no applicable limit state is reached when the structure is subjected to appropriate load combinations. The term "LRFD" is used in the design of steel and wood structures.

**LOAD EFFECTS.** Forces and deformations produced in structural members by the applied loads.

**LOAD FACTOR.** A factor that accounts for deviations of the actual load from the nominal load, for uncertainties in the analysis that transforms the load into a load effect, and for the probability that more than one extreme load will occur simultaneously.

**LOADS.** Forces or other actions that result from the weight of building materials, occupants and their possessions, environmental effects, differential movement and restrained dimensional changes. Permanent loads are those loads in which variations over time are rare or of small magnitude,

## DEFINITIONS

such as dead loads. All other loads are variable loads (see also “Nominal loads”).

**LOBBY.** [SFM, HCD 1 & HCD 2] An area not defined as a waiting room at the entrance of a building through which persons must pass.

**LOCAL AGENCY VERY HIGH FIRE HAZARD SEVERITY ZONE.** [SFM] (See Chapter 7A, Section 702A for defined term.)

**LODGING HOUSE.** [HCD 1] Any building or portion thereof containing not more than five guest rooms where rent is paid in money, goods, labor or otherwise.

**LOG WALL CONSTRUCTION.** [SFM] (See Chapter 7A, Section 702A for defined term.)

**[A] LOT.** A portion or parcel of land considered as a unit.

**[A] LOT LINE.** A line dividing one lot from another, or from a street or any public place.

**[F] LOWER FLAMMABLE LIMIT (LFL).** The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL is sometimes referred to as “LEL” or “lower explosive limit.”

**LOWEST FLOOR.** The floor of the lowest enclosed area, including basement, but excluding any unfinished or flood-resistant enclosure, usable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the structure in violation of Section 1612.

**MAIL BOXES.** [DSA-AC] Receptacles for the receipt of documents, packages or other deliverable matter. Mail boxes include, but are not limited to, post office boxes and receptacles provided by commercial mail-receiving agencies, apartment facilities or schools.

**MAIN WINDFORCE-RESISTING SYSTEM.** An assemblage of structural elements assigned to provide support and stability for the overall structure. The system generally receives wind loading from more than one surface

**MAJOR STRUCTURAL ALTERATIONS, ADDITIONS, OR REPAIRS.** [OSHPD 1, 2 & 4] Alterations, additions or repairs of greater extent than minor structural alterations, additions, or repairs.

**MALL BUILDING, COVERED and MALL BUILDING, OPEN.** See “Covered mall building.”

**[F] MANUAL FIRE ALARM BOX.** A manually operated device used to initiate an alarm signal.

**[A] MANUFACTURER'S DESIGNATION.** An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also “Inspection certificate,” “Label” and “Mark”).

**[A] MARK.** An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also “Inspection certificate,” “Label” and “Manufacturer’s designation”).

**MARKED CROSSING.** A crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

**MARQUEE.** A canopy that has a top surface which is sloped less than 25 degrees from the horizontal and is located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the marquee.

**MASONRY.** A built-up construction or combination of building units or materials of clay, shale, concrete, glass, gypsum, stone or other approved units bonded together with or without mortar or grout or other accepted methods of joining.

**Ashlar masonry.** Masonry composed of various-sized rectangular units having sawed, dressed or squared bed surfaces, properly bonded and laid in mortar.

**Coursed ashlar.** Ashlar masonry laid in courses of stone of equal height for each course, although different courses shall be permitted to be of varying height.

**Glass unit masonry.** Masonry composed of glass units bonded by mortar.

**Plain masonry.** Masonry in which the tensile resistance of the masonry is taken into consideration and the effects of stresses in reinforcement are neglected.

**Random ashlar.** Ashlar masonry laid in courses of stone set without continuous joints and laid up without drawn patterns. When composed of material cut into modular heights, discontinuous but aligned horizontal joints are discernible.

**Reinforced masonry.** Masonry construction in which reinforcement acting in conjunction with the masonry is used to resist forces.

**Solid masonry.** Masonry consisting of solid masonry units laid contiguously with the joints between the units filled with mortar.

**Unreinforced (plain) masonry.** Masonry in which the tensile resistance of masonry is taken into consideration and the resistance of the reinforcing steel, if present, is neglected.

**MASONRY UNIT.** Brick, tile, stone, glass block or concrete block conforming to the requirements specified in Section 2103.

**Hollow.** A masonry unit whose net cross-sectional area in any plane parallel to the load-bearing surface is less than 75 percent of its gross cross-sectional area measured in the same plane.

**Solid.** A masonry unit whose net cross-sectional area in every plane parallel to the load-bearing surface is 75 percent or more of its gross cross-sectional area measured in the same plane.

**MASTIC FIRE-RESISTANT COATINGS.** Liquid mixture applied to a substrate by brush, roller, spray or trowel that provides fire-resistant protection of a substrate when exposed to flame or intense heat.

**MAY.** [DSA-AC] May denotes an option or alternative.

**MEANS OF EGRESS.** A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

**MECHANICAL-ACCESS OPEN PARKING GARAGES.** Open parking garages employing parking machines, lifts, elevators or other mechanical devices for vehicles moving from and to street level and in which public occupancy is prohibited above the street level.

**MECHANICAL EQUIPMENT SCREEN.** A rooftop structure, not covered by a roof, used to aesthetically conceal plumbing, electrical or mechanical equipment from view.

**MECHANICAL SYSTEMS.** For the purposes of determining seismic loads in ASCE 7, mechanical systems shall include plumbing systems as specified therein.

**MEDICAL CARE.** Care involving medical or surgical procedures, nursing or for psychiatric purposes.

**MEDICAL POOL.** *A special-purpose pool used by a state-recognized medical institution engaged in the healing arts under the direct supervision of licensed medical personnel for treatment of the infirm.*

**MEMBRANE-COVERED CABLE STRUCTURE.** A nonpressurized structure in which a mast and cable system provides support and tension to the membrane weather barrier and the membrane imparts stability to the structure.

**MEMBRANE-COVERED FRAME STRUCTURE.** A nonpressurized building wherein the structure is composed of a rigid framework to support a tensioned membrane which provides the weather barrier.

**MEMBRANE PENETRATION.** A breach in one side of a floor-ceiling, roof-ceiling or wall assembly to accommodate an item installed into or passing through the breach.

**MEMBRANE-PENETRATION FIRESTOP.** A material, device or construction installed to resist for a prescribed time period the passage of flame and heat through openings in a protective membrane in order to accommodate cables, cable trays, conduit, tubing, pipes or similar items.

**MEMBRANE-PENETRATION FIRESTOP SYSTEM.** An assemblage consisting of a fire-resistance-rated floor-ceiling, roof-ceiling or wall assembly, one or more penetrating items installed into or passing through the breach in one side of the assembly and the materials or devices, or both, installed to resist the spread of fire into the assembly for a prescribed period of time.

**MENTALLY RETARDED PERSONS, PROFOUNDLY OR SEVERELY.** Shall mean any retarded person who is unable to evacuate a building unassisted during emergency conditions.

*Note: The determination as to such incapacity shall be made by the Director of the State Department of Public Health or his or her designated representative pursuant to Health and Safety Code Section 13131.3.*

**MERCHANDISE PAD.** A merchandise pad is an area for display of merchandise surrounded by aisles, permanent fixtures or walls. Merchandise pads contain elements such as nonfixed and moveable fixtures, cases, racks, counters and partitions as indicated in Section 105.2 from which customers browse or shop.

**METAL COMPOSITE MATERIAL (MCM).** A factory-manufactured panel consisting of metal skins bonded to both faces of a plastic core.

**METAL COMPOSITE MATERIAL (MCM) SYSTEM.** An exterior wall covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

**METAL ROOF PANEL.** An interlocking metal sheet having a minimum installed weather exposure of 3 square feet (0.279 m<sup>2</sup>) per sheet.

**METAL ROOF SHINGLE.** An interlocking metal sheet having an installed weather exposure less than 3 square feet (0.279 m<sup>2</sup>) per sheet.

**MEZZANINE.** An intermediate level or levels between the floor and ceiling of any story and in accordance with Section 505. *[DSA-AC] An intermediate level or levels between the floor and ceiling of any story with an aggregate floor area of not more than one-third of the area of the room or space in which the level or levels are located. Mezzanines have sufficient elevation that space for human occupancy can be provided on the floor below.*

**MICROPILE.** A micropile is a bored, grouted-in-place deep foundation element that develops its load-carrying capacity by means of a bond zone in soil, bedrock or a combination of soil and bedrock.

**MINERAL BOARD.** A rigid felted thermal insulation board consisting of either felted mineral fiber or cellular beads of expanded aggregate formed into flat rectangular units.

**MINERAL FIBER.** Insulation composed principally of fibers manufactured from rock, slag or glass, with or without binders.

**MINERAL WOOL.** Synthetic vitreous fiber insulation made by melting predominately igneous rock or furnace slag, and other inorganic materials, and then physically forming the melt into fibers.

**MINOR STRUCTURAL ALTERATIONS, ADDITIONS, OR REPAIRS. [OSHPD 1, 2 & 4]** Alterations, additions or repairs of greater extent than incidental structural additions or alterations which would not reduce the story shear lateral-force-resisting capacity by more than 10 percent or increase base shear by more than 10 percent.

**MODIFIED BITUMEN ROOF COVERING.** One or more layers of polymer-modified asphalt sheets. The sheet materials shall be fully adhered or mechanically attached to the substrate or held in place with an approved ballast layer.

**MONOLITHIC. [OSHPD 1]** (See Chapter 12, Section 1224.3 for defined term.)

**MONOLITHIC CEILING. [OSHPD 1]** (See Chapter 12, Section 1224.3 for defined term.)

**MORTAR.** A mixture consisting of cementitious materials, fine aggregates, water, with or without admixtures, that is used to construct unit masonry assemblies.

**MORTAR, SURFACE-BONDING.** A mixture to bond concrete masonry units that contains hydraulic cement, glass fiber reinforcement with or without inorganic fillers or organic modifiers and water.

**MOTEL. [HCD 1 & HCD 2]** See "Hotel" or "Motel."

## DEFINITIONS

**MOTION PICTURE AND TELEVISION PRODUCTION STUDIO SOUND STAGES, APPROVED PRODUCTION FACILITIES AND PRODUCTION LOCATIONS.** See Chapter 46, California Fire Code.

**MULTI-BEDROOM HOUSING UNIT.** [DSA-AC] A housing unit, intended for use by students at a place of education, with a kitchen and/or toilet and bathing rooms within the unit, such as an apartment or dormitory. Multi-bedroom housing units are separate from one another and from common use spaces within a building.

**[F] MULTIPLE-STATION ALARM DEVICE.** Two or more single-station alarm devices that can be interconnected such that actuation of one causes all integral or separate audible alarms to operate. It also can consist of one single-station alarm device having connections to other detectors or to a manual fire alarm box.

**[F] MULTIPLE-STATION SMOKE ALARM.** Two or more single-station alarm devices that are capable of interconnection such that actuation of one causes the appropriate alarm signal to operate in all interconnected alarms.

**MULTISTORY DWELLING UNIT.** [HCD 1-AC] A dwelling unit with finished living space located on one floor and the floor or floors immediately above or below it.

**NAILING, BOUNDARY.** A special nailing pattern required by design at the boundaries of diaphragms.

**NAILING, EDGE.** A special nailing pattern required by design at the edges of each panel within the assembly of a diaphragm or shear wall.

**NAILING, FIELD.** Nailing required between the sheathing panels and framing members at locations other than boundary nailing and edge nailing.

**NATURALLY DURABLE WOOD.** The heartwood of the following species except for the occasional piece with corner sapwood, provided 90 percent or more of the width of each side on which it occurs is heartwood.

**Decay resistant.** Redwood, cedar, black locust and black walnut.

**Termite resistant.** Redwood, Alaska yellow cedar, Eastern red cedar and both heartwood and all sapwood of Western red cedar.

**NEWLY CONSTRUCTED.** [HCD 1-AC] A building that has never before been used or occupied for any purpose.

**NEXT GENERATION ATTENUATION (NGA).** [DSA-SS, DSA-SS/CC & OSHPD 1 & 4] Attenuation relations used for the 2008 United States Geological Survey (USGS) seismic hazards maps (for the Western United States) or their equivalent as determined by the enforcement agency.

**NFPA [DSA-AC]** The National Fire Protection Association.

**NOMINAL LOADS.** The magnitudes of the loads specified in Chapter 16 (dead, live, soil, wind, snow, rain, flood and earthquake).

**NOMINAL SIZE (LUMBER).** The commercial size designation of width and depth, in standard sawn lumber and glued-laminated lumber grades; somewhat larger than the standard net size of dressed lumber, in accordance with DOCPS 20 for sawn lumber and with the AF&PA NDS for glued-laminated lumber.

**NON-GENERAL ACUTE CARE BUILDING (Non-GAC Building).** [OSHPD 1] A non-freestanding SPC building, which is removed from general acute care services in accordance with the Section 3418A that remains under OSHPD jurisdiction as part of an OSHPD 1 Hospital building.

**NONAMBULATORY PERSONS.** Persons unable to leave a building unassisted under emergency conditions. It includes, but is not limited to, persons who depend on mechanical aids such as crutches, walkers and wheelchairs and any person who is unable to physically and mentally respond to a sensory signal approved by the state fire marshal or an oral instruction relating to fire danger.

The determination of ambulatory or nonambulatory status of persons with developmental disabilities shall be made by the Director of Social Services or his or her designated representative, in consultation with the director of Developmental Services or his or her designated representative. The determination of ambulatory or nonambulatory status of all other disabled persons placed after January 1, 1984, who are not developmentally disabled shall be made by the Director of Social Services or his or her designated representative.

**NONCOMBUSTIBLE.** [SFM] Noncombustible as applied to building construction material means a material which, in the form in which it is used, is either one of the following:

1. Material of which no part will ignite and burn when subjected to fire. Any material passing ASTM E 136 shall be considered noncombustible.
2. Material having a structural base of noncombustible material as defined in Item 1 above, with a surfacing material not over 1/8 inch (3.2 mm) thick which has a flame-spread index of 50 or less.

"Noncombustible" does not apply to surface finish materials. Material required to be noncombustible for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to Item 1. No material shall be classed as noncombustible which is subject to increase in combustibility or flame-spread index, beyond the limits herein established, through the effects of age, moisture or other atmospheric condition.

**NONCOMBUSTIBLE MEMBRANE STRUCTURE.** A membrane structure in which the membrane and all component parts of the structure are noncombustible.

**NORMAL.** [HCD 1 & HCD 2] Conforming to a pattern or standard regarded as usual or typical.

**[F] NORMAL TEMPERATURE AND PRESSURE (NTP).** A temperature of 70°F (21°C) and a pressure of 1 atmosphere [14.7 psia (101 kPa)].

**NOSING.** The leading edge of treads of stairs and of landings at the top of stairway flights.

**[F] NOTIFICATION ZONE.** See "Zone, notification."

**NPC 1, NPC 2, NPC 3/NPC 3R, NPC 4, and NPC 5** are the building nonstructural performance categories for Hospital Buildings defined in Table 11.1 of California Administrative Code (Part 1, Title 24 CCR), Chapter 6.

**[F] NUISANCE ALARM.** An alarm caused by mechanical failure, malfunction, improper installation or lack of proper maintenance, or an alarm activated by a cause that cannot be determined.

**NURSING HOMES.** Facilities that provide care, including both intermediate care facilities and skilled nursing facilities where any of the persons are incapable of self-preservation or classified as nonambulatory or bedridden..

**OCCUPANT LOAD.** The number of persons for which the means of egress of a building or portion thereof is designed.

**OCCUPIABLE SPACE.** A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

**OPEN PARKING GARAGE.** A structure or portion of a structure with the openings as described in Section 406.5.2 on two or more sides that is used for the parking or storage of private motor vehicles as described in Section 406.5.3.

**OPEN RISER.** The space between two adjacent stair treads not closed by a riser.

**OPEN STATION. [SFM]** (See Chapter 4, Section 433 for definition of term.)

**[F] OPEN SYSTEM.** The use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, dip tank and plating tank operations.

**OPERATIONS CONTROL CENTER (OCC) (CENTRAL CONTROL). [SFM]** (See Chapter 4, Section 433 for definition of term)

**OPERABLE PART.** A component of an element used to insert or withdraw objects, or to activate, deactivate, or adjust the element.

**[F] OPERATING BUILDING.** A building occupied in conjunction with the manufacture, transportation or use of explosive materials. Operating buildings are separated from one another with the use of intraplant or intraline distances

**ORDINARY PRECAST STRUCTURAL WALL.** See Section 1905.1.1.

**ORDINARY REINFORCED CONCRETE STRUCTURAL WALL.** See Section 1905.1.1.

**ORDINARY STRUCTURAL PLAIN CONCRETE WALL.** See Section 1905.1.1.

**[F] ORGANIC PEROXIDE.** An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can pose an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.

**Class I.** Those formulations that are capable of deflagration but not detonation.

**Class II.** Those formulations that burn very rapidly and that pose a moderate reactivity hazard.

**Class III.** Those formulations that burn rapidly and that pose a moderate reactivity hazard.

**Class IV.** Those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.

**Class V.** Those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.

**Unclassified detonable.** Organic peroxides that are capable of detonation. These peroxides pose an extremely high explosion hazard through rapid explosive decomposition.

**ORGANIZED CAMPS.** See Section 440.

**ORTHOGONAL.** To be in two horizontal directions, at 90 degrees (1.57 rad) to each other.

**OTHER STRUCTURES.** Structures, other than buildings, for which loads are specified in Chapter 16.

**OUTPATIENT CLINIC.** See "Clinic, outpatient."

**[A] OWNER.** Any person, agent, firm or corporation having a legal or equitable interest in the property.

**OVERFLOW SYSTEM.** The system which includes perimeter-type overflow gutters, surface skimmers, surge or collector tanks, other surface water collective system components and their interconnecting piping.

**[F] OXIDIZER.** A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.

**Class 4.** An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.

**Class 3.** An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes into contact.

**Class 2.** An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes into contact.

**Class 1.** An oxidizer that does not moderately increase the burning rate of combustible materials.

**[F] OXIDIZING GAS.** A gas that can support and accelerate combustion of other materials more than air does.

**PANEL (PART OF A STRUCTURE).** The section of a floor, wall or roof comprised between the supporting frame of two adjacent rows of columns and girders or column bands of floor or roof construction.

**PANIC HARDWARE.** A door-latching assembly incorporating a device that releases the latch upon the application of a force in the direction of egress travel. See also "Fire exit hardware."

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**PARTICLEBOARD.** A generic term for a panel primarily composed of cellulosic materials (usually wood), generally in the form of discrete pieces or particles, as distinguished from fibers. The cellulosic material is combined with synthetic resin or other suitable bonding system by a process in which the interparticle bond is created by the bonding system under heat and pressure.

**PASSAGE DOOR.** [HCD 1-AC] A door other than an exit door through which persons may traverse.

**PASSENGER ELEVATOR.** [DSA-AC] See "Elevator, Passenger"

[HCD 1 & HCD 2] "Passenger Elevator" is an elevator used primarily to carry persons. For additional information, see California Code of Regulations, Title 8, Division 1, Chapter 4.

**PASSIVE SOLAR ENERGY COLLECTOR.** [HCD 1 & HCD 2] Uses architectural components, rather than mechanical components, to provide heating or cooling for a building interior.

**PATH OF TRAVEL.** [DSA-AC] An identifiable accessible route within an existing site, building or facility by means of which a particular area may be approached, entered and exited, and which connects a particular area with an exterior approach (including sidewalks, streets and parking areas), an entrance to the facility, and other parts of the facility. When alterations, structural repairs or additions are made to existing buildings or facilities, the term "path of travel" also includes the toilet and bathing facilities, telephones, drinking fountains and signs serving the area of work.

**PEDESTRIAN.** An individual who moves in walking areas with or without the use of walking assistive devices such as crutches, leg braces, wheelchairs, white cane, service animal, etc.

**PEDESTRIAN WAY.** A route by which a pedestrian may pass.

**PENETRATION FIRESTOP.** A through-penetration firestop or a membrane-penetration firestop.

**PENTHOUSE.** An enclosed, unoccupied rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, and vertical shaft openings.

**PERFORMANCE CATEGORY.** A designation of wood structural panels as related to the panel performance used in Chapter 23.

**PERMANENT** [DSA-AC] Facilities which, are intended to be used for periods longer than those designated in this code under the definition of "Temporary."

**PERMANENT PORTABLE BUILDING.** [SFM] A portable building that is used to serve or house students and is certified as a permanent building on a new public school campus by the public school administration shall comply with the requirements of new campus buildings.

**[A] PERMIT.** An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

**[A] PERSON.** An individual, heirs, executors, administrators or assigns, and also includes a firm, partnership or corporation, its or their successors or assigns, or the agent of any of the aforesaid.

**PERSONS WITH DISABILITIES.** [HCD 1-AC] For purposes of Chapter 11A, "Persons with disabilities" includes, but is not limited to, any physical or mental disability as defined in Government Code Section 12926.

**PHOTOLUMINESCENT.** Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

**PHOTOVOLTAIC MODULES/SHINGLES.** A roof covering composed of flat-plate photovoltaic modules fabricated in sheets that resemble three-tab composite shingles.

**[F] PHYSICAL HAZARD.** A chemical for which there is evidence that it is a combustible liquid, cryogenic fluid, explosive, flammable (solid, liquid or gas), organic peroxide (solid or liquid), oxidizer (solid or liquid), oxidizing gas, pyrophoric (solid, liquid or gas), unstable (reactive) material (solid, liquid or gas) or water-reactive material (solid or liquid).

**[F] PHYSIOLOGICAL WARNING THRESHOLD LEVEL.** A concentration of air-borne contaminants, normally expressed in parts per million (ppm) or milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ), that represents the concentration at which persons can sense the presence of the contaminant due to odor, irritation or other quick-acting physiological response. When used in conjunction with the permissible exposure limit (PEL) the physiological warning threshold levels are those consistent with the classification system used to establish the PEL. See the definition of "Permissible exposure limit (PEL)" in the *California Fire Code*.

**PICTOGRAM.** A pictorial symbol that represents activities, facilities, or concepts.

**PLACE OF PUBLIC ACCOMMODATION.** A facility operated by a private entity whose operations affect commerce and fall within at least one of the following categories:

- (1) Place of lodging, except for an establishment located within a facility that contains not more than five rooms for rent or hire and that actually is occupied by the proprietor of the establishment as the residence of the proprietor. For purposes of this code, a facility is a "place of lodging" if it is
  - (i) An inn, hotel or motel; or
  - (ii) A facility that
    - (A) Provides guest rooms for sleeping for stays that primarily are short-term in nature (generally 30 days or less) where the occupant does not have the right to return to a specific room or unit after the conclusion of his or her stay; and
    - (B) Provides guest rooms under conditions and with amenities similar to a hotel, motel, or inn, including the following:
      - (1) On- or off-site management and reservations service;

- (2) *Rooms available on a walk-up or call-in basis;*
- (3) *Availability of housekeeping or linen service; and*
- (4) *Acceptance of reservations for a guest room type without guaranteeing a particular unit or room until check-in, and without a prior lease or security deposit.*
- (2) *A restaurant, bar, or other establishment serving food or drink;*
- (3) *A motion picture house, theater, concert hall, stadium, or other place of exhibition or entertainment;*
- (4) *An auditorium, convention center, lecture hall, or other place of public gathering;*
- (5) *A bakery, grocery store, clothing store, hardware store, shopping center, or other sales or rental establishment;*
- (6) *A laundromat, dry-cleaner, bank, barber shop, beauty shop, travel service, shoe repair service, funeral parlor, gas station, office of an accountant or lawyer, pharmacy, insurance office, professional office of a health care provider, hospital, or other service establishment;*
- (7) *A terminal, depot, or other station used for specified public transportation;*
- (8) *A museum, library, gallery, or other place of public display or collection;*
- (9) *A park, zoo, amusement park, or other place of recreation;*
- (10) *A nursery, elementary, secondary, undergraduate, or postgraduate private school, or other place of education;*
- (11) *A day-care center, senior citizen center, homeless shelter, food bank, adoption agency, or other social service center establishment;*
- (12) *A gymnasium, health spa, bowling alley, golf course, or other place of exercise or recreation;*
- (13) *A religious facility;*
- (14) *An office building; and*
- (15) *A public curb or sidewalk.*

**PLACE OF RELIGIOUS WORSHIP.** See "Religious worship, place of."

**PLASTIC, APPROVED.** Any thermoplastic, thermosetting or reinforced thermosetting plastic material that conforms to combustibility classifications specified in the section applicable to the application and plastic type.

**PLASTIC GLAZING.** Plastic materials that are glazed or set in frame or sash and not held by mechanical fasteners that pass through the glazing material.

**PLATFORM.** A raised area within a building used for worship, the presentation of music, plays or other entertainment; the head table for special guests; the raised area for lecturers

and speakers; boxing and wrestling rings; theater-in-the-round stages; and similar purposes wherein there are no overhead hanging curtains, drops, scenery or stage effects other than lighting and sound. A temporary platform is one installed for not more than 30 days.

**PLATFORM (WHEELCHAIR) LIFT.** A hoisting and lowering mechanism equipped with a car or platform or support that serves two landings of a building or structure and is designed to carry a passenger or passengers and/or luggage or other material a vertical distance as may be allowed.

**PLAY AREA.** [DSA-AC] A portion of a site containing play components designed and constructed for children.

**PLAY COMPONENT.** [DSA-AC] An element intended to generate specific opportunities for play, socialization or learning. Play components are manufactured or natural; and are stand-alone or part of a composite play structure.

**POINT OF SAFETY.** [SFM] (See Chapter 4, Section 433 for definition of term.)

**POINT-OF-SALE DEVICE.** [DSA-AC] A device used for the purchase of a good or service where a personal identification number (PIN), zip code or signature is required.

**POLYPROPYLENE SIDING.** A shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases contains fillers or reinforcements, that is used to clad exterior walls of buildings.

**POOL.** A constructed or prefabricated artificial basin, chamber or tank intended to be used primarily by bathers, and not for cleaning of the body or for individual therapeutic use.

**POOL USER.** A person using a pool and ancillary facilities for the purpose of water activities such as diving, swimming or wading.

**POOL VOLUME.** The amount of water expressed in gallons (liters) that a pool holds when filled.

**PORCELAIN TILE.** Porcelain tile shall conform to the requirements of ANSI 137.1.3 for ceramic tile having an absorption of 0.5 percent or less according to ANSI 137.4.1-Class Table and ANSI 137.1.6.1 Allowable Properties by Tile Type-Table 10.

**POSITIVE ROOF DRAINAGE.** The drainage condition in which consideration has been made for all loading deflections of the roof deck, and additional slope has been provided to ensure drainage of the roof within 48 hours of precipitation.

**POWDER ROOM.** A room containing a water closet (toilet) and a lavatory, and which is not defined as a bathroom.

**POWER-ASSISTED DOOR** [DSA-AC] A door used for human passage with a mechanism that helps to open the door, or relieves the opening resistance of a door, upon the activation of a switch or a continued force applied to the door itself.

**POWER SUBSTATION.** [SFM] (See Chapter 4, Section 433 for definition of term.)

**PREFABRICATED WOOD I-JOIST.** Structural member manufactured using sawn or structural composite lumber flanges and wood structural panel webs bonded together with

## DEFINITIONS

exterior exposure adhesives, which forms an "I" cross-sectional shape.

**PRESTRESSED MASONRY.** Masonry in which internal stresses have been introduced to counteract potential tensile stresses in masonry resulting from applied loads.

**PRIMARY ENTRY.** [HCD 1-AC] *The principal entrance through which most people enter the building, as designated by the building official.*

**PRIMARY ENTRY LEVEL.** [HCD 1-AC] *The floor or level of the building on which the primary entry is located.*

**PRIMARY FUNCTION.** A primary function is a major activity for which the facility is intended. Areas that contain a primary function include, but are not limited to, the customer service lobby of a bank, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public accommodation or other private entity using the facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors and restrooms are not areas containing a primary function.

**PRIMARY STRUCTURAL FRAME.** The primary structural frame shall include all of the following structural members:

1. The columns;
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels;
3. Members of the floor construction and roof construction having direct connections to the columns; and
4. Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity loads.

**PRISM.** An assemblage of masonry units and mortar with or without grout used as a test specimen for determining properties of the masonry.

**PRIVATE BUILDING OR FACILITY.** [DSA-AC] *A place of public accommodation or a commercial building or facility subject to Chapter 1, Section 1.9.1.2.*

**PRIVATE POOL.** Any constructed pool, permanent or portable, that is intended for noncommercial use as a swimming pool by not more than three owner families and their guests.

**Note:** A single-family residence is a Group R, Division 3 occupancy.

**PROFESSIONAL OFFICE OF A HEALTH CARE PROVIDER.** [DSA-AC] *See Chapter 11B. A location where a person or entity, regulated by the State to provide professional services related to the physical or mental health of an individual, makes such services available to the public. The facility housing the professional office of a health care provider only includes floor levels housing at least one health*

*care provider, or any floor level designed or intended for use by at least one health care provider.*

**PROSCENIUM WALL.** The wall that separates the stage from the auditorium or assembly seating area.

**PROTECTIVE SOCIAL CARE FACILITY.** [SFM] *A facility housing persons, who are referred, placed or caused to be placed in the facility, by any governmental agency and for whom the services, or a portion thereof, are paid for by any governmental agency. These occupancies shall include, but are not limited to, those commonly referred to as "assisted living facilities," "social rehabilitation facilities," "certified family care homes," "out-of-home placement facilities," and "halfway houses."*

**PSYCHIATRIC HOSPITALS.** See "Hospitals."

**PUBLIC BUILDING OR FACILITY.** [DSA-AC] *A building or facility or portion of a building or facility designed, constructed, or altered by, on behalf of, or for the use of a public entity subject to Chapter 1, Section 1.9.1.1.*

**PUBLIC ENTITY.** Any state or local government; any department, agency, special-purpose district, or other instrumentality of a state or local government.

**PUBLIC ENTRANCE.** An entrance that is not a service entrance or a restricted entrance.

**PUBLIC HOUSING.** [DSA-AC] *Housing facilities owned, operated, or constructed by, for or on behalf of a public entity including but not limited to the following:*

1. *Publicly owned and/or operated one- or two-family dwelling units or congregate residences;*
2. *Publicly owned and/or operated buildings or complexes with three or more residential dwelling units;*
3. *Reserved.*
4. *Publicly owned and/or operated homeless shelters, group homes and similar social service establishments;*
5. *Publicly owned and/or operated transient lodging, such as hotels, motels, hostels and other facilities providing accommodations of a short term nature of not more than 30 days duration;*
6. *Housing at a place of education owned or operated by a public entity, such as housing on or serving a public school, public college or public university campus;*
7. *Privately owned housing made available for public use as housing.*

**PUBLIC POOL.** A pool other than a private pool.

**PUBLIC USE.** [DSA-AC] *Interior or exterior rooms, spaces or elements that are made available to the public. Public use may be provided at a building or facility that is privately or publicly owned. Private interior or exterior rooms, spaces or elements associated with a residential dwelling unit provided by a public housing program or in a public housing facility are not public use areas and shall not be required to be made available to the public. In the context of public housing,*

*public use is the provision of housing programs by, for or on behalf of a public entity.*

**PUBLIC-USE AREAS.** *Interior or exterior rooms or spaces of a building that are made available to the general public and do not include common use areas. Public use areas may be provided at a building that is privately or publicly owned.*

**[A] PUBLIC WAY.** A street, alley or other parcel of land open to the outside air leading to a street, that has been deeded, dedicated or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than 10 feet (3048 mm).

**[F] PYROPHORIC.** A chemical with an auto-ignition temperature in air, at or below a temperature of 130°F (54.4°C).

**[F] PYROTECHNIC COMPOSITION.** A chemical mixture that produces visible light displays or sounds through a self-propagating, heat-releasing chemical reaction which is initiated by ignition.

**QUALIFIED HISTORIC BUILDING OR FACILITY.** *[DSA-AC] A building or facility that is listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate State or local law. See C.C.R. Title 24, Part 8.*

**RAFTERTAIL. [SFM]** *(See Chapter 7A, Section 702A for defined term.)*

**RAMP.** A walking surface that has a running slope steeper than one unit vertical in 20 units horizontal (5-percent slope).

**RAMP-ACCESS OPEN PARKING GARAGES.** Open parking garages employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of vehicles under their own power from and to the street level.

**REASONABLE PORTION [DSA-AC]** *That segment of a building, facility, area, space or condition, which would normally be necessary if the activity therein is to be accessible by persons with disabilities.*

**RECESSED STEPS.** *A riser/tread or series of risers/treads extending down into the deck with the bottom riser or tread terminating at the pool wall (thus creating a "stairwell").*

**RECESSED TREADS.** *A series of vertically spaced cavities in the pool wall creating tread areas for step holes.*

**RECIRCULATION SYSTEM.** *The interconnected system traversed by the recirculated water from the pool until it is returned to the pool, i.e., from the pool through the collector or surge tank, recirculation pump, filters, chemical treatment and heater (if provided), and returned to the pool.*

**RECOMMEND. [DSA-AC, HCD 1 & HCD 2]** *Does not require mandatory acceptance, but identifies a suggested action that shall be considered for the purpose of providing a greater degree of accessibility to persons with disabilities.*

**[F] RECORD DRAWINGS.** Drawings ("as built") that document the location of all devices, appliances, wiring sequences, wiring methods and connections of the components of a fire alarm system as installed.

**REFLECTIVE PLASTIC CORE FOIL INSULATION.** An insulation material packaged in rolls, that is less than 0.5

inches thick, with at least one exterior low emittance surface (0.1 or less) and a core material containing voids or cells.

**[A] REGISTERED DESIGN PROFESSIONAL.** An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

**[A] REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.** A registered design professional engaged by the owner to review and coordinate certain aspects of the project, as determined by the building official, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

**RELIGIOUS WORSHIP, PLACE OF.** A building or portion thereof intended for the performance of religious services.

**RELOCATABLE BUILDING (PUBLIC SCHOOL).** Any building with an integral floor structure which is capable of being readily moved. *(See Education Code Section 17350.) Relocatable buildings that are to be placed on substandard foundations not complying with the requirements of Part 2, Title 24, C.C.R., require a statement from the school district stating that the durability requirements for those foundations may be waived and acknowledging the temporary nature of the foundations.*

**REMODELING. [DSA-AC]** *See "Alteration."*

**[A] REPAIR.** The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

**REROOFING.** The process of recovering or replacing an existing roof covering. *See "Roof recover" and "Roof replacement."*

**RESIDENTIAL AIRCRAFT HANGAR.** An accessory building less than 2,000 square feet (186 m<sup>2</sup>) and 20 feet (6096 mm) in building height constructed on a one- or two-family property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.

**RESIDENTIAL CARE FACILITY FOR THE CHRONICALLY ILL (RCF/CI).** As termed, means a housing arrangement with a maximum capacity of 25 residents that provides a range of services to residents who have chronic, life-threatening illnesses.

**RESIDENTIAL CARE FACILITY FOR THE ELDERLY (RCFE).** As defined in Health and Safety Code Section 1569.2, shall mean a facility with a housing arrangement chosen voluntarily by persons 60 years of age or over, or their authorized representative, where varying levels and intensities of care and supervision, protective supervision or personal care are provided, based on their varying needs, as determined in order to be admitted and to remain in the facility. Persons under 60 years of age with compatible needs, as determined by the Department of Social Services in regulations, may be allowed to be admitted or retained in a residential-care facility for the elderly.

## DEFINITIONS

Pursuant to Health and Safety Code Section 13133, regulations of the state fire marshal pertaining to Group R, Division 2 Occupancies classified as residential facilities (RF) and residential-care facilities for the elderly (RCFE) shall apply uniformly throughout the state and no city, county, city and county, including a charter city or charter county, or fire protection district shall adopt or enforce any ordinance or local rule or regulation relating to fire and panic safety which is in consistent with these regulations. A city, county, city and county, including a charter city or charter county may pursuant to Health and Safety Code Section 13143.5, or a fire protection district may pursuant to Health and Safety Code Section 13869.7, adopt standards more stringent than those adopted by the state fire marshal that are reasonably necessary to accommodate local climate, geological, or topographical conditions relating to roof coverings for residential-care facilities for the elderly.

**RESIDENTIAL DWELLING UNIT.** [DSA-AC] A unit intended to be used as a residence that is primarily long-term in nature. Residential dwelling units do not include transient lodging, inpatient medical care, licensed long-term care, and detention or correctional facilities.

**RESIDENTIAL FACILITY (RF).** As defined in Section 1502 of the Health and Safety Code, shall mean any family home, group care facility or similar facility determined by the director of Social Services, for 24-hour nonmedical care of persons in need of personal services, supervision, or assistance essential for sustaining the activities of daily living or for the protection of the individual. Such facilities include small family homes and social rehabilitation facilities.

Pursuant to Health and Safety Code Section 13133, regulations of the state fire marshal pertaining to Group R Occupancies classified as residential facilities (RF) and residential-care facilities for the elderly (RCFE) shall apply uniformly throughout the state and no city, county, city and county, including a charter city or charter county, or fire protection district shall adopt or enforce any ordinance or local rule or regulation relating to fire and panic safety which is in consistent with these regulations. A city, county, city and county, including a charter city or charter county may pursuant to Health and Safety Code Section 13143.5, or a fire protection district may pursuant to Health and Safety Code Section 13869.7, adopt standards more stringent than those adopted by the state fire marshal that are reasonably necessary to accommodate local climate, geological, or topographical conditions relating to roof coverings for residential-care facilities for the elderly.

**RESISTANCE FACTOR.** A factor that accounts for deviations of the actual strength from the nominal strength and the manner and consequences of failure (also called "strength reduction factor").

**RESTRAINT.** [SFM] The physical retention of a person within a room, cell or cell block, holding cells, temporary holding cell, rooms or area, holding facility, secure interview rooms, courthouse holding facilities, courtroom docks, or similar buildings or portions thereof by any means, or within the exterior walls of a building by means of locked doors inoperable by the person restrained. Restraint shall also

mean the physical binding, strapping or similar restriction of any person in a chair, walker, bed or other contrivance for the purpose of deliberately restricting the free movement of ambulatory persons.

Restraint shall not be construed to include nonambulatory persons nor shall it include the use of bandage material, strip sheeting or other fabrics or materials (soft ties) used to restrain persons in hospital-type beds or wheelchairs to prevent injury, provided an approved method of quick release is maintained.

Facilities employing the use of soft ties, however, shall be classified as a building used to house nonambulatory persons. Restraint shall not be practiced in licensed facilities classified as Group R-2.1, R-3.1 and R-4 occupancies unless constructed as a Group I-3 occupancy. For Group I-3 Occupancies see Section 408.1.1.

**RESTRICTED AREA.** [OSHPD 1] (See Chapter 12, Section 1224.3 for defined term.)

**RESTRICTED ENTRANCE.** An entrance that is made available for common use on a controlled basis, but not public use, and that is not a service entrance.

**RETRACTABLE AWNING.** A retractable awning is a cover with a frame that retracts against a building or other structure to which it is entirely supported.

**RETROFIT** [DSA-SS, DSA-SS/CC, OSHPD 1, 2 & 4] The construction of any new element or system, or the alteration of any existing element or system required to bring an existing building, or portion thereof, conforming to earlier code requirements, into conformance with standards of the currently effective California Building Standards Code.

**RISER.** The upright part between two adjacent stair treads.

**RISK CATEGORY.** A categorization of buildings and other structures for determination of flood, wind, snow, ice and earthquake loads based on the risk associated with unacceptable performance.

**RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE<sub>R</sub>) GROUND MOTION RESPONSE ACCELERATIONS.** The most severe earthquake effects considered by this code, determined for the orientation that results in the largest maximum response to horizontal ground motions and with adjustment for targeted risk.

**ROOF ASSEMBLY** (For application to Chapter 15 only). A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering.

**ROOF COVERING.** The covering applied to the roof deck for weather resistance, fire classification or appearance.

**ROOF COVERING SYSTEM.** See "Roof assembly."

**ROOF DECK.** The flat or sloped surface constructed on top of the exterior walls of a building or other supports for the purpose of enclosing the story below, or sheltering an area, to protect it from the elements, not including its supporting members or vertical supports.

**ROOF DRAINAGE, POSITIVE.** See "Positive roof drainage."

**ROOF EAVE. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**ROOF EAVE SOFFIT. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**ROOF RECOVER.** The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

**ROOF REPAIR.** Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

**ROOF REPLACEMENT.** The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

**ROOF VENTILATION.** The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, attics, cathedral ceilings or other enclosed spaces over which a roof assembly is installed.

**ROOFTOP STRUCTURE.** A structure erected on top of the roof deck or on top of any part of a building.

**RUBBLE MASONRY.** Masonry composed of roughly shaped stones.

**Coursed rubble.** Masonry composed of roughly shaped stones fitting approximately on level beds and well bonded.

**Random rubble.** Masonry composed of roughly shaped stones laid without regularity of coursing but well bonded and fitted together to form well-divided joints.

**Rough or ordinary rubble.** Masonry composed of unsquared field stones laid without regularity of coursing but well bonded.

**RUGGED EQUIPMENT. [DSA-SS, DSA-SS/CC & OSHPD 1, 2, 3 & 4]** Rugged equipment refers to an amplexness of construction that gives such equipment the ability to survive earthquake strong motions without significant loss of function.

**RUNNING BOND.** The placement of masonry units such that head joints in successive courses are horizontally offset at least one-quarter the unit length.

**RUNNING SLOPE.** The slope that is parallel to the direction of travel. (As differentiated from the definition of "Cross Slope".)

**SALLYPORT.** A security vestibule with two or more doors or gates where the intended purpose is to prevent continuous and unobstructed passage by allowing the release of only one door or gate at a time.

**SANITARY FACILITY. (HCD 1 & HCD 1-AC)** Any single water closet, urinal, lavatory, bathtub or shower, or a combination thereof, together with the room or space in which they are housed.

**SCISSOR STAIR.** Two interlocking stairways providing two separate paths of egress located within one stairwell enclosure.

**SCUPPER.** An opening in a wall or parapet that allows water to drain from a roof.

**SECONDARY MEMBERS.** The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction and roof construction not having direct connections to the columns; and
3. Bracing members other than those that are part of the primary structural frame.

**SECURE INTERVIEW ROOMS.** A lockable room used to hold and interview detainees for further processing.

**SEISMIC DESIGN CATEGORY.** A classification assigned to a structure based on its risk category and the severity of the design earthquake ground motion at the site.

**SEISMIC FORCE-RESISTING SYSTEM.** That part of the structural system that has been considered in the design to provide the required resistance to the prescribed seismic forces.

**SELF-CLOSING.** As applied to a fire door or other opening protective, means equipped with an device that will ensure closing after having been opened.

**SELF-LUMINOUS.** Illuminated by a self-contained power source, other than batteries, and operated independently of external power sources.

**SELF-PRESERVATION, INCAPABLE OF.** See "Incapable of self-preservation."

**SELF-SERVICE STORAGE. [DSA-AC]** Building or facility designed and used for the purpose of renting or leasing individual storage spaces to customers for the purpose of storing and removing personal property on a self-service basis.

**[F] SERVICE CORRIDOR.** A fully enclosed passage used for transporting HPM and purposes other than required means of egress.

**SERVICE ENTRANCE.** An entrance intended primarily for delivery of goods or services.

**SHAFT.** An enclosed space extending through one or more stories of a building, connecting vertical openings in successive floors, or floors and roof.

**SHAFT ENCLOSURE.** The walls or construction forming the boundaries of a shaft.

**SHALL. [DSA-AC]** Denotes a mandatory specification or requirement.

**SHALLOW FOUNDATION.** A shallow foundation is an individual or strip footing, a mat foundation, a slab-on-grade foundation or a similar foundation element.

**SHALLOW POOL.** A pool that has a maximum depth of less than 6 feet (1829 mm).

**SHEAR WALL.** (For Chapter 23) A wall designed to resist lateral forces parallel to the plane of a wall.

## DEFINITIONS

**Shear wall, perforated.** A wood structural panel sheathed wall with openings, that has not been specifically designed and detailed for force transfer around openings.

**Shear wall segment, perforated.** A section of shear wall with full-height sheathing that meets the height-to-width ratio limits of Section 4.3.4 of AF&PA SDPWS.

### SHEAR WALL (For Chapter 21)

**Detailed plain masonry shear wall.** A masonry shear wall designed to resist lateral forces neglecting stresses in reinforcement, and designed in accordance with Section 2106.1.

**Intermediate prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.

**Intermediate reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.

**Ordinary plain masonry shear wall.** A masonry shear wall designed to resist lateral forces neglecting stresses in reinforcement, and designed in accordance with Section 2106.1.

**Ordinary plain prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.

**Ordinary reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.

**Special prestressed masonry shear wall.** A prestressed masonry shear wall designed to resist lateral forces considering stresses in reinforcement and designed in accordance with Section 2106.1 except that only grouted, laterally restrained tendons are used.

**Special reinforced masonry shear wall.** A masonry shear wall designed to resist lateral forces considering stresses in reinforcement, and designed in accordance with Section 2106.1.

► **SHOPPING CENTER (OR SHOPPING MALL).** [DSA-AC] One or more sales or rental establishments or stores. A shopping center may include a series of buildings on a common site, connected by a common pedestrian access route on, above or below the ground floor, that is either under common ownership or common control or developed either as one project or as a series of related projects. For the purposes of this section, "shopping center" or "shopping mall" includes a covered mall building.

**SHOULD.** [DSA-AC] Denotes an advisory specification or recommendation. [HCD 1 & HCD 2] See "Recommend."

**SIDEWALK.** A surfaced pedestrian way contiguous to a street used by the public. (As differentiated from the definition of "Walk".)

**SIGNAGE [DSA-AC]** Displayed verbal, symbolic, tactile, and/or pictorial information.

**SIGNIFICANT LOSS OF FUNCTION. [DSA-SS, DSA-SS/CC & OSHPD 1, 2, & 4]** Significant loss of function for equipment or components means the equipment or component cannot be restored to its original function by competent technicians after a design earthquake because the equipment or component require parts that are not normally stocked by the owner or not readily available.

**SINGLE-ACCOMMODATION SANITARY FACILITY. [HCD 1-AC]** A room that has not more than one of each type of sanitary fixture, is intended for use by only one person at a time, has no partition around the toilet, and has a door that can be locked on the inside by the room occupant.

**SINGLE-PLY MEMBRANE.** A roofing membrane that is field applied using one layer of membrane material (either homogeneous or composite) rather than multiple layers.

**[F] SINGLE-STATION SMOKE ALARM.** An assembly incorporating the detector, the control equipment and the alarm-sounding device in one unit, operated from a power supply either in the unit or obtained at the point of installation.

**SINK.** A fixed bowl or basin with running water and drainpipe, as in a kitchen or laundry, for washing dishes, clothing, etc. (As differentiated from the definition of "Lavatory".)

**SITE.** A parcel of land bounded by a lot line or a designated portion of a public right-of-way.

**SITE CLASS.** A classification assigned to a site based on the types of soils present and their engineering properties as defined in Section 1613.3.2.

**SITE COEFFICIENTS.** The values of  $F_a$  and  $F_v$  indicated in Tables 1613.3.3(1) and 1613.3.3(2), respectively.

**SITE DEVELOPMENT. [HCD 1-AC]** "On-site" and "off-site" work, including, but not limited to, walks, sidewalks, ramps, curbs, curb ramps, parking facilities, stairs, planting areas, pools, promenades, exterior gathering or assembly areas and raised or depressed paved areas.

**SITE-FABRICATED STRETCH SYSTEM.** A system, fabricated on site and intended for acoustical, tackable or aesthetic purposes, that is comprised of three elements:

1. A frame (constructed of plastic, wood, metal or other material) used to hold fabric in place,
2. A core material (infill, with the correct properties for the application), and
3. An outside layer, comprised of a textile, fabric or vinyl, that is stretched taut and held in place by tension or mechanical fasteners via the frame.

**SKYLIGHT, UNIT.** A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.

**SKYLIGHTS AND SLOPED GLAZING.** Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing mate-

rial in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls, are included in this definition.

**SLEEPING ACCOMMODATIONS.** *Rooms intended and designed for sleeping.*

**SLEEPING UNIT.** A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

**SLIP RESISTANT.** *A rough finish that is not abrasive to the bare foot.*

**SLOPE.** [HCD 1-AC] *The relative steepness of the land between two points and is calculated as follows:*

*The horizontal distance and elevation change between the two points (e.g., an entrance and a passenger loading zone). The difference in elevation is divided by the distance and the resulting fraction is multiplied by 100 to obtain the percentage of slope.*

*For example: if a principal entrance is 10 feet (3048 mm) from a passenger loading zone, and the principal entrance is raised 1 foot (305 mm) higher than the passenger loading zone, then the slope is 1/10 100 = 10 percent.*

**SMALL MANAGEMENT YARD.** *An exterior exercise yard within a Group I-3 prison used for inmate exercise for a maximum of 2 hours per day, constructed in accordance with Section 408.1.2.3.*

**[F] SMOKE ALARM.** A single- or multiple-station alarm responsive to smoke. See also definitions of "Multiple-station smoke alarm" and "Single station smoke alarm."

**SMOKE BARRIER.** A continuous membrane, either vertical or horizontal, such as a wall, floor or ceiling assembly, that is designed and constructed to restrict the movement of smoke.

**SMOKE COMPARTMENT.** A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

**SMOKE DAMPER.** A listed device installed in ducts and air transfer openings designed to resist the passage of smoke. The device is installed to operate automatically, controlled by a smoke detection system, and where required, is capable of being positioned from a fire command center.

**[F] SMOKE DETECTOR.** A listed device that senses visible or invisible particles of combustion.

**SMOKE-DEVELOPED INDEX.** A comparative measure, expressed as a dimensionless number, derived from measurements of smoke obscuration versus time for a material tested in accordance with ASTM E 84.

**SMOKE-PROTECTED ASSEMBLY SEATING.** Seating served by means of egress that is not subject to smoke accumulation within or under a structure.

**SMOKEPROOF ENCLOSURE.** An exit stairway designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

**SOFT CONTAINED PLAY STRUCTURE.** [DSA-AC] *A play structure made up of one or more play components*

*where the user enters a fully enclosed play environment that utilizes pliable materials, such as plastic, netting or fabric.*

**[F] SOLID.** A material that has a melting point, decomposes or sublimes at a temperature greater than 68°F (20°C).

**SPACE.** *A definable area, such as, a room, toilet room, hall, assembly area, entrance, storage room, alcove, courtyard, or lobby.*

**SPC 1, SPC 2, SPC 3, SPC 4 and SPC 5** are the building structural performance categories for Hospital Buildings defined in Table 2.5.3 of California Administrative Code (Part 1, Title 24 CCR), Chapter 6.

**SPC BUILDING.** [OSHPD 1] *Means a structure with an independent vertical and lateral force-resisting system (LFRS) and a distinct building structural performance category assigned by OSHPD.*

**SPECIAL AMUSEMENT BUILDING.** A special amusement building is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

**SPECIAL FLOOD HAZARD AREA.** The land area subject to flood hazards and shown on a *Flood Insurance Rate Map* or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE or V1-30.

**SPECIAL INSPECTION.** Inspection of construction requiring the expertise of an approved special inspector in order to ensure compliance with this code and the approved construction documents.

**Continuous special inspection.** Special inspection by the special inspector who is present when and where the work to be inspected is being performed.

**Periodic special inspection.** Special inspection by the special inspector who is intermittently present where the work to be inspected has been or is being performed.

**SPECIAL INSPECTOR.** A qualified person employed or retained by an approved agency and approved by the building official as having the competence necessary to inspect a particular type of construction requiring special inspection.

**SPECIAL STRUCTURAL WALL.** See Section 1905.1.1.

**SPECIFIED.** Required by construction documents.

**SPECIFIED COMPRESSIVE STRENGTH OF MASONRY,  $f'_m$ .** Minimum compressive strength, expressed as force per unit of net cross-sectional area, required of the masonry used in construction by the construction documents, and upon which the project design is based. Whenever the quantity  $f'_m$  is under the radical sign, the square root of numerical value only is intended and the result has units of pounds per square inch (psi) (MPa).

**SPECIFIED PUBLIC TRANSPORTATION.** [DSA-AC] *Transportation by bus, rail, or any other conveyance (other than aircraft) provided by a private entity to the general pub-*

## DEFINITIONS

*lic, with general or special service (including charter service) on a regular and continuing basis.*

**SPLICE.** The result of a factory and/or field method of joining or connecting two or more lengths of a fire-resistant joint system into a continuous entity.

**SPRAYED FIRE-RESISTANT MATERIALS.** Cementitious or fibrous materials that are sprayed to provide fire-resistant protection of the substrates.

**STACK BOND.** The placement of masonry units in a bond pattern is such that head joints in successive courses are vertically aligned. For the purpose of this code, requirements for stack bond shall apply to masonry laid in other than running bond.

**STAGE.** A space within a building utilized for entertainment or presentations, which includes overhead hanging curtains, drops, scenery or stage effects other than lighting and sound.

**STAIR.** A change in elevation, consisting of one or more risers.

**STAIRS.** *A series of two or more steps.*

**STAIR, SCISSOR.** See "Scissor stair."

**STAIRWAY.** One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

**STAIRWAY, EXIT ACCESS.** See "Exit access stairway."

**STAIRWAY, EXTERIOR.** A stairway that is open on at least one side, except for required structural columns, beams, handrails and guards. The adjoining open areas shall be either yards, courts or public ways. The other sides of the exterior stairway need not be open.

**STAIRWAY, INTERIOR.** A stairway not meeting the definition of an exterior stairway.

**STAIRWAY, INTERIOR EXIT.** See "Interior exit stairway."

**STAIRWAY, SPIRAL.** A stairway having a closed circular form in its plan view with uniform section-shaped treads attached to and radiating from a minimum-diameter supporting column.

**[F] STANDPIPE SYSTEM, CLASSES OF.** Standpipe classes are as follows:

**Class I system.** A system providing 2 $\frac{1}{2}$ -inch (64 mm) hose connections to supply water for use by fire departments and those trained in handling heavy fire streams.

**Class II system.** A system providing 1 $\frac{1}{2}$ -inch (38 mm) hose stations to supply water for use primarily by the building occupants or by the fire department during initial response.

**Class III system.** A system providing 1 $\frac{1}{2}$ -inch (38 mm) hose stations to supply water for use by building occupants and 2 $\frac{1}{2}$ -inch (64 mm) hose connections to supply a larger volume of water for use by fire departments and those trained in handling heavy fire streams.

**[F] STANDPIPE, TYPES OF.** Standpipe types are as follows:

**Automatic dry.** A dry standpipe system, normally filled with pressurized air, that is arranged through the use of a

device, such as dry pipe valve, to admit water into the system piping automatically upon the opening of a hose valve. The water supply for an automatic dry standpipe system shall be capable of supplying the system demand.

**Automatic wet.** A wet standpipe system that has a water supply that is capable of supplying the system demand automatically.

**Manual dry.** A dry standpipe system that does not have a permanent water supply attached to the system. Manual dry standpipe systems require water from a fire department pumper to be pumped into the system through the fire department connection in order to meet the system demand.

**Manual wet.** A wet standpipe system connected to a water supply for the purpose of maintaining water within the system but does not have a water supply capable of delivering the system demand attached to the system. Manual-wet standpipe systems require water from a fire department pumper (or the like) to be pumped into the system in order to meet the system demand.

**Semiautomatic dry.** A dry standpipe system that is arranged through the use of a device, such as a deluge valve, to admit water into the system piping upon activation of a remote control device located at a hose connection. A remote control activation device shall be provided at each hose connection. The water supply for a semiautomatic dry standpipe system shall be capable of supplying the system demand.

**START OF CONSTRUCTION.** The date of issuance for new construction and substantial improvements to existing structures, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement is within 180 days after the date of issuance. The actual start of construction means the first placement of permanent construction of a building (including a manufactured home) on a site, such as the pouring of a slab or footings, installation of pilings or construction of columns.

Permanent construction does not include land preparation (such as clearing, excavation, grading or filling), the installation of streets or walkways, excavation for a basement, footings, piers or foundations, the erection of temporary forms or the installation of accessory buildings such as garages or sheds not occupied as dwelling units or not part of the main building. For a substantial improvement, the actual "start of construction" means the first alteration of any wall, ceiling, floor or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

**STATE-OWNED/LEASED BUILDING. [SFM]** *State-Owned/Leased Building is a building or portion of a building that is owned, leased or rented by the state. State-leased buildings shall include all required exits to a public way serving such leased area or space. Portions of state-leased buildings that are not leased or rented by the state shall not be included within the scope of this section unless such portions present an exposure hazard to the state-leased area or space.*

**STATE RESPONSIBILITY AREA. [SFM]** *(See Chapter 7A, Section 702A for definition of term.)*

**STATION. [SFM]** (See Chapter 4, Section 433 for definition of term.)

**STATION PLATFORM. [SFM]** (See Chapter 4, Section 433 for definition of term.)

**STEEL CONSTRUCTION, COLD-FORMED.** That type of construction made up entirely or in part of steel structural members cold formed to shape from sheet or strip steel such as roof deck, floor and wall panels, studs, floor joists, roof joists and other structural elements.

**STEEL JOIST.** Any steel structural member of a building or structure made of hot-rolled or cold-formed solid or open-web sections, or riveted or welded bars, strip or sheet steel members, or slotted and expanded, or otherwise deformed rolled sections.

**STEEL MEMBER, STRUCTURAL.** Any steel structural member of a building or structure consisting of a rolled steel structural shape other than cold-formed steel, or steel joist members.

**STEEP SLOPE.** A roof slope greater than two units vertical in 12 units horizontal (17-percent slope).

**STEPS, RECESSED STEPS, LADDERS AND RECESSED TREADS.** Those means of entry and exit to and from the pool which may be used in conjunction with each other.

**STEP.** A riser and tread.

**STONE MASONRY.** Masonry composed of field, quarried or cast stone units bonded by mortar.

**Ashlar stone masonry.** Stone masonry composed of rectangular units having sawed, dressed or squared bed surfaces and bonded by mortar.

**Rubble stone masonry.** Stone masonry composed of irregular-shaped units bonded by mortar.

**[F] STORAGE, HAZARDOUS MATERIALS.** The keeping, retention or leaving of hazardous materials in closed containers, tanks, cylinders, or similar vessels; or vessels supplying operations through closed connections to the vessel.

**STORM SHELTER.** A building, structure or portions thereof, constructed in accordance with ICC 500 and designated for use during a severe wind storm event, such as a hurricane or tornado.

**Community storm shelter.** A storm shelter not defined as a "Residential Storm Shelter."

**Residential storm shelter.** A storm shelter serving occupants of dwelling units and having an occupant load not exceeding 16 persons.

**STORY.** That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (also see "Basement," "Building height," "Grade plane" and "Mezzanine"). It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

**[DSA-AC]** That portion of a building or facility designed for human occupancy included between the upper surface of a floor and upper surface of the floor or roof next above. A story containing one or more mezzanines has more than one floor level. If the finished floor level directly above a base-

ment or unused under-floor space is more than six feet (1829 mm) above grade for more than 50 percent of the total perimeter or is more than 12 feet (3658 mm) above grade at any point, the basement or unused under-floor space shall be considered as a story.

**STORY ABOVE GRADE PLANE.** Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

#### STRENGTH (For Chapter 21).

**Design strength.** Nominal strength multiplied by a strength reduction factor.

**Nominal strength.** Strength of a member or cross section calculated in accordance with these provisions before application of any strength-reduction factors.

**Required strength.** Strength of a member or cross section required to resist factored loads.

#### STRENGTH (For Chapter 16).

**Nominal strength.** The capacity of a structure or member to resist the effects of loads, as determined by computations using specified material strengths and dimensions and equations derived from accepted principles of structural mechanics or by field tests or laboratory tests of scaled models, allowing for modeling effects and differences between laboratory and field conditions.

**Required strength.** Strength of a member, cross section or connection required to resist factored loads or related internal moments and forces in such combinations as stipulated by these provisions.

**Strength Design.** A method of proportioning structural members such that the computed forces produced in the members by factored loads do not exceed the member design strength [also called "load and resistance factor design" (LRFD)]. The term "strength design" is used in the design of concrete and masonry structural elements.

**STRUCTURAL COMPOSITE LUMBER.** Structural member manufactured using wood elements bonded together with exterior adhesives. Examples of structural composite lumber are:

**Laminated strand lumber (LSL).** A composite of wood strand elements with wood fibers primarily oriented along the length of the member, where the least dimension of the wood strand elements is 0.10 inches (2.54 mm) or less and their average lengths are a minimum of 150 times the least dimension of the wood strand elements.

**Laminated veneer lumber (LVL).** A composite of wood veneer sheet elements with wood fibers primarily oriented along the length of the member, where the veneer element thicknesses are 0.25 inches (6.4 mm) or less.

**Oriented strand lumber (OSL).** A composite of wood strand elements with wood fibers primarily oriented along the length of the member, where the least dimension of the wood strand elements is 0.10 inches (2.54 mm) or less and their average lengths are a minimum of 75 times and less than 150 times the least dimension of the wood strand elements.

## DEFINITIONS

**Parallel strand lumber (PSL).** A composite of wood strand elements with wood fibers primarily oriented along the length of the member where the least dimension of the wood strand elements is 0.25 inches (6.4 mm) or less and their average lengths are a minimum of 300 times the least dimension of the wood strand elements.

**STRUCTURAL FRAME. [DSA-AC]** *The columns and the girders, beams and trusses having direct connections to the columns and all other members that are essential to the stability of the building or facility as a whole.*

**STRUCTURAL GLUED-LAMINATED TIMBER.** An engineered, stress-rated product of a timber laminating plant, comprised of assemblies of specially selected and prepared wood laminations in which the grain of all laminations is approximately parallel longitudinally and the laminations are bonded with adhesives.

**STRUCTURAL OBSERVATION.** The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents. Structural observation does not include or waive the responsibility for the inspection required by Section 110, 1705 or other sections of this code.

**[A] STRUCTURE.** That which is built or constructed.

**SUBDIAPHRAGM.** A portion of a larger wood diaphragm designed to anchor and transfer local forces to primary diaphragm struts and the main diaphragm.

**SUBSTANTIAL DAMAGE.** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

**SUBSTANTIAL IMPROVEMENT.** Any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.
2. Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.

**SUBSTANTIAL STRUCTURAL DAMAGE. [OSHPD 1 & 4]** A condition where:

1. In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than 10 percent from its predamage condition; or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floors and roofs has been reduced more than 10 percent from its predamage condition and the remaining capacity of such

affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

**SUBSTANTIAL STRUCTURAL DAMAGE.** A condition where:

1. In any *story*, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than 33 percent from its predamage condition; or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floors and roofs has been reduced more than 20 percent from its predamage condition and the remaining capacity of such affected elements, with respect to all dead and *live loads*, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

**[E] SUNROOM.** A one-story structure attached to a building with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls and roof.

**[F] SUPERVISING STATION.** A facility that receives signals and at which personnel are in attendance at all times to respond to these signals.

**[F] SUPERVISORY SERVICE.** The service required to monitor performance of guard tours and the operative condition of fixed suppression systems or other systems for the protection of life and property.

**[F] SUPERVISORY SIGNAL.** A signal indicating the need of action in connection with the supervision of guard tours, the fire suppression systems or equipment or the maintenance features of related systems.

**[F] SUPERVISORY SIGNAL-INITIATING DEVICE.** An initiation device, such as a valve supervisory switch, water-level indicator or low-air pressure switch on a dry-pipe sprinkler system, whose change of state signals an off-normal condition and its restoration to normal of a fire protection or life safety system, or a need for action in connection with guard tours, fire suppression systems or equipment or maintenance features of related systems.

**SUSCEPTIBLE BAY.** A roof or portion thereof with:

1. A slope less than  $\frac{1}{4}$ -inch per foot (0.0208 rad); or
2. On which water is impounded upon it, in whole or in part, and the secondary drainage system is functional but the primary drainage system is blocked.

A roof surface with a slope of  $\frac{1}{4}$ -inch per foot (0.0208 rad) or greater towards points of free drainage is not a susceptible bay.

**SWIMMING POOL.** Any structure intended for swimming, recreational bathing or wading that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground and on-ground pools; hot tubs; spas and fixed-in-place wading pools.

**T RATING.** The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the nonfire side when tested in accordance with ASTM E 814 or UL 1479.

**TACTILE.** An object that can be perceived using the sense of touch.

**TACTILE SIGN.** A sign containing raised characters and/or symbols and accompanying Braille.

**TECHNICAL PRODUCTION AREA.** Open elevated areas or spaces intended for entertainment technicians to walk on and occupy for servicing and operating entertainment technology systems and equipment. Galleries, including fly and lighting galleries, gridirons, catwalks, and similar areas are designed for these purposes.

**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.

**TEEING GROUND. [DSA-AC]** In golf, the starting place for the hole to be played.

**TEMPORARY [DSA-AC]** Buildings and facilities intended for use at one location for not more than one year and seats intended for use at one location for not more than 90 days.

**TEMPORARY HOLDING CELL, ROOM or AREA. [CSA and SFM]** Temporary Holding cell, room or area shall mean a room for temporary holding of inmates, detainees or in-custody individuals for less than 24 hours.

**TEMPORARY HOLDING FACILITY [SFM]** A building or portion of a building, operated by law enforcement personnel, with one or more temporary holding cells or rooms.

**TENABLE ENVIRONMENT [SFM]** Tenable environment shall mean an environment in which the products of combustion, toxic gases, smoke and heat are limited or otherwise restricted to maintain the impact on occupants to a level that is not life threatening.

**TENT.** A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects.

**TERMINALLY ILL.** As termed for an individual, means the individual has a life expectancy of six months or less as stated in writing by his or her attending physician and surgeon.

**TESTING AGENCY. (HCD 1 & HCD 2)** An agency approved by the department as qualified and equipped for testing of products, materials, equipment and installations in accordance with nationally recognized standards. For additional information, see Health and Safety Code Section 17920(m).

**TEXT TELEPHONE.** Machinery or equipment that employs interactive text-based communications through the transmission of coded signals across the standard telephone network. Text telephones can include, for example, devices known as TTYS (teletypewriters) or computers.

**[E] THERMAL ISOLATION.** A separation of conditioned spaces, between a sunroom and a dwelling unit, consisting of existing or new walls, doors or windows.

**THERMOPLASTIC MATERIAL.** A plastic material that is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

**THERMOSETTING MATERIAL.** A plastic material that is capable of being changed into a substantially nonreformable product when cured.

**THIN-BED MORTAR.** Mortar for use in construction of AAC unit masonry with joints 0.06 inch (1.5 mm) or less.

**THROUGH PENETRATION.** A breach in both sides of a floor, floor-ceiling or wall assembly to accommodate an item passing through the breaches.

**THROUGH-PENETRATION FIRESTOP SYSTEM.** An assemblage consisting of a fire-resistance-rated floor, floor-ceiling, or wall assembly, one or more penetrating items passing through the breaches in both sides of the assembly and the materials or devices, or both, installed to resist the spread of fire through the assembly for a prescribed period of time.

**TIE-DOWN (HOLD-DOWN).** A device used to resist uplift of the chords of shear walls.

**TIE, WALL.** Metal connector that connects wythes of masonry walls together.

**TILE, STRUCTURAL CLAY.** A hollow masonry unit composed of burned clay, shale, fire clay or mixture thereof, and having parallel cells.

**[F] TIRES, BULK STORAGE OF.** Storage of tires where the area available for storage exceeds 20,000 cubic feet (566 m<sup>3</sup>).

**[A] TOWNHOUSE.** A single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

**[F] TOXIC.** A chemical falling within any of the following categories:

1. A chemical that has a median lethal dose ( $LD_{50}$ ) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

2. A chemical that has a median lethal dose ( $LD_{50}$ ) of more than 200 milligrams per kilogram, but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.

3. A chemical that has a median lethal concentration ( $LC_{50}$ ) in air of more than 200 parts per million, but not more than 2,000 parts per million by volume of gas or vapor, or more than 2 milligrams per liter but not more than 20 milligrams per liter of mist, fume or dust, when administered by continuous inhalation for 1 hour (or

## DEFINITIONS

less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

**TRANSFER DEVICE. [DSA-AC]** Equipment designed to facilitate the transfer of a person from a wheelchair or other mobility aid to and from an amusement ride seat.

**TRANSIENT.** Occupancy of a dwelling unit or sleeping unit for not more than 30 days.

**TRANSIENT AIRCRAFT.** Aircraft based at another location and that is at the transient location for not more than 90 days.

**TRANSIENT LODGING.** A building or facility containing one or more guest room(s) for sleeping that provides accommodations that are primarily short-term in nature (generally 30 days or less). Transient lodging does not include residential dwelling units intended to be used as a residence, inpatient medical care facilities, licensed long-term care facilities, detention or correctional facilities, or private buildings or facilities that contain no more than five rooms for rent or hire and that are actually occupied by the proprietor as the residence of such proprietor.

[DSA-AC] See also the definition of Place of Public Accommodation.

**TRANSIT BOARDING PLATFORM. [DSA-AC]** A horizontal, generally level surface, whether raised above, recessed below or level with a transit rail, from which persons embark/disembark a fixed rail vehicle.

**TRANSITION PLATE. [DSA-AC]** A sloping pedestrian walking surface located at the end(s) of a gangway.

**TREAD.** The horizontal part of a step.

**TREATED WOOD.** Wood and wood-based materials that use vacuum-pressure impregnation processes to enhance fire retardant or preservative properties.

**Fire-retardant-treated wood.** Pressure-treated lumber and plywood that exhibit reduced surface-burning characteristics and resist propagation of fire.

**Preservative-treated wood.** Pressure-treated wood products that exhibit reduced susceptibility to damage by fungi, insects or marine borers.

**TREATMENT OF WATER.** The process of conditioning and disinfection of pool water by means of a combination of filtration and the addition of chemicals to the water.

**TRIM.** Picture molds, chair rails, baseboards, handrails, door and window frames and similar decorative or protective materials used in fixed applications.

**[F] TROUBLE SIGNAL.** A signal initiated by the fire alarm system or device indicative of a fault in a monitored circuit or component.

**TTY.** An abbreviation for teletypewriter. Machinery that employs interactive text-based communication through the transmission of coded signals across the telephone network. TTYS may include, for example, devices known as TDDs (telecommunication display devices or telecommunication devices for deaf persons) or computers with special modems. TTYS are also called text telephones.

**TUBULAR DAYLIGHTING DEVICE (TDD).** A non-operable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent ceiling panel. The unit can be factory assembled, or field-assembled from a manufactured kit.

**24-HOUR CARE.** See "24-hour care" located preceding "AAC masonry."

**TURNOVER TIME.** The period of time, in hours, required to circulate a volume of water equal to the pool capacity.

**UNDERGROUND STATION. [SFM]** (See Chapter 4, Section 433 for definition of term.)

**UNDERLAYMENT.** One or more layers of felt, sheathing paper, nonbituminous saturated felt or other approved material over which a steep-slope roof covering is applied.

**UNIFORMITY COEFFICIENT.** The ratio of theoretical size of a sieve that will pass 60 percent of the sand to the theoretical size of sieve that will pass 10 percent.

**UNIT SKYLIGHT.** See "Skylight, unit."

**UNREASONABLE HARDSHIP.** When the enforcing agency finds that compliance with the building standard would make the specific work of the project affected by the building standard infeasible, based on an overall evaluation of the following factors:

1. The cost of providing access.
2. The cost of all construction contemplated.
3. The impact of proposed improvements on financial feasibility of the project.
4. The nature of the accessibility which would be gained or lost.
5. The nature of the use of the facility under construction and its availability to persons with disabilities.

The details of any finding of unreasonable hardship shall be recorded and entered in the files of the enforcing agency.

**[F] UNSTABLE (REACTIVE) MATERIAL.** A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:

**Class 4.** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

**Class 3.** Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class

includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

**Class 3.** Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation. This class includes materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures.

**Class 2.** Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.

**Class 1.** Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressure.

**[F] USE (MATERIAL).** Placing a material into action, including solids, liquids and gases.

**USE ZONE.** *[DSA-AC]* The ground level area beneath and immediately adjacent to a play structure or play equipment that is designated by ASTM F 1487 for unrestricted circulation around the play equipment and where it is predicted that a user would land when falling from or exiting the play equipment.

**VALUATION THRESHOLD.** *[DSA-AC]* An annually adjusted, dollar-amount figure used in part to determine the extent of required path of travel upgrades. The baseline valuation threshold of \$50,000 is based on the January 1981, "ENR US20 Cities" Average Construction Cost Index (CCI) of 3372.02 as published in Engineering News Record, McGraw Hill Publishing Company. The current valuation threshold is determined by multiplying the baseline valuation threshold by a ratio of the current year's January CCI to the baseline January 1981 CCI.

**VAPOR PERMEABLE MEMBRANE.** The property of having a moisture vapor permeance rating of 10 perms ( $5.7 \times 10-10 \text{ kg/Pa} \times \text{s} \times \text{m}^2$ ) or greater, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. A vapor permeable material permits the passage of moisture vapor.

**VAPOR RETARDER CLASS.** A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E 96 as follows:

**Class I:** 0.1 perm or less.

**Class II:**  $0.1 < \text{perm} \leq 1.0 \text{ perm}$ .

**Class III:**  $1.0 < \text{perm} \leq 10 \text{ perm}$ .

**VARIABLE MESSAGE SIGNS (VMS).** *[DSA-AC]* Electronic signs that have a message with the capacity to change by means of scrolling, streaming, or paging across a background.

**VARIABLE MESSAGE SIGN (VMS) CHARACTERS.** *[DSA-AC]* Characters of an electronic sign are composed of pixels in an array. High resolution VMS characters have vertical pixel counts of 16 rows or greater. Low resolution VMS characters have vertical pixel counts of 7 to 15 rows.

**VEHICLE BARRIER.** A component or a system of components, near open sides of a garage floor or ramp or building walls that act as restraints for vehicles.

**VEHICULAR GATE.** A gate that is intended for use at a vehicular entrance or exit to a facility, building or portion thereof, and that is not intended for use by pedestrian traffic.

**VEHICULAR OR PEDESTRIAN ARRIVAL POINTS.** *[HCD 1-AC]* Public or resident parking areas, public transportation stops, passenger loading zones, and public streets or sidewalks.

**VEHICULAR WAY.** A route provided for vehicular traffic, such as in a street, driveway, or parking facility.

**VENEER.** A facing attached to a wall for the purpose of providing ornamentation, protection or insulation, but not counted as adding strength to the wall.

**[M] VENTILATION.** The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

**VINYL SIDING.** A shaped material, made principally from rigid polyvinyl chloride (PVC), that is used as an exterior wall covering.

**[F] VISIBLE ALARM NOTIFICATION APPLIANCE.** A notification appliance that alerts by the sense of sight.

**WAITING ROOM.** *[SFM]* Waiting room is a room or area normally provided with seating and used for persons waiting.

**WALK.** *[DSA-AC]* An exterior prepared surface for pedestrian use, including pedestrian areas such as plazas and courts. (As differentiated from the definition of "Sidewalk".) *[HCD 1-AC]* A surfaced pedestrian way not located contiguous to a street used by the public. (See also "Sidewalk".)

**WALKWAY, PEDESTRIAN.** A walkway used exclusively as a pedestrian trafficway.

**WALL.** A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

**Cavity wall.** A wall built of masonry units or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.

**Composite wall.** A wall built of a combination of two or more masonry units bonded together, one forming the backup and the other forming the facing elements.

**Dry-stacked, surface-bonded wall.** A wall built of concrete masonry units where the units are stacked dry, without mortar on the bed or head joints, and where both sides of the wall are coated with a surface-bonding mortar.

**Masonry-bonded hollow wall.** A multi-wythe wall built of masonry units arranged to provide an air space between the wythes and with the wythes bonded together with masonry units.

**Parapet wall.** The part of any wall entirely above the roof line.

**WALL, LOAD-BEARING.** Any wall meeting either of the following classifications:

1. Any metal or wood stud wall that supports more than 100 pounds per linear foot (1459 N/m) of vertical load in addition to its own weight.
2. Any masonry or concrete wall that supports more than 200 pounds per linear foot (2919 N/m) of vertical load in addition to its own weight.

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**WALL, NONLOAD-BEARING.** Any wall that is not a load-bearing wall.

**WALL PIER.** See Section 1905.1.1.

**WATERLINE.** Shall be defined as one of the following:

1. *Skimmer systems. The waterline shall be the midpoint of the operating range of the skimmers.*
2. *Overflow system. The waterline shall be the top edge of the overflow rim.*

**[F] WATER-REACTIVE MATERIAL.** A material that explodes; violently reacts; produces flammable, toxic or other hazardous gases; or evolves enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture. Water-reactive materials are subdivided as follows:

**Class 3.** Materials that react explosively with water without requiring heat or confinement.

**Class 2.** Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases or evolve enough heat to cause autoignition or ignition of combustibles upon exposure to water or moisture.

**Class 1.** Materials that react with water with some release of energy, but not violently.

**WATER-RESISTIVE BARRIER.** A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

**WEATHER-EXPOSED SURFACES.** Surfaces of walls, ceilings, floors, roofs, soffits and similar surfaces exposed to the weather except the following:

1. Ceilings and roof soffits enclosed by walls, fascia, bulkheads or beams that extend a minimum of 12 inches (305 mm) below such ceiling or roof soffits.
2. Walls or portions of walls beneath an unenclosed roof area, where located a horizontal distance from an open exterior opening equal to at least twice the height of the opening.
3. Ceiling and roof soffits located a minimum horizontal distance of 10 feet (3048 mm) from the outer edges of the ceiling or roof soffits.

**WET BAR. [DSA-AC]** An area or space with a counter equipped with a sink and running water but without cooking facilities.

**[F] WET-CHEMICAL EXTINGUISHING SYSTEM.** A solution of water and potassium-carbonate-based chemical, potassium-acetate-based chemical or a combination thereof, forming an extinguishing agent.

**WHEELCHAIR.** A chair mounted on wheels to be propelled by its occupant manually or with the aid of electric power, of a size and configuration conforming to the recognized standard models of the trade.

**WHEELCHAIR SPACE.** A space for a single wheelchair and its occupant.

**WILDFIRE. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**WILDFIRE EXPOSURE. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**WILDLAND-URBAN INTERFACE FIRE AREA. [SFM]** (See Chapter 7A, Section 702A for defined term.)

**WINERY CAVES.** See Section 436.

**WIND-BORNE DEBRIS REGION.** Areas within hurricane-prone regions located:

1. Within 1 mile (1.61 km) of the coastal mean high water line where the ultimate design wind speed,  $V_{ult}$  is 130 mph (58 m/s) or greater; or
2. In areas where the ultimate design wind speed is 140 mph (63.6 m/s) or greater; or Hawaii.

For Risk Category II buildings and structures and Risk Category III buildings and structures, except health care facilities, the windborne debris region shall be based on Figure 1609A. For Risk Category IV buildings and structures and Risk Category III health care facilities, the windborne debris region shall be based on Figure 1609B.

**WINDFORCE-RESISTING SYSTEM, MAIN.** See "Main Windforce-Resisting System."

**WIND SPEED,  $V_{ult}$**  Ultimate design wind speeds.

**WIND SPEED,  $V_{asd}$**  Nominal design wind speeds.

**WINDER.** A tread with nonparallel edges.

**WIRE BACKING.** Horizontal strands of tautened wire attached to surfaces of vertical supports which, when covered with the building paper, provide a backing for cement plaster

**[F] WIRELESS PROTECTION SYSTEM.** A system or a part of a system that can transmit and receive signals without the aid of wire.

**WOOD SHEAR PANEL.** A wood floor, roof or wall component sheathed to act as a shear wall or diaphragm.

**WOOD STRUCTURAL PANEL.** A panel manufactured from veneers, wood strands or wafers or a combination of veneer and wood strands or wafers bonded together with waterproof synthetic resins or other suitable bonding systems. Examples of wood structural panels are:

**Composite panels.** A wood structural panel that is comprised of wood veneer and reconstituted wood-based material and bonded together with waterproof adhesive;

**Oriented strand board (OSB).** A mat-formed wood structural panel comprised of thin rectangular wood strands arranged in cross-aligned layers with surface layers normally arranged in the long panel direction and bonded with waterproof adhesive; or

**Plywood.** A wood structural panel comprised of plies of wood veneer arranged in cross-aligned layers. The plies are bonded with waterproof adhesive that cures on application of heat and pressure.

**[F] WORKSTATION.** A defined space or an independent principal piece of equipment using HPM within a fabrication area where a specific function, laboratory procedure or research activity occurs. Approved or listed hazardous materials storage cabinets, flammable liquid storage cabinets or gas cabinets serving a workstation are included as part of the workstation. A workstation is allowed to contain ventilation

equipment, fire protection devices, detection devices, electrical devices and other processing and scientific equipment.

**[DSA-AC]** *An area defined by equipment and/or work surfaces intended for use by employees only, and generally for one or a small number of employees at a time. Examples include ticket booths; the employee side of grocery store check stands; the bartender area behind a bar; the employee side of snack bars, sales counters and public counters; guardhouses; toll booths; kiosk vending stands; lifeguard stations; maintenance equipment closets; counter and equipment areas in restaurant kitchens; file rooms; storage areas; etc.*

**WORK AREA EQUIPMENT.** *[DSA-AC] Any machine, instrument, engine, motor, pump, conveyor, or other apparatus used to perform work. As used in this document, this term shall apply only to equipment that is permanently installed or built-in in employee work areas. Work area equipment does not include passenger elevators and other accessible means of vertical transportation.*

**WYTHE.** Each continuous, vertical section of a wall, one masonry unit in thickness.

**YARD.** An open space, other than a court, unobstructed from the ground to the sky, except where specifically provided by this code, on the lot on which a building is situated.

**[F] ZONE.** A defined area within the protected premises. A zone can define an area from which a signal can be received, an area to which a signal can be sent or an area in which a form of control can be executed.

**[F] ZONE, NOTIFICATION.** An area within a building or facility covered by notification appliances which are activated simultaneously.



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 3 – USE AND OCCUPANCY CLASSIFICATION

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below															X			X		
Chapter / Section																				
302.1			X																	
302.1.3																			X	
303.1			X																	
303.1.1			X																	
303.1.2			X																	
303.1.3			X																	
303.1.4			X																	
303.2			X																	
303.7			X	X	X															
303.8			X																	
304.1			X																	
304.2 Clinic, Outpatient			X																	
305.1 w/ Exception			X																	
305.2 w/ Exception			X																	
306.2			X																	
306.4-306.4.4			X																	
307.1			X																	
Table 307.1(1) Footnote d			X																	
Table 307.1(2) Footnote e			X																	
307.1.1			X																	
308.1			X																	
308.2 Detoxification facilities			X																	
308.2 Hospitals and Mental hospitals			X																	
308.2 Nursing Homes			X																	
308.3			X	X	X															
308.4			X										X	X		X				
308.4.1			X																	
308.5			X	X	X															
308.5.1			X																	
308.5.2			X																	
308.5.6			X																	
308.5.7			X																	
308.5.8			X																	
308.6			X																	
308.6.1			X																	
308.6.2.1			X																	
310.1			X	X	X															
310.2			X																	

*(continued)*

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 3 – USE AND OCCUPANCY CLASSIFICATION—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X					X	X	X	X											
Adopt entire chapter as amended (amended sections listed below)		X	X	X																
Adopt only those sections that are listed below													X			X				
<i>Chapter / Section</i>																				
310.3		X																		
310.4		X																		
310.4.1		X																		
310.5		X																		
310.5.1		X																		
310.6		X																		
313		X																		
313.1		X																		

*The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 1.11.*

# CHAPTER 3

## USE AND OCCUPANCY CLASSIFICATION

### SECTION 301 GENERAL

**301.1 Scope.** The provisions of this chapter shall control the classification of all buildings and structures as to use and occupancy.

### SECTION 302 CLASSIFICATION

**302.1 General.** Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed in this section. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied. Structures with multiple occupancies or uses shall comply with Section 508. Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved.

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5
2. Business (see Section 304): Group B
3. Educational (see Section 305): Group E
4. Factory and Industrial (see Section 306): Groups F-1 and F-2
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5
6. Institutional (see Section 308): Groups I-1, I-2, I-2.1, I-3 and I-4
7. *Laboratory (see Section 202): Group B, unless classified as Group L (see Section 443) or Group H (see Section 307).*
8. Mercantile (see Section 309): Group M
9. *[SFM] Organized Camps (see Section 440): Group C.*
10. *[SFM] Research Laboratories (see Section 443): Group L*
11. *Residential (see Section 310): Groups R-1, R-2, R-3 and R-4*
12. Storage (see Section 311): Groups S-1 and S-2
13. Utility and Miscellaneous (see Section 312): Group U

*[SFM] Existing buildings housing existing protective social care homes or facilities established prior to 1972 (see Section 3413).*

#### 302.1.1 Reserved

#### 302.1.2 Reserved

**302.1.3 Pharmacies; veterinary facilities; barbering, cosmetology or electrolysis establishments; and acupuncture offices.** See Chapter 12.

### SECTION 303 ASSEMBLY GROUP A

**303.1 Assembly Group A.** Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation; *motion picture and television production studio sound stages, approved production facilities and production locations; or for the showing of motion pictures when an admission fee is charged and when such building or structure is open to the public and has a capacity of 10 or more persons.*

**303.1.1 Small buildings and tenant spaces.** A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.

**303.1.2 Small assembly spaces.** The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
2. A room or space used for assembly purposes that is less than 750 square feet ( $70\text{ m}^2$ ) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

**303.1.3 Associated with Group E occupancies.** A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

**303.1.4 Accessory to places of religious worship.** Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

**303.2 Assembly Group A-1.** Assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

*Motion picture and television production studio sound stages, approved production facilities and production locations. (with live audiences).*

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience  
Theaters

**303.3 Assembly Group A-2.** Assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Nightclubs

Restaurants, cafeterias and similar dining facilities  
(including associated commercial kitchens)

Taverns and bars

**303.4 Assembly Group A-3.** Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades  
Art galleries  
Bowling alleys  
Community halls  
Courtrooms  
Dance halls (not including food or drink consumption)  
Exhibition halls  
Funeral parlors  
Gymnasiums (without spectator seating)  
Indoor swimming pools (without spectator seating)  
Indoor tennis courts (without spectator seating)  
Lecture halls  
Libraries  
Museums  
Places of religious worship  
Pool and billiard parlors  
Waiting areas in transportation terminals

**303.5 Assembly Group A-4.** Assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas  
Skating rinks  
Swimming pools  
Tennis courts

**303.6 Assembly Group A-5.** Assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures  
Bleachers  
Grandstands  
Stadiums

**303.7 Fixed guideway transit systems. [SFM]** Fixed guideway transit system buildings shall conform to the requirements of this code for their occupancy classification in addition to the provisions set forth in Section 433.

**303.8 Subterranean spaces for winery facilities in natural or manmade caves. [SFM]** For fire and life safety requirements, see Section 436.

## SECTION 304 BUSINESS GROUP B

**304.1 Business Group B.** Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers  
Ambulatory care facilities serving five or fewer patients (see Section 308.4.2 for facilities serving more than five patients)  
Animal hospitals, kennels and pounds  
Banks  
Barber and beauty shops

Car wash  
Civic administration  
Clinic, outpatient [SFM] (not classified as Group I-2.1)  
Dry cleaning and laundries: pick-up and delivery stations and self-service  
Educational occupancies for students above the 12th grade  
Electronic data processing  
Laboratories: testing, research and [SFM] instruction  
Motor vehicle showrooms  
Post offices  
Print shops  
Professional services (architects, attorneys, dentists, physicians, engineers, etc.)  
Radio and television stations  
Telephone exchanges  
Training and skill development not within a school or academic program (*this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics, and similar uses regardless of the ages served, and where not classified as a Group A occupancy*)

**304.2 Definitions.** The following terms are defined in Chapter 2:

**AMBULATORY CARE FACILITY.**

**CLINIC, OUTPATIENT.**

## SECTION 305 EDUCATIONAL GROUP E

**305.1 Educational Group E.** Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by more than six persons at any one time for educational purposes through the 12th grade.

**Exception:** [SFM] A residence used as a home school for the children who normally reside at the residence. Such residences shall remain classified as Group R-2, or Group R-3 occupancies.

**305.1.1 Accessory to places of religious worship.** Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 and have occupant loads of less than 100, shall be classified as Group A-3 occupancies.

**305.2 Group E, day care facilities.** This group includes buildings and structures or portions thereof occupied by more than six children 2 years of age and older who receive educational, supervision or personal care services for fewer than 24 hours per day.

**Exception:** [SFM] A Day-care facility not otherwise classified as an R-3 occupancy, where occupants are not capable of responding to an emergency situation without physical assistance from the staff shall be classified as Group I-4.

## SECTION 306 FACTORY GROUP F

**306.1 Factory Industrial Group F.** Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling,

fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

**306.2 Moderate-hazard factory industrial, Group F-1.** Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages: over 16-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment
- Canvas or similar fabric
- Carpets and rugs (includes cleaning)
- Clothing
- Construction and agricultural machinery
- Disinfectants
- Dry cleaning and dyeing
- Electric generation plants
- Electronics
- Engines (including rebuilding)
- Food processing and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities
- Furniture
- Hemp products
- Jute products
- Laundries
- Leather products
- Machinery
- Metals
- Millwork (sash and door)
- [SFM] Motion picture and television production studio  
Sound Stages, Approved Production Facilities and production locations (without live audiences)
- Musical instruments
- Optical goods
- Paper mills or products
- Photographic film
- Plastic products
- Printing or publishing
- Recreational vehicles
- Refuse incineration
- Shoes
- Soaps and detergents
- Textiles
- Tobacco
- Trailers
- Upholstering
- Wood; distillation
- Woodworking (cabinet)

**306.3 Low-hazard factory industrial, Group F-2.** Factory industrial uses that involve the fabrication or manufacturing

of noncombustible materials which during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

- Beverages: up to and including 16-percent alcohol content
- Brick and masonry
- Ceramic products
- Foundries
- Glass products
- Gypsum
- Ice
- Metal products (fabrication and assembly)

## SECTION 307 HIGH-HAZARD GROUP H

**[F] 307.1 High-hazard Group H.** High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414, based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *California Fire Code*. Hazardous materials stored, or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with the *California Fire Code*.

**Exceptions:** The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *California Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *California Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.

## USE AND OCCUPANCY CLASSIFICATION

8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the *California Mechanical Code*.
10. Corrosives shall not include personal or household products in their original packaging used in retail display or commonly used building materials.
11. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *California Fire Code*.
12. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
13. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *California Fire Code*.
14. [SFM] Group L occupancies as defined in section 443.1.

**[F] 307.1.1 Hazardous materials.** Hazardous materials in any quantity shall conform to the requirements of this code, including Section 414, and the *California Fire Code*.

**[F] 307.2 Definitions.** The following terms are defined in Chapter 2:

### AEROSOL.

Level 1 aerosol products.

Level 2 aerosol products.

Level 3 aerosol products.

### AEROSOL CONTAINER.

### BALED COTTON.

### BALED COTTON, DENSELY PACKED.

### BARRICADE.

Artificial barricade.

Natural barricade.

### BOILING POINT.

### CLOSED SYSTEM.

### COMBUSTIBLE DUST.

### COMBUSTIBLE FIBERS.

### COMBUSTIBLE LIQUID.

Class II.

Class IIIA.

Class IIIB.

### COMPRESSED GAS.

### CONTROL AREA.

### CORROSIVE.

### CRYOGENIC FLUID.

### DAY BOX.

### DEFLAGRATION.

### DETONATION.

### DISPENSING.

### EXPLOSION.

### EXPLOSIVE.

High explosive.

Low explosive.

Mass-detonating explosives.

UN/DOTn Class 1 explosives.

Division 1.1.

Division 1.2.

Division 1.3.

Division 1.4.

Division 1.5.

Division 1.6.

### FIREWORKS.

Fireworks, 1.3G.

Fireworks, 1.4G.

### FLAMMABLE GAS.

### FLAMMABLE LIQUEFIED GAS.

### FLAMMABLE LIQUID.

Class IA.

Class IB.

Class IC.

### FLAMMABLE MATERIAL.

### FLAMMABLE SOLID.

### FLASH POINT.

### HANDLING.

### HAZARDOUS MATERIALS.

### HEALTH HAZARD.

### HIGHLY TOXIC.

### INCOMPATIBLE MATERIALS.

### INERT GAS.

### OPEN SYSTEM.

### OPERATING BUILDING.

### ORGANIC PEROXIDE.

Class I.

Class II.

Class III.

**Class IV.****Class V.****Unclassified detonable.****OXIDIZER.****Class 4.****Class 3.****Class 2.****Class 1.****OXIDIZING GAS.****PHYSICAL HAZARD.****PYROPHORIC.****PYROTECHNIC COMPOSITION.****TOXIC.****UNSTABLE (REACTIVE) MATERIAL.****Class 4.****Class 3.****Class 2.****Class 1.****WATER-REACTIVE MATERIAL.****Class 3.****Class 2.****Class 1.**

**[F] 307.3 High-hazard Group H-1.** Buildings and structures containing materials that pose a detonation hazard shall be classified as Group H-1. Such materials shall include, but not be limited to, the following:

Detonable pyrophoric materials

Explosives:

Division 1.1

Division 1.2

Division 1.3

**[F] TABLE 307.1(1)**  
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, j, m, n, p</sup>**

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE <sup>b</sup>			USE-CLOSED SYSTEMS <sup>b</sup>			USE-OPEN SYSTEMS <sup>b</sup>	
			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	N/A	H-2	Note q	N/A	N/A	Note q	N/A	N/A	Note q	N/A
Combustible liquid <sup>c, i</sup>	II IIIA IIB	H-2 or H-3 H-2 or H-3 N/A	N/A	120 <sup>d, e</sup> 330 <sup>d, e</sup> 13,200 <sup>e, f</sup>	N/A	N/A	120 <sup>d</sup> 330 <sup>d</sup> 13,200 <sup>f</sup>	N/A	N/A	30 <sup>d</sup> 80 <sup>d</sup> 3,300 <sup>f</sup>
Combustible fiber	Loose Baled <sup>o</sup>	H-3	(100) (1,000)	N/A	N/A	(100) (1,000)	N/A	N/A	(20) (200)	N/A
Consumer fireworks	1.4G	H-3	125 <sup>d, e, l</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cryogenics, flammable	N/A	H-2	N/A	45 <sup>d</sup>	N/A	N/A	45 <sup>d</sup>	N/A	N/A	10 <sup>d</sup>
Cryogenics, inert	N/A	N/A	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A
Cryogenics, oxidizing	N/A	H-3	N/A	45 <sup>d</sup>	N/A	N/A	45 <sup>d</sup>	N/A	N/A	10 <sup>d</sup>
Explosives	Division 1.1	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.2	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.3	H-1 or H-2	5 <sup>e, g</sup>	(5) <sup>e, g</sup>	N/A	1 <sup>g</sup>	(1) <sup>g</sup>	N/A	1 <sup>g</sup>	(1) <sup>g</sup>
	Division 1.4	H-3	50 <sup>e, g</sup>	(50) <sup>e, g</sup>	N/A	50 <sup>g</sup>	(50) <sup>g</sup>	N/A	N/A	N/A
	Division 1.4G	H-3	125 <sup>d, e, l</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Division 1.5	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	N/A	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.6	H-1	1 <sup>d, e, g</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flammable gas	Gaseous Liquefied	H-2	N/A	N/A (150) <sup>d, e</sup>	1,000 <sup>d, e</sup> N/A	N/A	N/A (150) <sup>d, e</sup>	1,000 <sup>d, e</sup> N/A	N/A	N/A
Flammable liquid <sup>c</sup>	1A 1B and 1C	H-2 or H-3	N/A	30 <sup>d, e</sup> 120 <sup>d, e</sup>	N/A	N/A	30 <sup>d</sup> 120 <sup>d</sup>	N/A	N/A	10 <sup>d</sup> 30 <sup>d</sup>
Flammable liquid, combination (1A, 1B, 1C)	N/A	H-2 or H-3	N/A	120 <sup>d, e, h</sup>	N/A	N/A	120 <sup>d, h</sup>	N/A	N/A	30 <sup>d, h</sup>

(continued)

**USE AND OCCUPANCY CLASSIFICATION**

**[F] TABLE 307.1(1)—(continued)**  
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, b, m, n, p</sup>**

<b>MATERIAL</b>	<b>CLASS</b>	<b>GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED</b>	<b>STORAGE<sup>b</sup></b>			<b>USE-CLOSED SYSTEMS<sup>b</sup></b>			<b>USE-OPEN SYSTEMS<sup>b</sup></b>	
			<b>Solid pounds (cubic feet)</b>	<b>Liquid gallons (pounds)</b>	<b>Gas (cubic feet at NTP)</b>	<b>Solid pounds (cubic feet)</b>	<b>Liquid gallons (pounds)</b>	<b>Gas (cubic feet at NTP)</b>	<b>Solid pounds (cubic feet)</b>	<b>Liquid gallons (pounds)</b>
Flammable solid	N/A	H-3	125 <sup>d, e</sup>	N/A	N/A	125 <sup>d</sup>	N/A	N/A	25 <sup>d</sup>	N/A
Inert gas	Gaseous Liquefied	N/A N/A	N/A N/A	N/A N/A	NL	N/A N/A	N/A N/A	NL NL	N/A N/A	N/A N/A
Organic peroxide	UD I II III IV V	H-1 H-2 H-3 H-3 N/A N/A	1 <sup>e, g</sup> 5 <sup>d, e</sup> 50 <sup>d, e</sup> 125 <sup>d, e</sup> NL NL	(1) <sup>e, g</sup> (5) <sup>d, e</sup> (50) <sup>d, e</sup> (125) <sup>d, e</sup> NL NL	N/A N/A N/A N/A N/A N/A	0.25 <sup>g</sup> 1 <sup>d</sup> 50 <sup>d</sup> 125 <sup>d</sup> NL NL	(0.25) <sup>g</sup> (1) <sup>d</sup> (50) <sup>d</sup> (125) <sup>d</sup> N/A N/A	N/A N/A N/A N/A N/A N/A	0.25 <sup>g</sup> 1 <sup>d</sup> 10 <sup>d</sup> 25 <sup>d</sup> NL NL	(0.25) <sup>g</sup> (1) <sup>d</sup> (10) <sup>d</sup> (25) <sup>d</sup> NL NL
Oxidizer	4 3 <sup>k</sup> 2 1	H-1 H-2 or H-3 H-3 N/A	1 <sup>e, g</sup> 10 <sup>d, e</sup> 250 <sup>d, e</sup> 4,000 <sup>e, f</sup>	(1) <sup>e, g</sup> (10) <sup>d, e</sup> (250) <sup>d, e</sup> (4,000) <sup>e, f</sup>	N/A N/A N/A N/A	0.25 <sup>g</sup> 2 <sup>d</sup> 250 <sup>d</sup> 4,000 <sup>f</sup>	(0.25) <sup>g</sup> (2) <sup>d</sup> (250) <sup>d</sup> (4,000) <sup>f</sup>	N/A N/A N/A N/A	0.25 <sup>g</sup> 2 <sup>d</sup> 50 <sup>d</sup> 1,000 <sup>f</sup>	(0.25) <sup>g</sup> (2) <sup>d</sup> (50) <sup>d</sup> (1,000) <sup>f</sup>
Oxidizing gas	Gaseous Liquefied	H-3	N/A N/A	N/A (150) <sup>d, e</sup>	1,500 <sup>d, e</sup> N/A	N/A N/A	N/A (150) <sup>d, e</sup>	1,500 <sup>d, e</sup> N/A	N/A N/A	N/A N/A
Pyrophoric material	N/A	H-2	4 <sup>e, g</sup>	(4) <sup>e, g</sup>	50 <sup>e, g</sup>	1 <sup>g</sup>	(1) <sup>g</sup>	10 <sup>g</sup>	0	0
Unstable (reactive)	4 3 2 1	H-1 H-1 or H-2 H-3 N/A	1 <sup>e, g</sup> 5 <sup>d, e</sup> 50 <sup>d, e</sup> NL	(1) <sup>e, g</sup> (5) <sup>d, e</sup> (50) <sup>d, e</sup> NL	10 <sup>g</sup> 50 <sup>d, e</sup> 250 <sup>d, e</sup> NL	0.25 <sup>g</sup> 1 <sup>d</sup> 50 <sup>d</sup> NL	(0.25) <sup>g</sup> (1) <sup>d</sup> (50) <sup>d</sup> NL	2 <sup>e, g</sup> 10 <sup>d, e</sup> 250 <sup>d, e</sup> NL	0.25 <sup>g</sup> 1 <sup>d</sup> 10 <sup>d</sup> NL	(0.25) <sup>g</sup> (1) <sup>d</sup> (10) <sup>d</sup> NL
Water reactive	3 2 1	H-2 H-3 N/A	5 <sup>d, e</sup> 50 <sup>d, e</sup> NL	(5) <sup>d, e</sup> (50) <sup>d, e</sup> NL	N/A N/A N/A	5 <sup>d</sup> 50 <sup>d</sup> NL	(5) <sup>d</sup> (50) <sup>d</sup> NL	N/A N/A N/A	1 <sup>d</sup> 10 <sup>d</sup> NL	(1) <sup>d</sup> (10) <sup>d</sup> NL

For SI: 1 cubic foot = 0.028 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NL = Not Limited; N/A = 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, consumer or industrial 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. [SFM] In other than Group L occupancies, 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. [SFM] In other than Group L occupancies, maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the *California Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.
- f. The permitted quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- g. Permitted 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 *California Fire Code*.
- j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
- k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment. Storage containers and the manner of storage shall be 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 *California 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 this code.
  - 3. Gaseous fuels in piping systems and fixed appliances regulated by the *California Fuel Gas Code*.
  - 4. Liquid fuels in piping systems and fixed appliances regulated by the *California Mechanical Code*.
- 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.

**[F] TABLE 307.1(2)**  
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL POSING A HEALTH HAZARD<sup>a, b, c, i</sup>**

<b>MATERIAL</b>	<b>STORAGE<sup>d</sup></b>			<b>USE-CLOSED SYSTEMS<sup>d</sup></b>			<b>USE-OPEN SYSTEMS<sup>d</sup></b>	
	<b>Solid pounds (cubic feet)</b>	<b>Liquid gallons (pounds)<sup>e,f</sup></b>	<b>Gas (cubic feet at NTP)<sup>e</sup></b>	<b>Solid pounds<sup>e</sup></b>	<b>Liquid gallons (pounds)<sup>e</sup></b>	<b>Gas (cubic feet at NTP)<sup>e</sup></b>	<b>Solid pounds<sup>e</sup></b>	<b>Liquid gallons (pounds)<sup>e</sup></b>
Corrosive	5,000	500	Gaseous 810 <sup>f</sup> Liquefied (150) <sup>h</sup>	5,000	500	Gaseous 810 <sup>f</sup> Liquefied (150) <sup>h</sup>	1,000	100
Highly toxic	10	(10) <sup>h</sup>	Gaseous 20 <sup>g</sup> Liquefied (4) <sup>g,h</sup>	10	(10) <sup>i</sup>	Gaseous 20 <sup>g</sup> Liquefied (4) <sup>g,h</sup>	3	(3) <sup>i</sup>
Toxic	500	(500) <sup>h</sup>	Gaseous 810 <sup>f</sup> Liquefied (150) <sup>f,h</sup>	500	(500) <sup>i</sup>	Gaseous 810 <sup>f</sup> Liquefied (150) <sup>f,h</sup>	125	(125)

For SI: 1 cubic foot = 0.028 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

- a. For use of control areas, see Section 414.2.
- b. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs, consumer or industrial 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.
- c. 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).
- d. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
- e. 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 f also applies, the increase for both notes shall be applied accumulatively.
- f. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *California Fire Code*. Where Note e also applies, the increase for both notes shall be applied accumulatively.
- g. Allowed only when stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *California 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 *California Fire Code*.

Division 1.4  
Division 1.5  
Division 1.6

Organic peroxides, unclassified detonable  
Oxidizers, Class 4  
Unstable (reactive) materials, Class 3 detonable and Class 4

**[F] 307.3.1 Occupancies containing explosives not classified as H-1.** The following occupancies containing explosive materials shall be classified as follows:

1. Division 1.3 explosive materials that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in H-2 occupancies.
2. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles shall be allowed in H-3 occupancies.

**[F] 307.4 High-hazard Group H-2.** Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids which are used or stored in normally open containers or sys-

tems, or in closed containers or systems pressurized at more than 15 psi (103.4 kPa) gage

Combustible dusts 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

Cryogenic fluids, flammable

Flammable gases

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 psi (103 kPa) gage

Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable

Water-reactive materials, Class 3

**[F] 307.5 High-hazard Group H-3.** Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less

Combustible fibers, other than densely packed baled cotton

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

**[F] 307.6 High-hazard Group H-4.** Buildings and structures which contain materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

**[F] 307.7 High-hazard Group H-5.** Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those listed in Tables 307.1(1) and 307.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.10.

**[F] 307.8 Multiple hazards.** Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

## SECTION 308 INSTITUTIONAL GROUP I

**308.1 Institutional Group I.** Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-2.1, I-3 or I-4. *Restraint shall not be permitted in any building except in Group I-3 occupancies constructed for such use, see Section 408.1.1.*

*Where occupancies house both ambulatory and nonambulatory persons, the more restrictive requirements shall apply.*

**308.2 Definitions.** The following terms are defined in Chapter 2:

**24-HOUR CARE.**

**CUSTODIAL CARE.**

**DETOXIFICATION FACILITIES.**

**FOSTER CARE FACILITIES.**

**HOSPITALS AND PSYCHIATRIC HOSPITALS.**

**INCAPABLE OF SELF-PRESERVATION.**

**MEDICAL CARE.**

**NURSING HOMES.**

**308.3 Institutional Group I-1. Not used. (See Group R-2.1 Section 310.1)**

**308.4 Institutional Group I-2.** This occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation *or classified as nonambulatory or bedridden.* This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

**308.4.1 Institutional Group I-2.1 Ambulatory health care facility.** A healthcare facility that receives persons for outpatient medical care that may render the patient incapable of unassisted self-preservation and where each tenant space accommodates more than five such patients.

**308.5 Institutional Group I-3.** This occupancy shall include buildings and structures that are inhabited by *one or more* persons who are under restraint or security. An I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control, *which includes persons restrained.* This group shall include, but not be limited to, the following:

Correctional centers

*Courthouse holding facility*

Detention centers

*Detention treatment room*

Jails

Prerelease centers

Prisons

Reformatories

*Secure interview rooms*

*Temporary holding facility*

Buildings of Group I-3 shall be classified as one of the occupancy conditions indicated in Sections 308.5.1 through 308.5.8 (see Section 408.1).

**308.5.1 Condition 1.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas, and other spaces where access or occupancy is permitted, to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

**308.5.2 Condition 2.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

**308.5.3 Condition 3.** This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such a smoke compartment to another smoke compartment.

**308.5.4 Condition 4.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity

spaces and other occupied areas within the smoke compartment to other smoke compartments.

**308.5.5 Condition 5.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

**308.5.6 Condition 6.** This occupancy condition shall include buildings containing only one temporary holding facility with five or less persons under restraint or security where the building is protected throughout with a monitored automatic sprinkler system installed in accordance with Section 903.3.1.1 and where the temporary holding facility is protected throughout with an automatic fire alarm system with notification appliances. A Condition 6 building shall be permitted to be classified as a Group B occupancy.

**308.5.7 Condition 7.** This occupancy condition shall include buildings containing only one temporary holding facility with nine or less persons under restraint or security where limited to the first or second story, provided the building complies with Section 408.1.2.6. A Condition 7 building shall be permitted to be classified as a Group B occupancy.

**308.5.8 Condition 8.** This occupancy condition shall include buildings containing not more than four secure interview rooms located within the same fire area where not more than six occupants under restraint are located in the same fire area. A Condition 8 building shall be is permitted to be classified as a Group B occupancy, provided the requirements in Section 408.1.2.7 are met.

**308.6 Institutional Group I-4, day care facilities.** This group shall include buildings and structures occupied by more than six *clients* of any age who receive custodial care for fewer than 24 hours per day by persons other than parents or guardians, relatives by blood, marriage or adoption, and in a place other than the home of the *clients* cared for. This group shall include, but not be limited to, the following:

Adult day care  
Child day care

**308.6.1 Classification as Group E.** A child day care facility that provides care for more than six but no more than 100 children *under 2 years of age*, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

**308.6.1.1 Special provisions.** See Section 442.4 for daycares located above or below the first story.

## SECTION 309 MERCANTILE GROUP M

**309.1 Mercantile Group M.** Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise and

involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Markets
- Motor fuel-dispensing facilities
- Retail or wholesale stores
- Sales rooms

**309.2 Quantity of hazardous materials.** The aggregate quantity of nonflammable solid and nonflammable or non-combustible liquid hazardous materials stored or displayed in a single control area of a Group M occupancy shall not exceed the quantities in Table 414.2.5(1).

## SECTION 310 RESIDENTIAL GROUP R

**310.1 Residential Group R.** Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *California Residential Code*.

**310.2 Definitions.** The following terms are defined in Chapter 2:

- AGED HOME OR INSTITUTION.**
- BEDRIDDEN PERSON.**
- BOARDING HOUSE.**
- CARE AND SUPERVISION.**
- CATASTROPHICALLY INJURED.**
- CHILD-CARE CENTER.**
- CHILD OR CHILDREN.**
- CHRONICALLY ILL.**
- CONGREGATE LIVING HEALTH FACILITY (CLHF).**
- CONGREGATE RESIDENCE.**
- DAY CARE.**
- DAY-CARE HOME, FAMILY.**
- DAY-CARE HOME, LARGE FAMILY.**
- DAY-CARE HOME, SMALL FAMILY.**
- DORMITORY.**
- FULL-TIME CARE.**
- GROUP HOME.**
- INFANT.**
- MENTALLY RETARDED PERSONS, PROFOUNDLY OR SEVERELY.**
- NONAMBULATORY PERSONS.**
- RESIDENTIAL CARE FACILITY FOR THE CHRONICALLY ILL (RCF/CI).**
- RESIDENTIAL CARE FACILITY FOR THE ELDERLY (RCFE).**
- RESIDENTIAL FACILITY (RF).**
- TERMINALLY ILL.**
- TRANSIENT.**

**310.3 Residential Group R-1.** Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

## USE AND OCCUPANCY CLASSIFICATION

Boarding houses (transient) with more than 10 occupants  
*Congregate residents* (transient) with more than 10 occupants  
Hotels (transient)  
Motels (transient)

### [HCD 1] Efficiency dwelling units (transient)

**310.4 Residential Group R-2.** Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses  
Boarding houses (nontransient) with more than 16 occupants  
*Congregate residences* (nontransient) with more than 16 occupants  
Convents  
Dormitories  
Fraternities and sororities  
Hotels (nontransient)  
Live/work units  
Monasteries  
Motels (nontransient)  
Vacation timeshare properties

### [HCD 1] Efficiency dwelling units (nontransient)

**310.4.1 Residential Group R-2.1** This occupancy shall include buildings, structures or parts thereof housing clients, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services.

This occupancy may contain more than six nonambulatory and/or bedridden clients. (See Section 425 Special Provisions for Licensed 24-Hour Care Facilities in a Group R-2.1, R-3.1 or R-4 Occupancy). This group shall include, but not be limited to, the following:

Assisted living facilities such as:

Residential care facilities,  
Residential care facilities for the elderly (RCFEs),  
Adult residential facilities,  
*Congregate living health facilities*,  
Group homes,  
Residential care facilities for the chronically ill,  
*Congregate living health facilities for the terminally ill*.

Social rehabilitation facilities such as:

Halfway houses,  
Community correctional centers,  
Community correction reentry centers,  
Community treatment programs,  
Work furlough programs,  
Alcoholism or drug abuse recovery or treatment facilities.

**310.5 Residential Group R-3.** Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-2.1, R-3.1, R-4 or I, including:

Buildings that do not contain more than two dwelling units  
Boarding houses (nontransient) with 16 or fewer

occupants

Boarding houses (transient) with 10 or fewer occupants  
Adult care facilities that provide accommodations for six or fewer clients of any age for less than 24 hours. Licensing categories that may use this classification include, but are not limited to:

Adult Day Programs.

Child care facilities that provide accommodations for six or fewer clients of any age for less than 24 hours.

Licensing categories that may use this classification include, but are not limited to:

*Day-Care Center for Mildly Ill Children*,  
*Infant Care Center*,  
*School Age Child Day-Care Center*.

*Congregate residences* (nontransient) with 16 or fewer occupants

*Congregate residences* (transient) with 10 or fewer occupants

### [HCD 1] Efficiency dwelling units

*Family Day-Care Homes* that provide accommodations for 14 or fewer children, in the provider's own home for less than 24-hours.

Alcoholism or drug abuse recovery homes  
(ambulatory only)

Foster family homes (ambulatory only)

Adult care and child care facilities that are within a single family home are permitted to comply with the California Residential Code.

**310.5.1 Residential Group R-3.1** This occupancy group may include facilities licensed by a governmental agency for a residentially based 24-hour care facility providing accommodations for six or fewer clients of any age. Clients may be classified as ambulatory, nonambulatory or bedridden. A Group R-3.1 occupancy shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in Section 425 Special Provisions For Licensed 24-Hour Care Facilities in a Group R-2.1, R-3.1 or R-4 Occupancy. This group may include:

Adult residential facilities  
*Congregate living health facilities*  
Foster family homes  
Group homes

Intermediate care facilities for the developmentally disabled habilitative

Intermediate care facilities for the developmentally disabled nursing

Nurseries for the full-time care of children under the age of six, but not including "infants" as defined in Section 310

Residential care facilities for the elderly

Small family homes and residential care facilities for the chronically ill

*Exception:* Group Homes licensed by the Department of Social Services which provide nonmedical board, room and care for six or fewer ambulatory children or

*children two years of age or younger, and which do not have any nonambulatory clients shall not be subject to regulations found in Section 425.*

*Pursuant to Health and Safety Code Section 13143 with respect to these exempted facilities, no city, county or public district shall adopt or enforce any requirement for the prevention of fire or for the protection of life and property against fire and panic unless the requirement would be applicable to a structure regardless of the special occupancy. Nothing shall restrict the application of state or local housing standards to such facilities if the standards are applicable to residential occupancies and are not based on the use of the structure as a facility for ambulatory children. For the purpose of this exception, ambulatory children does not include relatives of the licensee or the licensee's spouse.*

**310.6 Residential Group R-4.** This occupancy shall include buildings, structures or portions thereof for more than six ambulatory clients, but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. The persons receiving care are capable of self-preservation. This group shall include, but not be limited to, the following:

*This occupancy classification may include a maximum six nonambulatory or bedridden clients (see Section 425 Special Provisions for Licensed 24-Hour Care Facilities in a Group R-2.1, R-3.1 or R-4 Occupancy). Group R-4 occupancies shall include the following:*

*Assisted living facilities such as:*

*Residential care facilities,  
Residential care facilities for the elderly (RCFE),  
Adult residential facilities,  
Congregate living health facilities,  
Group homes.*

*Social rehabilitation facilities such as:*

*Halfway houses,  
Community correctional centers,  
Community correction reentry centers,  
Community treatment programs,  
Work furlough programs,  
Alcoholism or drug abuse recovery or treatment facilities.*

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

**310.7 Large Family Day-Care Homes.** See Section 445.

## SECTION 311 STORAGE GROUP S

**311.1 Storage Group S.** Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

**311.2 Moderate-hazard storage, Group S-1.** Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber
Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)
Photo engravings
Resilient flooring
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles
<b>311.3 Low-hazard storage, Group S-2.</b> Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:
Asbestos
Beverages up to and including 16-percent alcohol in metal, glass or ceramic containers
Cement in bags
Chalk and crayons
Dairy products in nonwaxed coated paper containers
Dry cell batteries
Electrical coils
Electrical motors
Empty cans
Food products
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glass bottles, empty or filled with noncombustible liquids
Gypsum board
Inert pigments

## USE AND OCCUPANCY CLASSIFICATION

Ivory  
Meats  
Metal cabinets  
Metal desks with plastic tops and trim  
Metal parts  
Metals  
Mirrors  
Oil-filled and other types of distribution transformers  
Parking garages, open or enclosed  
Porcelain and pottery  
Stoves  
Talc and soapstones  
Washers and dryers

### SECTION 312 UTILITY AND MISCELLANEOUS GROUP U

**312.1 General.** Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings  
Aircraft hangars, accessory to a one- or two-family residence (see Section 412.5)  
Barns  
Carports  
Fences more than 6 feet (1829 mm) in height  
Grain silos, accessory to a residential occupancy  
Greenhouses  
Livestock shelters  
Private garages  
Retaining walls  
Sheds  
Stables  
Tanks  
Towers

### SECTION 313 LABORATORIES GROUP L [SFM]

**313.1 Laboratories Group L. [SFM]** Group L occupancy includes the use of a building or structure, or a portion thereof, containing one or more laboratory suites as defined in Section 443.

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS ON USE AND OCCUPANCY**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
<i>Adopt entire chapter</i>	X					X	X	X	X	X										
<i>Adopt entire chapter as amended (amended sections listed below)</i>			X	X	X															
<i>Adopt only those sections that are listed below</i>						X	X									X		X		
<i>Chapter / Section</i>																				
403			X																	
403.1			X																	
403.1.1			X																	
403.2			X																	
403.2.1			X																	
403.2.1.1			X																	
403.3			X																	
403.3.1			X																	
403.3.2			X																	
403.3.2.1			X																	
403.3.4			X																	
403.4.4			X																	
403.4.6			X																	
403.4.6.1			X																	
403.4.7			X																	
403.4.7.1			X																	
403.4.8.1			X																	
403.5.3			X																	
403.5.4			X																	
403.6			X																	
403.7			X																	
404.2			X																	
404.6			X																	
404.10			X																	
406.3.5				X	X															
406.4.1				X	X	X	X													
406.6.2			X																	
406.9			X																	
406.9.1			X																	
406.9.2			X																	
406.9.3			X																	
406.9.4			X																	
407.1			X																	
407.2			X																	
407.2.1			X																	
407.2.2			X																	
407.3			X																	
407.3.1			X																	
407.3.1.1			X																	
407.3.2			X																	
407.4			X																	
407.4.1			X																	
407.4.1.2			X																	
407.4.2			X																	
407.4.2			X																	
407.4.3.2			X																	

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS ON USE AND OCCUPANCY—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)		X	X	X																
Adopt only those sections that are listed below						X								X			X			
Chapter / Section																				
407.5		X																		
407.5.2		X																		
407.6		X																		
407.6.1		X																		
407.8		X																		
407.9		X																		
407.10		X																		
407.11		X																		
407.11.1		X																		
407.11.2		X																		
407.11.3		X																		
407.11.4		X																		
408.1.1		X																		
408.1.2		X																		
408.1.2.1		X																		
408.1.2.2		X																		
408.1.2.3		X																		
408.1.2.4		X																		
408.1.2.5		X																		
408.1.2.6		X																		
408.1.2.7		X																		
408.2		X																		
408.2.1		X																		
408.3.1.1		X																		
408.3.6		X																		
408.3.6.1		X																		
408.3.6.2		X																		
408.3.6.4		X																		
408.3.6.5		X																		
408.3.8		X																		
408.3.8.1		X																		
408.3.8.2		X																		
408.3.9		X																		
408.3.10		X																		
408.3.11		X																		
408.4		X																		
408.4.3		X																		
408.5.1		X																		
408.6		X																		
408.6.1		X																		
408.8		X																		
408.8.1		X																		
408.9		X																		
408.9.1		X																		

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS ON USE AND OCCUPANCY—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X								X			X			
Chapter / Section																				
408.12			X																	
408.13			X																	
408.14			X																	
408.15			X																	
408.15.1			X																	
408.15.2			X																	
408.15.3			X																	
408.15.3.1			X																	
408.15.3.2			X																	
408.15.4			X																	
408.15.5			X																	
409.3			X																	
412.3.5						X														
412.6.6			X																	
414.1.1			X																	
414.1.2			X																	
414.1.2.1			X																	
414.2			X																	
414.3			X																	
414.5			X																	
Table 414.5.1			X																	
414.5.5			X																	
415.1			X																	
415.5			X																	
415.5.1			X																	
Table 415.5.2			X																	
415.8			X																	
415.8.1			X																	
415.8.1.4			X																	
415.8.2			X																	
415.8.2.3			X																	
415.8.2.4			X																	
415.8.2.6			X																	
415.8.2.7			X																	
415.8.2.8			X																	
415.8.3			X																	
415.8.4			X																	
415.9			X																	
415.10			X																	
415.10.1.7			X																	
415.10.4			X																	

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS ON USE AND OCCUPANCY—continued**

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter	X						X	X	X	X		X							
Adopt entire chapter as amended (amended sections listed below)		X	X	X															
Adopt only those sections that are listed below						X								X		X			
Chapter / Section																			
415.10.7.2		X																	
415.10.9.3		X																	
415.10.10.1		X																	
415.10.11		X																	
415.11		X																	
415.11.1		X																	
415.11.1.1		X																	
415.11.1.2		X																	
415.11.1.3		X																	
415.11.1.4		X																	
415.11.1.5		X																	
415.12		X																	
415.12.1		X																	
415.12.2		X																	
415.12.3		X																	
416.1		X																	
416.3		X																	
416.4		X																	
419.7		X			X														
419.9		X	X	X	X														
420.1		X																	
420.6		X	X	X	X														
420.6.1		X	X	X	X														
420.6.1.1		X	X	X	X														
420.6.1.2		X	X	X	X														
420.6.1.3		X	X	X	X														
420.6.1.4		X	X	X	X														
420.6.1.5		X	X	X	X														
420.6.1.6		X	X	X	X														
420.6.2		X	X	X	X														
420.6.2.1		X	X	X	X														
420.6.2.2		X	X	X	X														
420.6.2.3		X	X	X	X														
420.6.2.3.1		X	X	X	X														
420.6.2.3.2		X	X	X	X														
420.6.2.3.3			X	X	X														
420.6.2.4		X	X	X	X														
420.6.2.5		X	X	X	X														
420.6.2.6		X	X	X	X														
420.7		X	X	X	X														
420.8		X	X		X														
420.8.1		X	X	X	X														

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 4 – SPECIAL DETAILED REQUIREMENTS ON USE AND OCCUPANCY—continued**

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			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X										
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X	X									X		X		
<i>Chapter / Section</i>																				
420.9			X																	
420.10			X																	
421			X																	
421.1			X																	
421.2			X																	
421.3			X																	
421.4			X																	
421.4.1			X																	
421.5			X																	
421.6			X																	
421.6.2			X																	
421.6.3			X																	
421.6.4			X																	
421.7			X																	
425			X																	
426			X																	
429			X																	
430			X																	
431			X																	
432			X																	
433			X																	
434			X																	
436			X																	
439			X															X		
440			X														X			
442			X																	
443			X																	
445			X																	



# CHAPTER 4

## SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

### SECTION 401 SCOPE

**401.1 Detailed use and occupancy requirements.** In addition to the occupancy and construction requirements in this code, the provisions of this chapter apply to the special uses and occupancies described herein.

### SECTION 402 COVERED MALL AND OPEN MALL BUILDINGS

*Section 402 has been completely reorganized from the 2009 code; therefore, the \* and \*\* margin indicators have not been included for clarity.*

**402.1 Applicability.** The provisions of this section shall apply to buildings or structures defined herein as covered or open mall buildings not exceeding three floor levels at any point nor more than three stories above grade plane. Except as specifically required by this section, covered and open mall buildings shall meet applicable provisions of this code.

#### Exceptions:

1. Foyers and lobbies of Groups B, R-1 and R-2 are not required to comply with this section.
2. Buildings need not comply with the provisions of this section where they totally comply with other applicable provisions of this code.

**402.1.1 Open space.** A covered mall building and attached anchor buildings and parking garages shall be surrounded on all sides by a permanent open space or not less than 60 feet (18 288 mm). An open mall building and anchor buildings and parking garages adjoining the perimeter line shall be surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm).

**Exception:** The permanent open space of 60 feet (18 288 mm) shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the covered or open mall building and anchor buildings;
2. The exterior wall facing the reduced open space shall have a fire-resistance rating of not less than 3 hours;
3. Openings in the exterior wall facing the reduced open space shall have opening protectives with a fire protection rating of not less than 3 hours; and
4. Group E, H, I or R occupancies are not located within the covered or open mall building or anchor buildings.

**402.1.2 Open mall building perimeter line.** For the purpose of this code, a perimeter line shall be established. The perimeter line shall encircle all buildings and structures which comprise the open mall building and shall encompass any open-air interior walkways, open-air courtyards or similar open-air spaces. The perimeter line shall define the extent of the open mall building. Anchor buildings and parking structures shall be outside of the perimeter line and are not considered as part of the open mall building.

**402.2 Definitions.** The following terms are defined in Chapter 2:

#### ANCHOR BUILDING.

#### COVERED MALL BUILDING.

Mall.

Open mall.

Open mall building.

#### FOOD COURT.

#### GROSS LEASABLE AREA.

**402.3 Lease plan.** Each owner of a covered mall building or of an open mall building shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the building official.

**402.4 Construction.** The construction of covered and open mall buildings, anchor buildings and parking garages associated with a mall building shall comply with Sections 402.4.1 through 402.4.3.

**402.4.1 Area and types of construction.** The building area of any covered mall or open building, including anchor buildings, of Types I, II, III and IV construction shall not be limited provided the anchor buildings do not exceed three stories above grade plane.

The construction type of open parking garages and enclosed parking garages shall comply with Sections 406.5 and 406.6, respectively.

**Exception:** The type of construction allowable building height and building area of anchor buildings greater than three stories above grade plane shall comply with Section 503, as modified by Sections 504 and 506.

**402.4.2 Fire-resistance-rated separation.** Fire-resistance-rated separation is not required between tenant spaces and the mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces or the mall.

**402.4.2.1 Tenant separations.** Each tenant space shall be separated from other tenant spaces by a fire partition complying with Section 708. A tenant separation wall is not required between any tenant space and the mall.

**402.4.2.2 Anchor building separation.** An anchor building shall be separated from the covered or open mall building by fire walls complying with Section 706.

**Exceptions:**

1. Anchor buildings of not more than three stories above grade plane that have an occupancy classification the same as that permitted for tenants of the mall building shall be separated by 2-hour fire-resistance-rated fire barriers complying with Section 707.
2. The exterior walls of anchor buildings separated from an open mall building by an open mall shall comply with Table 602.

**402.4.2.2.1 Openings between anchor building and mall.** Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Type IA, IB, IIA or IIB construction and the mall need not be protected.

**402.4.2.3 Parking garages.** An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as a separate building where it is separated from the covered or open mall building or anchor building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

Parking garages, open or enclosed, which are separated from covered mall buildings, open mall buildings or anchor buildings shall comply with the provisions of Table 602.

Pedestrian walkways and tunnels which connect garages to mall buildings or anchor buildings shall be constructed in accordance with Section 3104.

**402.4.3 Open mall construction.** Floor assemblies in, and roof assemblies over, the open mall of an open mall building shall be open to the atmosphere for not less than 20 feet (9096 mm), measured perpendicular from the face of the tenant spaces on the lowest level, from edge of balcony to edge of balcony on upper floors and from edge of roof line to edge of roof line. The openings within, or the unroofed area of, an open mall shall extend from the lowest/grade level of the open mall through the entire roof assembly. Balconies on upper levels of the mall shall not project into the required width of the opening.

**402.4.3.1 Pedestrian walkways.** Pedestrian walkways connecting balconies in an open mall shall be located not less than 20 feet (9096 mm) from any other pedestrian walkway.

**[F] 402.5 Automatic sprinkler system.** Covered and open mall buildings and buildings connected shall be protected

throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, which shall comply with all of the following:

1. The automatic sprinkler system shall be complete and operative throughout occupied space in the mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternative protection.
2. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces or anchor buildings.
3. Sprinkler protection for the tenant spaces of an open mall building shall be independent from that provided for anchor buildings.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an open mall.
5. Where tenant spaces are supplied by the same system, they shall be independently controlled.

**Exception:** An automatic sprinkler system shall not be required in spaces or areas of open parking garages separated from the covered or open mall building in accordance with Section 402.4.2.3 and constructed in accordance with Section 406.5.

**402.6 Interior finishes and features.** Interior finishes within the mall and installations within the mall shall comply with Sections 402.6.1 through 402.6.4.

**402.6.1 Interior finish.** Interior wall and ceiling finishes within the mall of a covered mall building and within the exits of covered or open mall buildings shall have a minimum flame spread index and smoke-developed index of Class B in accordance with Chapter 8. Interior floor finishes shall meet the requirements of Section 804.

**402.6.2 Kiosks.** Kiosks and similar structures (temporary or permanent) located within the mall of a covered mall building or within the perimeter line of an open mall building shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within a covered or open mall unless constructed of any of the following materials:
  - 1.1. Fire-retardant-treated wood complying with Section 2303.2.
  - 1.2. Foam plastics having a maximum heat release rate not greater than 100 kW (105 Btu/h) when tested in accordance with the exhibit booth protocol in UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source.
  - 1.3. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended.
2. Kiosks or similar structures located within the mall shall be provided with approved automatic sprinkler system and detection devices.

3. The horizontal separation between kiosks or groupings thereof and other structures within the mall shall be not less than 20 feet (6096 mm).
4. Each kiosk or similar structure or groupings thereof shall have an area not greater than 300 square feet ( $28 \text{ m}^2$ ).

**402.6.3 Children's play structures.** Children's play structures located within the mall of a covered mall building or within the perimeter line of an open mall building shall comply with Section 424. The horizontal separation between children's play structures, kiosks and similar structures within the mall shall be not less than 20 feet (6096 mm).

**402.6.4 Plastic signs.** Plastic signs affixed to the storefront of any tenant space facing a mall or open mall shall be limited as specified in Sections 402.6.4.1 through 402.6.4.5.

**402.6.4.1 Area.** Plastic signs shall be not more than 20 percent of the wall area facing the mall.

**402.6.4.2 Height and width.** Plastic signs shall be not greater than 36 inches (914 mm) in height, except that if the sign is vertical, the height shall be not greater than 96 inches (2438 mm) and the width shall be not greater than 36 inches (914 mm).

**402.6.4.3 Location.** Plastic signs shall be located not less than 18 inches (457 mm) from adjacent tenants.

**402.6.4.4 Plastics other than foam plastics.** Plastics other than foam plastics used in signs shall be light-transmitting plastics complying with Section 2606.4 or shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929, and a flame spread index not greater than 75 and smoke-developed index not greater than 450 when tested in the manner intended for use in accordance with ASTM E 84 or UL 723 or meet the acceptance criteria of Section 803.1.2.1 when tested in accordance with NFPA 286.

**402.6.4.4.1 Encasement.** Edges and backs of plastic signs in the mall shall be fully encased in metal.

**402.6.4.5 Foam plastics.** Foam plastics used in signs shall have flame-retardant characteristics such that the sign has a maximum heat-release rate of 150 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source, and the foam plastics shall have the physical characteristics specified in this section. Foam plastics used in signs installed in accordance with Section 402.6.4 shall not be required to comply with the flame spread and smoke-developed indices specified in Section 2603.3.

**402.6.4.5.1 Density.** The density of foam plastics used in signs shall be not less than 20 pounds per cubic foot (pcf) ( $320 \text{ kg/m}^3$ ).

**402.6.4.5.2 Thickness.** The thickness of foam plastic signs shall not be greater than  $\frac{1}{2}$  inch (12.7 mm).

**[F] 402.7 Emergency systems.** Covered and open mall buildings, anchor buildings and associated parking garages shall be provided with emergency systems complying with Sections 402.7.1 through 402.7.5.

**[F] 402.7.1 Standpipe system.** Covered and open mall buildings shall be equipped throughout with a standpipe system as required by Section 905.3.3.

**[F] 402.7.2 Smoke control.** Where a covered mall building contains an atrium, a smoke control system shall be provided in accordance with Section 404.5.

**Exception:** A smoke control system is not required in covered mall buildings where an atrium connects only two stories.

**[F] 402.7.3 Standby power.** Covered mall buildings greater than 50,000 square feet ( $4645 \text{ m}^2$ ) in area and open mall buildings greater than 50,000 square feet ( $4645 \text{ m}^2$ ) within the established perimeter line shall be provided with standby power systems that are capable of operating the emergency voice/alarm communication system.

**[F] 402.7.4 Emergency voice/alarm communication system.** Where the total floor area is greater than 50,000 square feet ( $4645 \text{ m}^2$ ) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided.

Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The systems shall be provided in accordance with Section 907.5.2.2.

**[F] 402.7.5 Fire department access to equipment.** Rooms or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems, automatic sprinkler systems or other detection, suppression or control elements shall be identified for use by the fire department.

**402.8 Means of egress.** Covered mall buildings, open mall buildings and each tenant space within a mall building shall be provided with means of egress as required by this section and this code. Where there is a conflict between the requirements of this code and the requirements of Sections 402.8.1 through 402.8.8, the requirements of Sections 402.8.1 through 402.8.8 shall apply.

**402.8.1 Mall width.** For the purpose of providing required egress, malls are permitted to be considered as corridors but need not comply with the requirements of Section 1005.1 of this code where the width of the mall is as specified in this section.

**402.8.1.1 Minimum width.** The aggregate clear egress width of the mall in either a covered or open mall building shall be not less than 20 feet (6096 mm). The mall width shall be sufficient to accommodate the occupant load served. No portion of the minimum required aggregate egress width shall be less than 10 feet (3048 mm) measured to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall and the nearest kiosk, vending machine, bench, display

opening, food court or other obstruction to means of egress travel.

**402.8.2 Determination of occupant load.** The occupant load permitted in any individual tenant space in a covered or open mall building shall be determined as required by this code. Means of egress requirements for individual tenant spaces shall be based on the occupant load thus determined.

**402.8.2.1 Occupant formula.** In determining required means of egress of the mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered or open mall building (excluding anchor buildings) and the occupant load factor as determined by Equation 4-1.

$$OLF = (0.00007) (GLA) + 25 \quad (\text{Equation 4-1})$$

where:

*OLF* = The occupant load factor (square feet per person).

*GLA* = The gross leasable area (square feet).

**Exception:** Tenant spaces attached to a covered or open mall building but with a means of egress system that is totally independent of the open mall of an open mall building or of a covered mall building shall not be considered as gross leasable area for determining the required means of egress for the mall building.

**402.8.2.2 OLF range.** The occupant load factor (OLF) is not required to be less than 30 and shall not exceed 50.

**402.8.2.3 Anchor buildings.** The occupant load of anchor buildings opening into the mall shall not be included in computing the total number of occupants for the mall.

**402.8.2.4 Food courts.** The occupant load of a food court shall be determined in accordance with Section 1004. For the purposes of determining the means of egress requirements for the mall, the food court occupant load shall be added to the occupant load of the covered or open mall building as calculated above.

**402.8.3 Number of means of egress.** Wherever the distance of travel to the mall from any location within a tenant space used by persons other than employees is greater than 75 feet (22 860 mm) or the tenant space has an occupant load of 50 or more, no fewer than two means of egress shall be provided.

**402.8.4 Arrangements of means of egress.** Assembly occupancies with an occupant load of 500 or more located within a covered mall building shall be so located such that their entrance will be immediately adjacent to a principal entrance to the mall and shall have not less than one-half of their required means of egress opening directly to the exterior of the covered mall building. Assembly occupancies located within the perimeter line of an open mall building shall be permitted to have their main exit open to the open mall.

**402.8.4.1 Anchor building means of egress.** Required means of egress for anchor buildings shall be provided independently from the mall means of egress system. The occupant load of anchor buildings opening into the mall shall not be included in determining means of egress requirements for the mall. The path of egress travel of malls shall not exit through anchor buildings. Malls terminating at an anchor building where no other means of egress has been provided shall be considered as a dead-end mall.

**402.8.5 Distance to exits.** Within each individual tenant space in a covered or open mall building, the distance of travel from any point to an exit or entrance to the mall shall be not greater than 200 feet (60 960 mm).

The distance of travel from any point within a mall of a covered mall building to an exit shall be not greater than 200 feet (60 960 mm). The maximum distance of travel from any point within an open mall to the perimeter line of the open mall building shall be not greater than 200 feet (60 960 mm).

**402.8.6 Access to exits.** Where more than one exit is required, they shall be so arranged that it is possible to travel in either direction from any point in a mall of a covered mall building to separate exits or from any point in an open mall of an open mall building to two separate locations on the perimeter line, provided neither location is an exterior wall of an anchor building or parking garage. The width of an exit passageway or corridor from a mall shall be not less than 66 inches (1676 mm).

**Exception:** Access to exits are permitted by way of a dead-end mall which does not exceed a length equal to twice the width of the mall measured at the narrowest location within the dead-end portion of the mall.

**402.8.6.1 Exit passageways.** Where exit passageways provide a secondary means of egress from a tenant space, doorways to the exit passageway shall be protected by 1-hour fire door assemblies that are self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**402.8.7 Service areas fronting on exit passageways.** Mechanical rooms, electrical rooms, building service areas and service elevators are permitted to open directly into exit passageways, provided the exit passageway is separated from such rooms with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire protection rating of openings in the fire barriers shall be not less than 1 hour.

**402.8.8 Security grilles and doors.** Horizontal sliding or vertical security grilles or doors that are a part of a required means of egress shall conform to the following:

1. They shall remain in the full open position during the period of occupancy by the general public.
2. Doors or grilles shall not be brought to the closed position when there are 10 or more persons occupying spaces served by a single exit or 50 or more persons occupying spaces served by more than one exit.

3. The doors or grilles shall be openable from within without the use of any special knowledge or effort where the space is occupied.
4. Where two or more exits are required, not more than one-half of the exits shall be permitted to include either a horizontal sliding or vertical rolling grille or door.

### SECTION 403

#### **HIGH-RISE BUILDINGS AND GROUP I-2 OCCUPANCIES HAVING OCCUPIED FLOORS LOCATED MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS**

**403.1 Applicability.** *New high-rise buildings and new Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall comply with Sections 403.2 through 403.7.*

**Exception:** The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.3.
2. Open parking garages in accordance with Section 406.5.
3. Buildings with a Group A-5 occupancy in accordance with Section 303.6.
4. Special industrial occupancies in accordance with Section 503.1.1.
5. *Buildings such as power plants, lookout towers, steeples, grain houses and similar structures with noncontinuous human occupancy, when so determined by the enforcing agency.*

*For existing high-rise buildings, see Section 3414 and for existing Group R occupancies, see Section 3413.13.*

*For the purpose of this section, in determining the level from which the highest occupied floor is to be measured, the enforcing agency should exercise reasonable judgment, including consideration of overall accessibility to the building by fire department personnel and vehicular equipment. When a building is located on sloping terrain and there is building access on more than one level, the enforcing agency may select the level that provides the most logical and adequate fire department access.*

**403.1.1 Definitions.** *The following terms are defined in Chapter 2.*

**HIGH-RISE BUILDING.**

**HIGH-RISE BUILDING ACCESS.**

**NEW HIGH-RISE BUILDING.**

**403.2 Construction.** The construction of high-rise buildings shall comply with the provisions of Sections 403.2.1 through 403.2.4.

**403.2.1 Reduction in fire-resistance rating.** The fire-resistance-rating reductions listed in Sections 403.2.1.1

and 403.2.1.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

**Exception:** *Buildings, or portions of buildings, classified as a Group H-1, H-2 or H-3 occupancy.*

**403.2.1.1 Type of construction.** The following reductions in the minimum fire-resistance rating of the building elements in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 000 mm) in building height, the fire-resistance rating of the building elements in Type IA construction shall be permitted to be reduced to the minimum fire-resistance ratings for the building elements in Type IB.

**Exception:** *The required fire-resistance rating of the Structural Frame shall not be permitted to be reduced.*

2. In other than Group F-1, M and S-1 occupancies, the fire-resistance rating of the building elements in Type IB construction shall be permitted to be reduced to the fire-resistance ratings in Type IIA.

**Exception:** *The required fire-resistance rating of the structural frame shall not be permitted to be reduced.*

3. The building height and building area limitations of a building containing building elements with reduced fire-resistance ratings shall be permitted to be the same as the building without such reductions.

**403.2.1.2 Shaft enclosures.** For buildings not greater than 420 feet (128 000 mm) in building height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, is permitted to be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

**403.2.2 Seismic considerations.** For seismic considerations, see Chapter 16.

**403.2.3 Structural integrity of interior exit stairways and elevator hoistway enclosures.** For high-rise buildings of Risk Category III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 000 mm) in building height, enclosures for interior exit stairways and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4.

**403.2.3.1 Wall assembly.** The wall assemblies making up the enclosures for interior exit stairways and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.2 Wall assembly materials.** The face of the wall assemblies making up the enclosures for interior exit stairways and elevator hoistway enclosures that are not exposed to the interior of the enclosures for interior

exit stairways or elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate no fewer than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.
2. The wall assembly shall incorporate no fewer than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.
3. The wall assembly incorporates multiple layers of any material, tested in tandem, that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.3 Concrete and masonry walls.** Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.2.3.1 and 403.2.3.2.

**403.2.3.4 Other wall assemblies.** Any other wall assembly that provides impact resistance equivalent to that required by Sections 403.2.3.1 and 403.2.3.2 for Hard Body Impact Classification Level 3, as measured by the test method described in ASTM C 1629/C 1629M, shall be permitted.

**403.2.4 Sprayed fire-resistant materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

**TABLE 403.2.4  
MINIMUM BOND STRENGTH**

HEIGHT OF BUILDING <sup>a</sup>	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	430 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot (psf) = 0.0479 kW/m<sup>2</sup>.

a. Above the lowest level of fire department vehicle access.

**[F] 403.3 Automatic sprinkler system.** Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2. A sprinkler water-flow alarm-initiating device and a control valve with a supervisory signal-initiating device shall be provided at the lateral connection to the riser for each floor.

**Exception:** An automatic sprinkler system shall not be required in open parking garages in accordance with Section 406.5.

**[F] 403.3.1 Number of sprinkler system risers and system design.** Each sprinkler system serving a floor in buildings that are more than 420 feet (128 000 mm) in building height shall be connected to a minimum of two sprinkler risers or combination standpipe system risers located in separate shafts. Each sprinkler system shall be hydraulically designed so that when one connection is shut

down, the other connection shall be capable of supplying the sprinkler system design demand.

**[F] 403.3.1.1 Riser location.** Sprinkler risers shall be placed in interior exit stairways and ramps that are remotely located in accordance with Section 1015.2.

**[F] 403.3.2 Water supply to required fire pumps.** Required fire pumps shall be supplied by connections to no fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

**Exceptions:**

1. Two connections to the same main shall be permitted provided the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through no fewer than one of the connections.

2. High-rise buildings not having an occupied floor more than 120 feet above the lowest level of fire department vehicle access where a secondary water supply is provided in accordance with Section 903.3.5.2.

**403.3.2.1 Fire pumps:** Redundant fire pump systems shall be required for high-rise buildings having an occupied floor more than 200 feet above the lowest level of fire department vehicle access. Each fire pump system shall be capable of automatically supplying the required demand for the automatic sprinkler and standpipe systems.

**[F] 403.3.3 Fire pump room.** Fire pumps shall be located in rooms protected in accordance with Section 913.2.1.

**403.3.4 Fire pumps.** See Section 913.6.

**[F] 403.4 Emergency systems.** The detection, alarm and emergency systems of high-rise buildings shall comply with Sections 403.4.1 through 403.4.9.

**[F] 403.4.1 Smoke detection.** Smoke detection shall be provided in accordance with Section 907.2.13.1.

**[F] 403.4.2 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.13.

**[F] 403.4.3 Standpipe system.** A high-rise building shall be equipped with a standpipe system as required by Section 905.3.

**[F] 403.4.4 Emergency voice/alarm communication system.** An emergency voice/alarm communication system shall be provided in accordance with Section 907.5.2.2

**[F] 403.4.5 Emergency responder radio coverage.** Emergency responder radio coverage shall be provided in accordance with Section 510 of the *California Fire Code*.

**[F] 403.4.6 Fire command.** A fire command center complying with Section 911 shall be provided in a location approved by the fire department.

**403.4.7 Smoke removal.**

||>  
||> **403.4.7.1 Smoke control system.** All portions of high-rise buildings shall be provided with a smoke control system in accordance with Section 909

**[F] 403.4.8 Standby power.** A standby power system complying with Chapter 27 and Section 3003 shall be provided for standby power loads specified in 403.4.8.2. Where elevators are provided in a high-rise building for accessible means of egress, fire service access or occupant self-evacuation, the standby power system shall also comply with Sections 1007.4, 3007 or 3008, as applicable.

**[F] 403.4.8.1 Special requirements for standby power systems.** If the standby system is a generator set inside a building, the system shall be located in a separate room enclosed with 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. System supervision with manual start and transfer features shall be provided at the fire command center.

**[F] 403.4.8.2 Standby power loads.** The following are classified as standby power loads:

1. Power and lighting for the fire command center required by Section 403.4.6;
2. Ventilation and automatic fire detection equipment for smokeproof enclosures; and
3. Elevators.

**[F] 403.4.9 Emergency power systems.** An emergency power system complying with Chapter 27 shall be provided for emergency power loads specified in Section 403.4.9.1.

**[F] 403.4.9.1 Emergency power loads.** The following are classified as emergency power loads:

1. Exit signs and means of egress illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems;
5. Fire alarm systems; and
6. Electrically powered fire pumps.

**403.5 Means of egress and evacuation.** The means of egress in high-rise buildings shall comply with Sections 403.5.1 through 403.5.6.

**403.5.1 Remoteness of interior exit stairways.** Required interior exit stairways shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the interior exit stairways. In buildings with three or more interior exit stairways, no fewer than two of the interior exit stairways shall comply with this section. Interlocking or scissor stairs shall be counted as one interior exit stairway.

**403.5.2 Additional exit stairway.** For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in building height, one additional exit stairway meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of exits required by Section 1021.1. The total width of any combination of remaining exit stairways with one exit stairway removed shall be not less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stairway required by this section.

**Exception:** An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.

**403.5.3 Stairway door operation.** Stairway doors other than the exit discharge doors shall be permitted to be locked from the stairway side. Stairway doors that are locked from the stairway side shall be capable of being unlocked simultaneously without unlatching upon a signal from the fire command center. *Upon failure of electrical power to the locking mechanism the door shall unlock.*

**403.5.3.1 Stairway communication system.** A telephone or other two-way communications system connected to an approved constantly attended station shall be provided at not less than every fifth floor in each stairway where the doors to the stairway are locked.

**403.5.4 Smokeproof enclosures.** Every exit enclosure in high-rise buildings shall comply with Sections 909.20 and 1022.10. Every required level exit stairway in Group I-2 occupancies serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1022.10.

**Exception:** In high-rise buildings, exit enclosures serving three or less adjacent floors where one of the adjacent floors is the level of exit discharge.

**403.5.5 Luminous egress path markings.** Luminous egress path markings shall be provided in accordance with Section 1024.

**403.5.6 Emergency escape and rescue.** Emergency escape and rescue openings required by Section 1029 are not required.

**403.6 Elevators.** Elevator installation and operation in high-rise buildings shall comply with Chapter 30 and Sections 403.6.1 and 403.6.2.

*Enclosed elevator lobbies shall be provided in accordance with Section 713.14.1. Exceptions 3, 5, 6 and 8 shall only be permitted where approved by the Fire Chief in accordance with Section 1.11.2.1.1 or in accordance with Section 1.11.2.1.2 for all state-owned buildings, state-occupied buildings, and state institutions throughout the state.*

**403.6.1 Fire service access elevator.** In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, no fewer than two fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007. Each fire service access elevator shall have a capacity of not less than 3500 pounds (1588 kg).

**403.6.2 Occupant evacuation elevators.** Where installed in accordance with Section 3008, passenger elevators for general public use shall be permitted to be used for occupant self-evacuation.

**403.7 Existing high-rise buildings.** For existing high-rise buildings, see Section 3414.

## SECTION 404 atriums

**404.1 General.** In other than Group H occupancies, and where permitted by Section 712.1.6, the provisions of Sections 404.1 through 404.9 shall apply to buildings or structures containing vertical openings defined as "Atriums."

**404.1.1 Definition.** The following term is defined in Chapter 2:

### ATRIUM.

**404.2 Use.** The floor of the atrium shall not be used for other than low fire hazard uses and only approved materials and decorations in accordance with the *California Fire Code* shall be used in the atrium space.

**Exception:** The atrium floor area is permitted to be used for any approved use where the individual space is provided with an automatic sprinkler system in accordance with Section 903.3.1.1.

**[F] 404.3 Automatic sprinkler protection.** An approved automatic sprinkler system shall be installed throughout the entire building.

#### Exceptions:

1. That area of a building adjacent to or above the atrium need not be sprinklered provided that portion of the building is separated from the atrium portion by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

**[F] 404.4 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.14.

**404.5 Smoke control.** A smoke control system shall be installed in accordance with Section 909.

**Exception:** Smoke control is not required for atriums that connect only two stories.

**404.6 Enclosure of atriums.** Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

**Exception:** A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:

1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side

only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;

- 1.1. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
- 1.2. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic-closing.
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a  $\frac{3}{4}$ -hour fire protection rating is provided.
3. A fire barrier is not required between the atrium and the adjoining spaces of any three floors of the atrium provided such spaces are accounted for in the design of the smoke control system.

**[F] 404.7 Standby power.** Equipment required to provide smoke control shall be connected to a standby power system in accordance with Section 909.11.

**404.8 Interior finish.** The interior finish of walls and ceilings of the atrium shall be not less than Class B with no reduction in class for sprinkler protection.

**404.9 Travel distance.** In other than the lowest level of the atrium, where the required means of egress is through the atrium space, the portion of exit access travel distance within the atrium space shall be not greater than 200 feet (60 960 mm). The travel distance requirements for areas of buildings open to the atrium and where access to the exits is not through the atrium, shall comply with the requirements of Section 1016.

**404.10 Group I and R-2.1 occupancy means of egress.** Required means of egress from sleeping rooms in Group I and R-2.1 occupancies shall not pass through the atrium.

## SECTION 405 UNDERGROUND BUILDINGS

**405.1 General.** The provisions of Sections 405.2 through 405.10 apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

**Exception:** The provisions of Section 405 are not applicable to the following buildings or portions of buildings:

1. One- and two-family dwellings, sprinklered in accordance with Section 903.3.1.3.
2. Parking garages provided with automatic sprinkler systems in compliance with Section 405.3.
3. Fixed guideway transit systems.

4. Grandstands, bleachers, stadiums, arenas and similar facilities.
5. Where the lowest story is the only story that would qualify the building as an underground building and has an area not greater than 1,500 square feet (139 m<sup>2</sup>) and has an occupant load less than 10.
6. Pumping stations and other similar mechanical spaces intended only for limited periodic use by service or maintenance personnel.

**405.2 Construction requirements.** The underground portion of the building shall be of Type I construction.

**[F] 405.3 Automatic sprinkler system.** The highest level of exit discharge serving the underground portions of the building and all levels below shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Water-flow switches and control valves shall be supervised in accordance with Section 903.4.

**405.4 Compartmentation.** Compartmentation shall be in accordance with Sections 405.4.1 through 405.4.3.

**405.4.1 Number of compartments.** A building having a floor level more than 60 feet (18 288 mm) below the finished floor of the lowest level of exit discharge shall be divided into no fewer than two compartments of approximately equal size. Such compartmentation shall extend through the highest level of exit discharge serving the underground portions of the building and all levels below.

**Exception:** The lowest story need not be compartmented where the area is not greater than 1,500 square feet (139 m<sup>2</sup>) and has an occupant load of less than 10.

**405.4.2 Smoke barrier penetration.** The compartments shall be separated from each other by a smoke barrier in accordance with Section 709. Penetrations between the two compartments shall be limited to plumbing and electrical piping and conduit that are firestopped in accordance with Section 714. Doorways shall be protected by fire door assemblies that are automatic-closing by smoke detection in accordance with Section 716.5.9.3 and are installed in accordance with NFPA 105 and Section 716.5.3. Where provided, each compartment shall have an air supply and an exhaust system independent of the other compartments.

**405.4.3 Elevators.** Where elevators are provided, each compartment shall have direct access to an elevator. Where an elevator serves more than one compartment, an elevator lobby shall be provided and shall be separated from each compartment by a smoke barrier in accordance with Section 709. Doors shall be gasketed, have a drop sill and be automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**405.5 Smoke control system.** A smoke control system shall be provided in accordance with Sections 405.5.1 and 405.5.2.

**405.5.1 Control system.** A smoke control system is required to control the migration of products of combustion in accordance with Section 909 and the provisions of this section. Smoke control shall restrict movement of

smoke to the general area of fire origin and maintain means of egress in a usable condition.

**405.5.2 Compartment smoke control system.** Where compartmentation is required, each compartment shall have an independent smoke control system. The system shall be automatically activated and capable of manual operation in accordance with Sections 907.2.18 and 907.2.19.

**[F] 405.6 Fire alarm systems.** A fire alarm system shall be provided where required by Sections 907.2.18 and 907.2.19.

**405.7 Means of egress.** Means of egress shall be in accordance with Sections 405.7.1 and 405.7.2.

**405.7.1 Number of exits.** Each floor level shall be provided with no fewer than two exits. Where compartmentation is required by Section 405.4, each compartment shall have no fewer than one exit and shall also have no fewer than one exit access doorway into the adjoining compartment.

**405.7.2 Smokeproof enclosure.** Every required stairway serving floor levels more than 30 feet (9144 mm) below the finished floor of its level of exit discharge shall comply with the requirements for a smokeproof enclosure as provided in Section 1022.10.

**[F] 405.8 Standby power.** A standby power system complying with Chapter 27 shall be provided standby power loads specified in Section 405.8.1.

**[F] 405.8.1 Standby power loads.** The following loads are classified as standby power loads:

1. Smoke control system.
2. Ventilation and automatic fire detection equipment for smokeproof enclosures.
3. Fire pumps.

Standby power shall be provided for elevators in accordance with Section 3003.

**[F] 405.8.2 Pick-up time.** The standby power system shall pick up its connected loads within 60 seconds of failure of the normal power supply.

**[F] 405.9 Emergency power.** An emergency power system complying with Chapter 27 shall be provided for emergency power loads specified in Section 405.9.1.

**[F] 405.9.1 Emergency power loads.** The following loads are classified as emergency power loads:

1. Emergency voice/alarm communications systems.
2. Fire alarm systems.
3. Automatic fire detection systems.
4. Elevator car lighting.
5. Means of egress and exit sign illumination as required by Chapter 10.

**[F] 405.10 Standpipe system.** The underground building shall be equipped throughout with a standpipe system in accordance with Section 905.

## SECTION 406

### MOTOR-VEHICLE-RELATED OCCUPANCIES

*Section 406 has been completely reorganized from the 2009 code; therefore, the \* and \*\* margin indicators have not been included for clarity.*

**406.1 General.** Motor-vehicle-related occupancies shall comply with Sections 406.1 through 406.8.

**406.2 Definitions.** The following terms are defined in Chapter 2:

#### MECHANICAL-ACCESS OPEN PARKING GARAGES. OPEN PARKING GARAGE.

#### RAMP-ACCESS OPEN PARKING GARAGES.

**406.3 Private garages and carports.** Private garages and carports shall comply with Sections 406.3.1 through 406.3.5.

**406.3.1 Classification.** Buildings or parts of buildings classified as Group U occupancies because of the use or character of the occupancy shall be not greater than 1,000 square feet ( $93\text{ m}^2$ ) in area or one story in height except as provided in Section 406.3.2. Any building or portion thereof that exceeds the limitations specified in this section shall be classified in the occupancy group other than Group U that it most nearly resembles.

**406.3.2 Area increase.** Group U occupancies used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed are permitted to be 3,000 square feet ( $279\text{ m}^2$ ) where the following provisions are met:

- For a mixed occupancy building, the exterior wall and opening protection for the Group U portion of the building shall be as required for the major occupancy of the building. For such a mixed occupancy building, the allowable floor area of the building shall be as permitted for the major occupancy contained therein.
- For a building containing only a Group U occupancy, the exterior wall shall not be required to have a fire-resistance rating and the area of openings shall not be limited where the fire separation distance is 5 feet (1524 mm) or more.

More than one 3,000-square-foot ( $279\text{ m}^2$ ) Group U occupancy shall be permitted to be in the same structure, provided each 3,000-square-foot ( $279\text{ m}^2$ ) area is separated by fire walls complying with Section 706.

**406.3.3 Garages and carports.** Carports shall be open on no fewer than two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

**Exception:** Asphalt surfaces shall be permitted at ground level in carports.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

**406.3.4 Separation.** Separations shall comply with the following:

- The private garage shall be separated from the dwelling unit and its attic area by means of gypsum board, not less than  $\frac{1}{2}$  inch (12.7 mm) in thickness, applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a  $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board or equivalent and  $\frac{1}{2}$ -inch (12.7 mm) gypsum board applied to structures supporting the separation from habitable rooms above the garage. Door openings between a private garage and the dwelling unit shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than  $1\frac{3}{8}$  inches (34.9 mm) in thickness, or doors in compliance with Section 716.5.3 with a fire protection rating of not less than 20 minutes. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be self-closing and self-latching.
- Ducts in a private garage and ducts penetrating the walls or ceilings separating the dwelling unit, including its attic area, from the garage shall be constructed of sheet steel of not less than 0.019 inches (0.48 mm), in thickness, and shall have no openings into the garage.
- A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

**406.3.5 Automatic garage door openers.** Automatic garage door openers, if provided, shall be listed in accordance with UL 325. See *Health and Safety Code Sections 19890 and 19891 for additional provisions for residential garage door openers.*

**406.4 Public parking garages.** Parking garages other than private parking garages, shall be classified as public parking garages and shall comply with the provisions of Sections 406.4.2 through 406.4.8 and shall be classified as either an open parking garage or an enclosed parking garage. Open parking garages shall also comply with Section 406.5. Enclosed parking garages shall also comply with Section 406.6. See Section 510 for special provisions for parking garages.

**406.4.1 Clear height.** The clear height of each floor level in vehicle and pedestrian traffic areas shall be not less than 7 feet (2134 mm). *(HCD 1-AC) The clear height of vehicle and pedestrian areas required to be accessible shall comply with Chapter 11A.*

**406.4.2 Guards.** Guards shall be provided in accordance with Section 1013. Guards serving as vehicle barriers shall comply with Sections 406.4.3 and 1013.

**406.4.3 Vehicle barriers.** Vehicle barriers not less than 2 feet 9 inches (835 mm) in height shall be placed at the ends

of drive lanes, and at the end of parking spaces where the vertical distance to the ground or surface directly below is greater than 1 foot (305 mm). Vehicle barriers shall comply with the loading requirements of Section 1607.8.3.

**Exception:** Vehicle barriers are not required in vehicle storage compartments in a mechanical access parking garage.

**406.4.4 Ramps.** Vehicle ramps shall not be considered as required exits unless pedestrian facilities are provided. Vehicle ramps that are utilized for vertical circulation as well as for parking shall not exceed a slope of 1:15 (6.67 percent).

**406.4.5 Floor surface.** Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

**Exceptions:**

1. Asphalt parking surfaces shall be permitted at ground level.
2. Floors of Group S-2 parking garages shall not be required to have a sloped surface.

**406.4.6 Mixed occupancy separation.** Parking garages shall be separated from other occupancies in accordance with Section 508.1.

**406.4.7 Special hazards.** Connection of a parking garage with any room in which there is a fuel-fired appliance shall be by means of a vestibule providing a two-doorway separation.

**Exception:** A single door shall be allowed provided the sources of ignition in the appliance are not less than 18 inches (457 mm) above the floor.

**406.4.8 Attached to rooms.** Openings from a parking garage directly into a room used for sleeping purposes shall not be permitted.

**406.5 Open parking garages.** Open parking garages shall comply with Sections 406.5.1 through 406.5.11.

**406.5.1 Construction.** Open parking garages shall be of Type I, II or IV construction. Open parking garages shall meet the design requirements of Chapter 16. For vehicle barriers, see Section 406.4.3.

**406.5.2 Openings.** For natural ventilation purposes, the exterior side of the structure shall have uniformly distributed openings on two or more sides. The area of such openings in exterior walls on a tier shall be not less than 20 percent of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall be not less than 40 percent of the perimeter of the tier. Interior walls shall be not less than 20 percent open with uniformly distributed openings.

**Exception:** Openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building.

**406.5.2.1 Openings below grade.** Where openings below grade provide required natural ventilation, the outside horizontal clear space shall be one and one-half times the depth of the opening. The width of the horizontal clear space shall be maintained from grade down to the bottom of the lowest required opening.

**406.5.3 Uses.** Mixed uses shall be allowed in the same building as an open parking garage subject to the provisions of Sections 402.4.2.3, 406.5.11, 508.1, 510.3, 510.4 and 510.7.

**406.5.4 Area and height.** Area and height of open parking garages shall be limited as set forth in Chapter 5 for Group S-2 occupancies and as further provided for in Section 508.1.

**406.5.4.1 Single use.** Where the open parking garage is used exclusively for the parking or storage of private motor vehicles, with no other uses in the building, the area and height shall be permitted to comply with Table 406.5.4, along with increases allowed by Section 406.5.5.

**Exception:** The grade-level tier is permitted to contain an office, waiting and toilet rooms having a total combined area of not more than 1,000 square feet ( $93\text{ m}^2$ ). Such area need not be separated from the open parking garage.

In open parking garages having a spiral or sloping floor, the horizontal projection of the structure at any cross section shall not exceed the allowable area per parking tier. In the case of an open parking garage having a continuous spiral floor, each 9 feet 6 inches (2896 mm) of height, or portion thereof, shall be considered a tier.

TABLE 406.5.4  
OPEN PARKING GARAGES AREA AND HEIGHT

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	HEIGHT (in tiers)		
		Ramp access	Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited
IB	Unlimited	12 tiers	12 tiers	18 tiers
IIA	50,000	10 tiers	10 tiers	15 tiers
IIB	50,000	8 tiers	8 tiers	12 tiers
IV	50,000	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m<sup>2</sup>.

The clear height of a parking tier shall be not less than 7 feet (2134 mm), except that a lower clear height is permitted in mechanical-access open parking garages where approved by the building official.

**406.5.5 Area and height increases.** The allowable area and height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. For purposes of calculating the interior area of the side, the height shall not exceed 7 feet (2134 mm).

Allowable tier areas in Table 406.5.4 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. No fewer than three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for not less than 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or *yard* accessible to a street with a width of not less than 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the building height does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. For purposes of calculating the interior area of the side, the height shall not exceed 7 feet (2134 mm). All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.5.2. These openings shall be permitted to be provided in courts with a minimum dimension of 20 feet (6096 mm) for the full width of the openings.

**406.5.6 Fire separation distance.** Exterior walls and openings in exterior walls shall comply with Tables 601 and 602. The distance to an adjacent lot line shall be determined in accordance with Table 602 and Section 705.

**406.5.7 Means of egress.** Where persons other than parking attendants are permitted, open parking garages shall meet the means of egress requirements of Chapter 10. Where no persons other than parking attendants are permitted, there shall be no fewer than two exit stairways. Each exit stairway shall be not less than 36 inches (914 mm) in width. Lifts shall be permitted to be installed for use of employees only, provided they are completely enclosed by noncombustible materials.

[F] **406.5.8 Standpipe system.** An open parking garage shall be equipped with a standpipe system as required by Section 905.3.

**406.5.9 Enclosure of vertical openings.** Enclosure shall not be required for vertical openings except as specified in Section 406.5.7.

**406.5.10 Ventilation.** Ventilation, other than the percentage of openings specified in Section 406.5.2, shall not be required.

**406.5.11 Prohibitions.** The following uses and alterations are not permitted:

1. Vehicle repair work.
2. Parking of buses, trucks and similar vehicles.
3. Partial or complete closing of required openings in exterior walls by tarpaulins or any other means.
4. Dispensing of fuel.

**406.6 Enclosed parking garages.** Enclosed parking garages shall comply with Sections 406.6.1 through 406.6.3.

**406.6.1 Heights and areas.** Enclosed vehicle parking garages and portions thereof that do not meet the definition of open parking garages shall be limited to the allowable heights and areas specified in Table 503 as modified by Sections 504, 506 and 507. Roof parking is permitted.

**406.6.2 Ventilation.** A mechanical ventilation system shall be provided in accordance with the *California Mechanical Code*.

[F] **406.6.3 Automatic sprinkler system.** An enclosed parking garage shall be equipped with an automatic sprinkler system in accordance with Section 903.2.10.

**406.7 Motor fuel-dispensing facilities.** Motor fuel-dispensing facilities shall comply with the *California Fire Code* and Sections 406.7.1 and 406.7.2.

**406.7.1 Vehicle fueling pad.** The vehicle shall be fueled on noncoated concrete or other *approved* paving material having a resistance not exceeding 1 megohm as determined by the methodology in EN 1081.

**406.7.2 Canopies.** Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches (4115 mm) to the lowest projecting element in the vehicle drive-through area. Canopies and their supports over pumps shall be of noncombustible materials, fire-retardant-treated wood complying with Chapter 23, wood of Type IV sizes or of construction providing 1-hour fire resistance. Combustible materials used in or on a canopy shall comply with one of the following:

1. Shielded from the pumps by a noncombustible element of the canopy, or wood of Type IV sizes;
2. Plastics covered by aluminum facing having a thickness of not less than 0.010 inch (0.30 mm) or corrosion-resistant steel having a base metal thickness of not less than 0.016 inch (0.41 mm). The plastic shall have a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in the form intended for use in accordance with ASTM E

84 or UL 723 and a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929; or

3. Panels constructed of light-transmitting plastic materials shall be permitted to be installed in canopies erected over motor vehicle fuel-dispensing station fuel dispensers, provided the panels are located not less than 10 feet (3048 mm) from any building on the same lot and face yards or streets not less than 40 feet (12 192 mm) in width on the other sides. The aggregate areas of plastics shall be not greater than 1,000 square feet (93 m<sup>2</sup>). The maximum area of any individual panel shall be not greater than 100 square feet (9.3 m<sup>2</sup>).

**406.7.2.1 Canopies used to support gaseous hydrogen systems.** Canopies that are used to shelter dispensing operations where flammable compressed gases are located on the roof of the canopy shall be in accordance with the following:

1. The canopy shall meet or exceed Type I construction requirements.
2. Operations located under canopies shall be limited to refueling only.
3. The canopy shall be constructed in a manner that prevents the accumulation of hydrogen gas.

**406.8 Repair garages.** Repair garages shall be constructed in accordance with the *California Fire Code* and Sections 406.8.1 through 406.8.6. This occupancy shall not include motor fuel-dispensing facilities, as regulated in Section 406.7.

**406.8.1 Mixed uses.** Mixed uses shall be allowed in the same building as a repair garage subject to the provisions of Section 508.1.

**406.8.2 Ventilation.** Repair garages shall be mechanically ventilated in accordance with the *California Mechanical Code*. The ventilation system shall be controlled at the entrance to the garage.

**406.8.3 Floor surface.** Repair garage floors shall be of concrete or similar noncombustible and nonabsorbent materials.

**Exception:** Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm<sup>2</sup>, as determined by NFPA 253, shall be permitted.

**406.8.4 Heating equipment.** Heating equipment shall be installed in accordance with the *California Mechanical Code*.

**[F] 406.8.5 Gas detection system.** Repair garages used for the repair of vehicles fueled by nonodorized gases such as hydrogen and nonodorized LNG, shall be provided with a flammable gas detection system.

**[F] 406.8.5.1 System design.** The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas

exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall be provided in lubrication or chassis service pits of repair garages used for repairing non-odorized LNG-fueled vehicles.

**[F] 406.8.5.1.1 Gas detection system components.**

Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

**[F] 406.8.5.2 Operation.** Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals in the repair garage.
2. Deactivation of all heating systems located in the repair garage.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.

**[F] 406.8.5.3 Failure of the gas detection system.**

Failure of the gas detection system shall result in the deactivation of the heating system, activation of the mechanical ventilation system where the system is interlocked with the gas detection system and cause a trouble signal to sound in an approved location.

**[F] 406.8.6 Automatic sprinkler system.** A repair garage shall be equipped with an automatic sprinkler system in accordance with Section 903.2.9.1.

**406.9 Electric vehicle. [SFM]**

**406.9.1 Electric vehicle.** An automotive-type vehicle for highway use, such as passenger automobiles, buses, trucks, vans and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array or other source of electric current. For the purpose of this chapter, electric motorcycles and similar type vehicles and off-road self-propelled electric vehicles such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not included.

**406.9.2 Charging.** In any building or interior area used for charging electric vehicles, electrical equipment shall be installed in accordance with the *California Electrical Code*.

**406.9.3 Ventilation.** Mechanical exhaust ventilation, when required by the *California Electrical Code* shall be provided at a rate as required by Article 625 or as required by Section 1203 of the *California Building Code* whichever is greater. The ventilation system shall include both the supply and exhaust equipment and shall be permanently installed and located to intake supply air from the outdoors, and vent the exhaust directly to, the outdoors without conducting the exhaust air through other spaces within the building.

**Exception:** Positive pressure ventilation systems shall only be allowed in buildings or areas that have been designed and approved for that application.

**406.9.4 Electrical interface.** The electrical supply circuit to electrically powered mechanical ventilation equipment shall be interlocked with the recharging equipment used to supply the vehicle(s) being charged, and shall remain energized during the entire charging cycle. Electric vehicle recharging equipment shall be marked or labeled in accordance with the California Electrical Code.

**Exceptions:**

1. Exhaust ventilation shall not be required in areas with an approved engineered ventilation system, which maintains a hydrogen gas concentration at less than 25 percent of the lower flammability limit.
2. Mechanical exhaust ventilation for hydrogen shall not be required where the charging equipment utilized is installed and listed for indoor charging of electric vehicles without ventilation.

## SECTION 407

### GROUP I-2

**407.1 General.** Occupancies in Group I-2 and I-2.1 shall comply with the provisions of Sections 407.1 through 407.10 and other applicable provisions of this code.

**407.2 Corridors continuity and separation.** Corridors in occupancies in Group I-2 and I-2.1 shall be continuous to the exits and shall be separated from other areas in accordance with Section 407.3 except spaces conforming to Sections 407.2.1 through 407.2.4.

**407.2.1 Waiting and similar areas.** Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:

1. The spaces are not occupied as care recipient's sleeping rooms, treatment rooms, incidental uses listed in Table 509, or hazardous uses.
2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
3. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
4. The space is arranged so as not to obstruct access to the required exits.
5. Each space is located to permit direct visual supervision by the facility staff.

**407.2.2 Nurses' stations.** Spaces for doctors' and nurses' charting, communications and related clerical areas shall be permitted to be open to, or located within the corridor, provided the required construction along the perimeter of the corridor is maintained. Construction of nurses' stations or portions of nurses' stations, within the envelope of the corridor is not required to be fire-resistive rated.

Nurses' stations in new and existing facilities see the California Code of Regulations, Title 19, Division 1, Chapter 1, Subchapter 1, Article 3, Section 3.11(d) for storage and equipment requirements.

In detention or secure mental health facilities, the provisions above applies to enclosed nurses' stations within the corridor.

**407.2.3 Psychiatric treatment areas.** Areas wherein psychiatric care recipients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental uses in accordance with Section 509, under continuous supervision by facility staff, shall be permitted to be open to the corridor, where the following criteria are met:

1. Each area does not exceed 1,500 square feet ( $140\text{ m}^2$ ).
2. The area is located to permit supervision by the facility staff.
3. The area is arranged so as not to obstruct any access to the required exits.
4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2.
5. Not more than one such space is permitted in any one smoke compartment.
6. The walls and ceilings of the space are constructed as required for corridors.

**407.2.4 Gift shops.** Gift shops and associated storage that are less than 500 square feet ( $455\text{ m}^2$ ) in area shall be permitted to be open to the corridor where such spaces are constructed as required for corridors.

**407.3 Corridor wall construction.** Corridor walls shall be constructed as fire partitions in accordance with Section 708.

**407.3.1 Corridor doors.** Corridor doors, other than those in a wall required to be rated by Section 509.4 or for the enclosure of a vertical opening or an exit, shall not have a required fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 716.5. In Group I-2 Occupancies, self-closing or automatic-closing devices are not required on corridor doors to patient sleeping rooms, treatment rooms, and offices located in areas specified in Sections 1224 and 1225, excluding offices specified in Sections 1224.21 and 1225.8.

**407.3.1.1 Swing of corridor doors.** Corridor doors, other than those equipped with self-closing or automatic-closing devices shall not swing into the required width of corridors.

**Exception:** Doors may swing into required width of corridors in I-3 facilities as long as 44" clear is maintained with any one door open 90 degrees and clear corridor widths required in Chapter 12 can be maintained with doors open 180 degrees.

**407.3.2 Glazing.** In fully sprinklered buildings, fixed fully tempered or laminated glass in wood or metal frames may be used in corridor walls, provided the glazed area does not exceed 25 percent of the areas of the corridor wall of the room. The total area of glass in corridor walls is not limited when the glazing is fixed  $\frac{1}{4}$ -inch-thick (6.4 mm) wired glass in steel frames and the size of individual glazed panel does not exceed 1,296 square inches (0.836 m<sup>2</sup>).

|| **407.4 Means of egress.** Group I-2 and I-2.1 occupancies shall be provided with means of egress complying with Chapter 10 and Sections 407.4.1 through 407.4.3.

|| **407.4.1 Direct access to a corridor.** Habitable rooms in Group I-2 and I-2.1 occupancies shall have an exit access door leading directly to a corridor.

**Exceptions:**

1. Rooms with exit doors opening directly to the outside at ground level.
2. Rooms arranged as care suites complying with Section 407.4.3.

**407.4.1.1 Locking devices.** Locking devices that restrict access to a care recipient's room from the corridor and that are operable only by staff from the corridor side shall not restrict the means of egress from the care recipient's room.

**Exceptions:**

1. This section shall not apply to rooms in psychiatric treatment and similar care areas.
2. Locking arrangements in accordance with Section 1008.1.9.6.

**407.4.1.2 Basement exits.** All rooms below grade shall have not less than one exit access that leads directly to an exterior exit door opening directly to an exit discharge at grade plane or the public way.

|| **407.4.2 Travel distance.** The travel distance between any point in a Group I-2 or I-2.1 occupancy sleeping room and an exit access door in that room shall be not greater than 50 feet (15 240 mm).

|| **407.4.3 Group I-2 care suites.** Care suites in Group I-2 or I-2.1 shall comply with Sections 407.4.3.1 through 407.4.3.4 and either Section 407.4.3.5 or 407.4.3.6.

**407.4.3.1 Exit access through care suites.** Exit access from all other portions of a building not classified as a care suite shall not pass through a care suite. In a care suite required to have more than one exit, one exit access is permitted to pass through an adjacent care suite provided all of the other requirements of Sections 407.4 and 1014.2 are satisfied.

**407.4.3.2 Separation.** Care suites shall be separated from other portions of the building by *not less than a one-hour fire barrier* complying with Section 707. Each suite of rooms shall be separated from the remainder of the building by *not less than a one-hour fire barrier*.

**407.4.3.3 One intervening room.** For rooms other than sleeping rooms located within a care suite, exit access travel from the care suite shall be permitted through one intervening room where the travel distance to the exit access door from the care suite is not greater than 100 feet (30 480 mm).

**407.4.3.4 Two intervening rooms.** For rooms other than sleeping rooms located within a care suite, exit access travel within the care suite shall be permitted through two intervening rooms where the travel distance to the exit access door from the care suite is not greater than 50 feet (15 240 mm).

**407.4.3.5 Care suites containing sleeping room areas.** Sleeping rooms shall be permitted to be grouped into care suites with one intervening room if one of the following conditions is met:

1. The intervening room within the care suite is not used as an exit access for more than eight care recipient beds.
2. The arrangement of the care suite allows for direct and constant visual supervision by care providers.

**407.4.3.5.1 Area.** Care suites containing sleeping rooms shall be not greater than 5,000 square feet (465 m<sup>2</sup>) in area.

**407.4.3.5.2 Exit access.** Any sleeping room, or any care suite that contains sleeping rooms, of more than 1,000 square feet (93 m<sup>2</sup>) shall have no fewer than two exit access doors from the care suite located in accordance with Section 1015.2.

**407.4.3.5.3 Travel distance.** The travel distance between any point in a care suite containing sleeping rooms and an exit access door from that care suite shall be not greater than 100 feet (30 480 mm).

**407.4.3.6 Care suites not containing sleeping rooms.** Areas not containing sleeping rooms, but only treatment areas and the associated rooms, spaces or circulation space shall be permitted to be grouped into care suites and shall conform to the limitations in Section 407.4.3.6.1 and 407.4.3.6.2.

**407.4.3.6.1 Area.** Care suites of rooms, other than sleeping rooms, shall have an area not greater than 10,000 square feet (929 m<sup>2</sup>).

**407.4.3.6.2 Exit access.** Care suites, other than sleeping rooms, with an area of more than 2,500 square feet (232 m<sup>2</sup>) shall have no fewer than two exit access doors from the care suite located in accordance with Section 1015.2.

**407.5 Smoke barriers.** Smoke barriers shall be provided to subdivide every story used by persons receiving care, treatment or sleeping and to divide other stories with an occupant load of 50 or more persons, into no fewer than two smoke compartments. Such stories shall be divided into smoke compartments with an area of not more than 22,500 square feet (2092 m<sup>2</sup>) and the travel distance from any point in a smoke compartment to a smoke barrier door shall be not greater than

200 feet (60 960 mm). The smoke barrier shall be in accordance with Section 709.

**Exceptions:**

1. This requirement shall not apply to Group I-2.1 less than 10,000 ft<sup>2</sup> (929 m<sup>2</sup>).
2. An area in an adjoining occupancy shall be permitted to serve as a smoke compartment for a Group I-2.1 facility if the following criteria are met:
  - 2.1. The separating wall and both compartments meet the requirements of 407.5.
  - 2.2. The Group I-2.1 is less than 22,500 ft<sup>2</sup> (2100 m<sup>2</sup>).
  - 2.3. Access from the Group I-2.1 to the other occupancy is unrestricted.

**407.5.1 Refuge area.** Refuge areas shall be provided within each smoke compartment. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining smoke compartment. Where a smoke compartment is adjoined by two or more smoke compartments, the minimum area of the refuge area shall accommodate the largest occupant load of the adjoining compartments. The size of the refuge area shall provide the following:

1. Not less than 30 net square feet (2.8 m<sup>2</sup>) for each care recipient confined to bed or litter.
2. Not less than 6 square feet (0.56 m<sup>2</sup>) for each ambulatory care recipient not confined to bed or litter and for other occupants.

Areas or spaces permitted to be included in the calculation of refuge area are corridors, sleeping areas, treatment rooms, lounge or dining areas and other low-hazard areas.

**407.5.2 Independent egress.** At least two means of egress shall be provided from each smoke compartment created by smoke barriers. Means of egress may pass through adjacent compartments provided it does not return through the smoke compartment from which means of egress originated.

**407.5.3 Horizontal assemblies.** Horizontal assemblies supporting smoke barriers required by this section shall be designed to resist the movement of smoke and shall comply with Section 711.9.

**[F] 407.6 Automatic sprinkler system.** Every facility as specified herein wherein more than six clients or patients are housed or cared for on the premises on a 24-hour per-day basis shall have installed and maintained in an operable condition in every building or portion thereof where clients or patients are housed, an automatic sprinkler system of a type approved by the state fire marshal. The provisions of this subsection shall apply to every person, firm or corporation establishing, maintaining or operating a hospital, children's home, children's nursery or institution, or a home or institution for the care of aged or persons with dementia or other

cognitive impairments, or any institution for persons with mental illness or persons with developmental disabilities and any nursing or convalescent home, and to any state-owned or state-occupied building used for any of the types of facilities specified herein.

**Exceptions:**

1. This section shall not apply to homes or institutions for the 24-hour-per-day care of ambulatory children if all of the following conditions are satisfied:
  - 1.1. The buildings or portions thereof in which children are housed are not more than two stories in height and are constructed and maintained in accordance with regulations adopted by the state fire marshal.
  - 1.2. The buildings or portions thereof housing more than six such children shall have installed and maintained in an operable condition therein, a fire alarm system of a type approved by the state fire marshal. Such system shall be activated by detectors responding to invisible particles of combustion other than heat, except that detectors used in closets, usable under-floor areas, storage rooms, bathrooms, attached garages, attics, plenums, laundry rooms and rooms of similar use, may be heat-responsive devices.
  - 1.3. The building or portions thereof do not house persons with mental illness or children with developmental disabilities.
2. This section shall not apply to any one-story building or structure of an institution or home for the care of the aged providing 24-hour-per-day care if such building or structure is used or intended to be used for the housing of no more than six ambulatory aged persons. Such buildings or institutions shall have installed and maintained in an operable condition herein a fire alarm system of a type approved by the state fire marshal. Such system shall be activated by detectors responding to either visible or invisible particles of combustion other than heat, except that detectors used in closets, usable under-floor areas, storage rooms, bathrooms, attached garages, attics, plenums, laundry rooms and rooms of similar use, may be heat-responsive devices.
3. This section shall not apply to occupancies or any alterations thereto conforming to the construction provisions of this exception which were under construction or in existence on March 4, 1972. "Under construction" as used in this exception shall mean that actual work had been performed on the construction site and shall not be construed to mean that the hospital, home, nursery, institution, sanitarium or any portion thereof, was or is in the planning stage. The provisions of this exception shall apply to those buildings or structures having bearing walls

and structural flame protected in accordance with the provisions of Column Type 1A of Table 601.

4. In detention facilities where inmates are not restrained.

The provisions of this section shall not apply to any facility used to house six or less persons on the premises.

**407.6.1** When a new addition is to be made to an unsprinklered building or structure as permitted by this subsection, such new addition shall be sprinklered as required by this section and shall be separated from the existing building or structures by not less than a two-hour fire-resistive fire barrier.

When a sprinkler system is added to an existing unsprinklered building or structure, the sprinklered area(s) shall be separated from the remainder of the building by not less than a one-hour fire-resistive fire barrier. The provisions of this section do not apply to any facility used to house six or less persons on the premises.

[F] **407.7 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.6.

[F] **407.8 Automatic fire detection.** See Section 907.2.6.2.

**407.9 Secured yards.** Grounds are permitted to be fenced and gates therein are permitted to be equipped with locks, provided that safe dispersal areas having 30 net square feet ( $2.8 \text{ m}^2$ ) for bed and litter care recipients and 6 net square feet ( $0.56 \text{ m}^2$ ) for ambulatory care recipients and other occupants are located between the building and the fence. Such provided safe dispersal area shall be located not less than 50 feet (15 240 mm) from the building they serve. *Each safe dispersal area shall have a minimum of two exits. The aggregate clear width of exits from a safe dispersal area shall be determined on the basis of not less than one exit unit of 22 inches (559 mm) for each 500 persons to be accommodated, and no exit shall be less than 44 inches (1118 mm) in width. Gates shall not be installed across corridors or passageways leading to such dispersal areas unless they comply with egress requirements. Keys to gate locks shall be provided in accordance with the California Fire Code.*

**407.10 Hyperbaric facilities.** Hyperbaric facilities in Group I-2 or I-2.1 occupancies shall meet the requirements contained in Chapter 20 of NFPA 99.

#### 407.11 Special Hazards.

**407.11.1 Storage and handling of flammable, combustible liquids and hazardous materials.** Storage and handling of flammable, combustible liquids and hazardous materials shall be in accordance with the California Fire Code.

**407.11.2 All exterior openings in a boiler room or room containing central heating equipment,** if located below openings in another story, or if less than 10 feet (3048 mm) from other doors or windows of the same building, shall be protected by a fire assembly having a three-fourths-hour fire protection rating.

**407.11.3 Safety padding.** See Sections 308.1 and 408.14.

**407.11.4 Floor Surfaces.** Rooms occupied by patients whose personal liberties are restrained shall have non-combustible floor surfaces see Sections 308.1 and 804.4.2.

## SECTION 408 GROUP I-3

**408.1 General.** Occupancies in Group I-3 shall comply with the provisions of Sections 408.1 through 408.11 and other applicable provisions of this code (see Section 308.5).

**408.1.1 Definitions.** The following terms are defined in Chapter 2:

**CELL.**

**CELL COMPLEX.**

**CELL TIERS.**

**CENTRAL CONTROL BUILDING.**

**COURTROOM DOCK.**

**COURTHOUSE HOLDING FACILITY.**

**DAY ROOM.**

**DETENTION ELEVATOR.**

**DETENTION TREATMENT ROOM.**

**DORMITORY.**

**HOLDING FACILITY.**

**HOUSING UNIT.**

**RESTRAINT.**

**SALLYPORT.**

**SMALL MANAGEMENT YARD.**

**SECURE INTERVIEW ROOMS.**

**TEMPORARY HOLDING CELL, ROOM OR AREA.**

**TEMPORARY HOLDING FACILITY.**

**408.1.2 Construction.** Group I-3 Occupancies shall be housed in buildings of Type IA or Type IB.

**Exception:** Such occupancies may be housed in one-story buildings of Type II A, Type III A or Type V A construction provided the floor area does not exceed 5,200 square feet ( $483\text{m}^2$ ) between fire walls of two-hour fire-resistive construction with openings protected by fire assemblies having 1- and  $1\frac{1}{2}$ -hour fire-protection rating.

**408.1.2.1 Nonbearing walls and partitions interior.** Nonbearing cell or dormitory walls within cell complexes shall be of noncombustible construction.

**408.1.2.2 Intervening spaces.** Common rooms and spaces within Group I-3 occupancies can be considered an intervening space in accordance with Section 1014.2, and not considered a corridor, when they meet any of the following:

1. The inmate and/or staff movement within cell complexes, medical housing wings and mental health housing wings of Type I construction.
2. Areas within any temporary holding area of non-combustible construction.
3. Areas within secure mental health treatment facilities of noncombustible construction.

**408.1.2.3 Courthouse holding facilities.** Group I-3 courthouse holding facilities shall be considered a separate and distinct building from the remaining courthouse building for the purpose of determining the type of construction where all of the following conditions are met:

1. 2-hour fire barriers in accordance with Section 707 and 2-hour horizontal assemblies in accor-

dance with Section 711 are provided to separate the courthouse holding facility from all other portions of the courthouse building.

2. Any of the structure used to support courthouse holding facilities meets the requirements for the Group I-3 portion of the building.
3. Each courthouse holding facility located above the first story is less than 1,000 square feet in area, and is designed to hold 10 or less in-custody defendants.
4. Courthouse holding facilities located above the first story containing an internal stairway discharging to the main courthouse holding facility at the first story or basement.
5. Additional exits from the courthouse holding facility located above the first story shall be permitted to exit through the courtrooms.
6. The main courthouse holding facility located on the first story or basement has at least one exit directly to the exterior and additional means of egress shall be permitted to pass through a 1-hour corridor or lobby in the courthouse building.

**408.1.2.4 Horizontal building separation for combined Group I-3/Group B occupancy.** A Group B Administration building one story in height shall be permitted to be located above a Group I-3 (or Group I-3/I-2) housing/treatment building that is one story above grade and shall be classified as a separate and distinct building for the purpose of determining the type of construction, and shall be considered a separate fire area, where all of the following conditions are met:

1. A 3-hour floor-ceiling assembly below the administration building is constructed as a horizontal assembly in accordance with Section 711.
2. Interior shafts for stairs, elevators and mechanical systems complete the 3-hour separation between the Group B and Group I-3 (or Group I-3/I-2).
3. The Group I-3 occupancy (or Group I-3/I-2 occupancies, correctional medical and mental health uses) below is minimum Type I-B construction with 2-hour fire resistive rated exterior walls.
4. No unprotected openings are allowed in lower roofs within 10 feet of unprotected windows in the upper floor.
5. The Group B building above is of noncombustible construction and equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
6. The Group B occupancy building above has all required means of egress capable of discharging directly to the exterior to a safe dispersal area.

**408.1.2.5 Temporary holding area.** In buildings protected with automatic sprinklers, corridor serving temporary holding rooms shall be one hour fire resistance

rated when the temporary holding occupant load is greater than 20.

**408.1.2.6 Temporary holding facilities.** Temporary holding facilities with nine or fewer persons under restraint may be classified as Group B when located in a buildings complying with all of the following conditions:

1. The building shall be protected throughout with a monitored automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. The building shall be protected with a automatic fire alarm system with notification appliances throughout the holding facility in accordance with Section 907.2.
3. The building shall be constructed of Type I, IIA, IIIA or VA construction.

**408.1.2.7 Secure interview rooms.** Secure Interview Rooms used for law enforcement shall be permitted to locked, and shall not be classified as Group I-3 occupancies where all of the following conditions are met:

1. A monitored automatic sprinkler system shall be provided throughout buildings and portions thereof including secure interview rooms. The automatic sprinkler system shall comply with Section 903.1.1.
2. Secure interview rooms shall be located in non-combustible construction.
3. Secure interview rooms have glazed or barred openings with direct, continuous observation from law enforcement personnel who have a means to open the secure interview room.
4. Not more than 6 occupants in secure interview rooms shall be located in the same fire area.
5. An automatic smoke detection system shall be installed within secure interview rooms and mechanical and electrical rooms.

**408.2 Other occupancies.** Buildings or portions of buildings in Group I-3 occupancies where security operations necessitate the locking of required means of egress shall be permitted to be classified as a different occupancy. Occupancies classified as other than Group I-3 shall meet the applicable requirements of this code for that occupancy provided provisions are made for the release of occupants at all times.

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

**Exception:**

1. It is permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a Group H use.

2. Regardless of the provisions of Section 508, laundry areas and kitchens including associated dining areas, where commercial/institutional equipment is used shall be separated from the remainder of the building by construction capable of resisting the passage of smoke.
3. For the purpose of occupancy separation only courtroom docks that are directly accessory to courtrooms need not be separated from a courtroom.

**408.2.1 Correctional medical and mental health uses.** Where a Group I-2 occupancy in accordance with Section 308.4 and a Group I-3 occupancy occur together in building or portions of buildings, the following Subsections of Sections of 407 shall apply: 407.2.1; 407.2.2; 407.2.3; 407.3.1; 407.3.1.1; 407.4; 407.10.

> **408.3 Means of egress.** Except as modified or as provided for in this section, the means of egress provisions of Chapter 10 shall apply.

**408.3.1 Door width.** Doors to resident sleeping units shall have a clear width of not less than 28 inches (711 mm).

**408.3.1.1 Cell doors shall open outwardly or slide laterally.**

**408.3.2 Sliding doors.** Where doors in a means of egress are of the horizontal-sliding type, the force to slide the door to its fully open position shall be not greater than 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).

**408.3.3 Guard tower doors.** A hatch or trap door not less than 16 square feet ( $610 \text{ m}^2$ ) in area through the floor and having dimensions of not less than 2 feet (610 mm) in any direction shall be permitted to be used as a portion of the means of egress from guard towers.

**408.3.4 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1009.12 are permitted for access to and between staff locations.

**408.3.5 Ship ladders.** Ship ladders shall be permitted for egress from control rooms or elevated facility observation rooms in accordance with Section 1009.14.

**408.3.6 Exit discharge.** Exits are permitted to discharge into a fenced or walled courtyard. Enclosed yards or courts shall be of a size to accommodate all occupants, be located not less than 50 feet (15 240 mm) from the building and have an area of not less than 15 square feet ( $1.4 \text{ m}^2$ ) per person.

#### **408.3.6 Exit discharge.**

**408.3.6.1** Exits are permitted to discharge into a fenced or walled courtyard. Enclosed yards or courts shall be of a size to accommodate all occupants, a minimum of 50 feet (15 240 mm) from the building with a net area of 3 square feet ( $1.4 \text{ m}^2$ ) per person. A gate shall be provided from the safe dispersal area to allow for the necessary relocation of occupants.

**408.3.6.2** Exterior fenced enclosures and fenced enclosures utilized for recreational or activity purposes,

used for exit termination for more than 20 persons, and which do not provide a safe dispersal area, shall have not less than two exits.

**408.3.6.3** Fenced enclosure utilized for recreational or activity purposes only, for more than 49 people, and which do not provide a safe dispersal area, shall be provided with not less than two exits.

**408.3.6.4** Fenced enclosures located on roofs of buildings one or more stories in height shall be provided with not less than two exits regardless of occupant load.

**408.3.6.5** Fenced enclosures utilized for central control buildings not normally occupied and not accessed by inmates or the general public are permitted to have only one exit from the fenced enclosure. These fenced enclosures shall only be occupied during emergency response conditions by not more than 29 prison staff occupants. Access to the fenced area shall be controlled remotely or at the gate with a key.

**408.3.7 Sallyports.** A sallyport shall be permitted in a means of egress where there are provisions for continuous and unobstructed passage through the sallyport during an emergency egress condition.

**408.3.8 Interior exit stairway and ramp construction.** One interior exit stairway or ramp in each building shall be permitted to have glazing installed in doors and interior walls at each landing level providing access to the interior exit stairway or ramp, provided that the following conditions are met:

1. The interior exit stairway or ramp shall not serve more than four floor levels.
2. Exit doors shall be not less than  $\frac{3}{4}$ -hour fire door assemblies complying with Section 716.5.
3. The total area of glazing at each floor level shall not exceed 5,000 square inches ( $3.2 \text{ m}^2$ ) and individual panels of glazing shall not exceed 1,296 square inches ( $0.84 \text{ m}^2$ ).
4. The glazing shall be protected on both sides by an automatic sprinkler system. The sprinkler system shall be designed to wet completely the entire surface of any glazing affected by fire when actuated.
5. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
6. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

**408.3.8.1** Where the number and arrangement of exits complies with the requirements of Chapter 10, other stairways which occur within the secure area of the detention facility and are not used for required exiting but are used primarily for the movement of inmates and security staff need not extend to the exterior.

**408.3.9 Dead-end balconies.** Exit balconies serving cell tiers shall not extend more than 50 feet (15 240 mm) beyond an exit stairway.

**408.3.10 Travel distance.** The travel distance may be increased to 300 feet for portions of Group I-3 occupancies open only to staff or where inmates are escorted at all times by staff.

**408.3.11 Number of exits required.** In temporary holding areas of noncombustible construction, a second means of egress is required when the occupant load is greater than 20.

**408.4 Locks.** Egress doors are permitted to be locked in accordance with the applicable use condition. Doors from a refuge area to the outside are permitted to be locked with a key in lieu of locking methods described in Section 408.4.1. The keys to unlock the exterior doors shall be available at all times and the locks shall be operable from both sides of the door. *Security hardware may be used on any fire-rated door.*

**408.4.1 Remote release.** Remote release of locks on doors in a means of egress shall be provided with reliable means of operation, remote from the resident living areas, to release locks on all required doors. In Occupancy Conditions 3 or 4, the arrangement, accessibility and security of the release mechanisms required for egress shall be such that with the minimum available staff at any time, the lock mechanisms are capable of being released within 2 minutes.

**Exception:** Provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required provided that not more than 10 locks are necessary to be unlocked in order to move occupants from one smoke compartment to a refuge area within 3 minutes. The opening of necessary locks shall be accomplished with not more than two separate keys.

**408.4.2 Power-operated doors and locks.** Power-operated sliding doors or power-operated locks for swinging doors shall be operable by a manual release mechanism at the door, and either emergency power or a remote mechanical operating release shall be provided.

**Exception:** Emergency power is not required in facilities with 10 or fewer locks complying with the exception to Section 408.4.1.

**408.4.3 Redundant operation.** Mechanically operated sliding doors or mechanically operated locks shall be provided with a mechanically operated release mechanism at each door and shall be provided with a remote release control.

**408.4.4 Relock capability.** Doors remotely unlocked under emergency conditions shall not automatically relock when closed unless specific action is taken at the remote location to enable doors to relock.

**408.5 Protection of vertical openings.** Any vertical opening shall be protected by a shaft enclosure in accordance with Section 713, or shall be in accordance with Section 408.5.1.

**408.5.1 Floor openings.** The open space in front of a cell tier and connected chases, not exceeding two tiers in

height, shall not be considered a vertical shaft and need not meet the fire-resistive shaft enclosure requirements of Section 713.

**408.5.2 Shaft openings in communicating floor levels.** Where a floor opening is permitted between communicating floor levels of a housing unit in accordance with Section 408.5.1, plumbing chases serving vertically staked individual cells contained with the housing unit shall be permitted without a shaft enclosure.

**408.6 Smoke barrier.** Occupancies in Group I-3 shall have smoke barriers complying with Sections 408.8 and 709 to divide every story occupied by residents for sleeping, or any other story having an occupant load of 50 or more persons, into no fewer than two smoke compartments.

**Exception:** Spaces having a direct exit to one of the following, provided that the locking arrangement of the doors involved complies with the requirements for doors at the smoke barrier for the use condition involved:

1. A public way.
2. A building separated from the resident housing area by a 2-hour fire-resistance-rated assembly or 50 feet (15 240 mm) of open space.
3. A secured yard or court having a holding space 50 feet (15 240 mm) from the housing area that provides 6 square feet (0.56 m<sup>2</sup>) or more of refuge area per occupant, including residents, staff and visitors.
4. Holding facility.

**408.6.1 Smoke compartments.** The number of residents in any smoke compartment shall be not more than 200. The travel distance to a door in a smoke barrier from any room door required as exit access shall be not greater than 150 feet (45 720 mm). The travel distance to a door in a smoke barrier from any point in a room shall be not greater than 200 feet (60 960 mm).

**Exception:** The travel distance may be increased by 50 feet from areas open only to the staff.

**408.6.2 Refuge area.** Not less than 6 net square feet (0.56 m<sup>2</sup>) per occupant shall be provided on each side of each smoke barrier for the total number of occupants in adjoining smoke compartments. This space shall be readily available wherever the occupants are moved across the smoke barrier in a fire emergency.

**408.6.3 Independent egress.** A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originates.

**408.7 Security glazing.** In occupancies in Group I-3, windows and doors in 1-hour fire barriers constructed in accordance with Section 707, fire partitions constructed in accordance with Section 708 and smoke barriers constructed in accordance with Section 709 shall be permitted to have security glazing installed provided that the following conditions are met.

1. Individual panels of glazing shall not exceed 1,296 square inches (0.84 m<sup>2</sup>).

2. The glazing shall be protected on both sides by an automatic sprinkler system. The sprinkler system shall be designed to, when actuated, wet completely the entire surface of any glazing affected by fire.
3. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
4. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

> **408.8 Subdivision of areas.** *Each cell complex shall be separated from other cell complexes or other spaces by a smoke-tight partition.*

**408.8.1 Smoke-tight doors.** Doors in openings in partitions required to be smoke tight by Section 408.8 shall be substantial doors, of construction that will resist the passage of smoke. Latches and door closures are not required on cell doors.

**408.9 Windowless buildings.** For the purposes of this section, a windowless building or portion of a building is one with nonopenable windows, windows not readily breakable or without windows.

**408.9.1 Smoke venting.** *Windowless buildings containing use conditions 3, 4 or 5 shall be provided with an engineered smoke control system in accordance with Section 909, windows or doors, smoke vents, or equivalent means to provide a tenable environment for exiting from the smoke compartment in the area of fire origin. If windows or doors are used to meet this section, at least two windows or doors to the exterior must be provided at or above the highest occupied level in each smoke compartment, and the windows or doors must be operable or readily breakable and arranged to manually vent smoke.*

**Exceptions:**

1. Local adult detention facilities, CDCR and CDCR mental health housing facilities shall be exempt from this section when they meet each of the following criteria:
  - 1.1. Are Type IA or IB construction
  - 1.2. Are protected with sprinklers throughout in accordance with Section 903.3.1.1
  - 1.3. Include a fire alarm system with smoke detection in accordance with NFPA 72 in the dayroom and/or corridor serving as exit access from the cells, reporting to a 24 hour central control at the institution
  - 1.4. Include at least one exit from each housing unit that discharges directly to the exterior
  - 1.5. The building is divided into at least two smoke compartments per Section 408.6.1
  - 1.6. Staffing in the institution is sufficient to evacuate inmates from the smoke compartment 24 hours per day, as approved by the enforcing agency or the facility is provided with gang or electric locks.

2. No venting or smoke control is required when an engineering analysis shows an acceptable safe egress time compared to the onset of untenable conditions within a windowless building or portion of a windowless building and approved by the enforcing agency.

[F] **408.10 Fire alarm system.** A fire alarm system shall be provided in accordance with Section 907.2.6.3.

[F] **408.11 Automatic sprinkler system.** Group I-3 occupancies shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.2.6.

**408.12 Emergency and standby power systems.** Special electrical systems, exit illumination, power installations and alternate on-site electrical supplies shall be provided for every building or portion of a building housing 10 or more inmates in a detention or correctional facility in accordance with the provisions of the California Electrical Code. There shall be a source of emergency power in all detention facilities capable of providing minimal lighting in all housing units, activity areas, corridors, stairs and central control points, and to maintain fire and life safety, security, communications and alarm systems.

**408.13 Windows.** *In security areas within cell complexes sprinklered throughout, the area of glazing in one-hour corridor walls and smoke barrier walls shall not be restricted, provided:*

1. All openings are protected by fixed glazing listed and labeled for a fire-protection of at least  $\frac{3}{4}$  hour; or
2. Fixed security glazing set in noncombustible frames. Shall comply with the minimum requirements of one of the following test standards: ASTM F 1233-98, Class III glass, or; California Department of Corrections, CDC 860-94d, or H.P. White Laboratory, Inc., HPW-TP-0500.02, Forced Entry Level III.
3. In lieu of the sizes set forth in CBC, the size and area of glazed assemblies shall conform to the following: Windows required to have a three-fourths-hour fire-resistant rating or windows protected by fixed security glazing, as delineated in Items 1 and 2 above, may have an area not greater than 84 square feet ( $7.8 \text{ m}^2$ ) with neither width nor height exceeding 12 feet (3658 mm).

**408.14 Safety padding.** Padding material used on walls, floors and ceilings in Group I and R-2.1 occupancies shall be of an approved type tested in accordance with the procedures established by State Fire Marshal Standard 12-8-100, Room Fire Test for Wall and Ceiling Materials, California Code of Regulations, Title 24, Part 12.

**408.15 Small management yards.**

**408.15.1 General.** The provisions of Sections 408.15.1 through 408.15.5 shall apply to small management yards. Small management yards may be used by a maximum of two occupants at any one time for a maximum of 2 hours per day.

**408.15.2 Construction.** Small management yards shall be constructed in accordance with all of the following:

1. Constructed of Type IB noncombustible materials.
2. Fence material shall be noncombustible.
3. Have a maximum area of 150 square feet ( $14 \text{ m}^2$ ).
4. Yard area covering shall not exceed 75 square feet ( $7 \text{ m}^2$ ) or a maximum of 50 percent of the fenced enclosure.
5. Electrical lighting or devices of any type shall not be permitted within the yard.

**Exception:** Low voltage devices dedicated for the operation of toilets.

**408.15.3 Fire protection system provisions.**

**408.15.3.1 Automatic sprinkler systems.** An automatic sprinkler system shall be provided in accordance with Section 903.3.1.1.

**Exception:** Small management yards where a distance of 10 feet (3048 mm) is maintained from all buildings or structures and 4 feet (1220 mm) is maintained from containment fencing.

**408.15.3.2 Fire alarm systems.** An approved fire alarm system shall be provided in accordance with Section 907.

**Exception:** Small management yards where a distance of 10 feet (3048 mm) is maintained from all buildings or structures and 4 feet (1220 mm) is maintained from containment fencing.

**408.15.4 Means of egress.** Except as modified or as provided for in this section, the provisions of Section 408.3 and Chapter 10 shall apply. Small management yards shall comply with all of the following:

1. Staff-controlled manual released locks shall be provided.
2. Staff escorting inmates to and from small management yards shall be equipped with radios and personal alarms to notify central control in case of a fire.
3. The safe dispersal area as defined by Section 1027.5 shall not be reduced due to placement of these yards.
4. An exit, remote from the main entrance is required in the containment fencing.

**408.15.5 Special provisions.** Inmate exercise clothing and toilet paper tissue shall be the only combustible materials permitted in small management yards.

## SECTION 409 MOTION PICTURE PROJECTION ROOMS

**409.1 General.** The provisions of Sections 409.1 through 409.5 shall apply to rooms in which ribbon-type cellulose acetate or other safety film is utilized in conjunction with electric arc, xenon or other light-source projection equipment that develops hazardous gases, dust or radiation. Where cellu-

lose nitrate film is utilized or stored, such rooms shall comply with NFPA 40.

**409.1.1 Projection room required.** Every motion picture machine projecting film as mentioned within the scope of this section shall be enclosed in a projection room. Appurtenant electrical equipment, such as rheostats, transformers and generators, shall be within the projection room or in an adjacent room of equivalent construction.

**409.2 Construction of projection rooms.** Every projection room shall be of permanent construction consistent with the construction requirements for the type of building in which the projection room is located. Openings are not required to be protected.

The room shall have a floor area of not less than 80 square feet ( $7.44 \text{ m}^2$ ) for a single machine and not less than 40 square feet ( $3.7 \text{ m}^2$ ) for each additional machine. Each motion picture projector, floodlight, spotlight or similar piece of equipment shall have a clear working space of not less than 30 inches by 30 inches (762 mm by 762 mm) on each side and at the rear thereof, but only one such space shall be required between two adjacent projectors. The projection room and the rooms appurtenant thereto shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). The aggregate of openings for projection equipment shall not exceed 25 percent of the area of the wall between the projection room and the auditorium. Openings shall be provided with glass or other approved material, so as to close completely the opening.

**409.3 Projection room and equipment ventilation.** Ventilation shall be provided in accordance with the *California Mechanical Code*.

**409.3.1 Supply air.** Each projection room shall be provided with adequate air supply inlets so arranged as to provide well-distributed air throughout the room. Air inlet ducts shall provide an amount of air equivalent to the amount of air being exhausted by projection equipment. Air is permitted to be taken from the outside; from adjacent spaces within the building, provided the volume and infiltration rate is sufficient; or from the building air-conditioning system, provided it is so arranged as to provide sufficient air when other systems are not in operation.

**409.3.2 Exhaust air.** Projection rooms are permitted to be exhausted through the lamp exhaust system. The lamp exhaust system shall be positively interconnected with the lamp so that the lamp will not operate unless there is the required airflow. Exhaust air ducts shall terminate at the exterior of the building in such a location that the exhaust air cannot be readily recirculated into any air supply system. The projection room ventilation system is permitted to also serve appurtenant rooms, such as the generator and rewind rooms.

**409.3.3 Projection machines.** Each projection machine shall be provided with an exhaust duct that will draw air from each lamp and exhaust it directly to the outside of the building. The lamp exhaust is permitted to serve to exhaust air from the projection room to provide room air circulation. Such ducts shall be of rigid materials, except for a flexible connector approved for the purpose. The pro-

jection lamp or projection room exhaust system, or both, is permitted to be combined but shall not be interconnected with any other exhaust or return system, or both, within the building.

**409.4 Lighting control.** Provisions shall be made for control of the auditorium lighting and the means of egress lighting systems of theaters from inside the projection room and from not less than one other convenient point in the building.

**409.5 Miscellaneous equipment.** Each projection room shall be provided with rewind and film storage facilities.

## SECTION 410 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS

**410.1 Applicability.** The provisions of Sections 410.1 through 410.8 shall apply to all parts of buildings and structures that contain stages or platforms and similar appurtelements as herein defined.

**410.2 Definitions.** The following terms are defined in Chapter 2:

**PLATFORM.**

**PROCENIUM WALL.**

**STAGE.**

**TECHNICAL PRODUCTION AREA.**

**410.3 Stages.** Stage construction shall comply with Sections 410.3.1 through 410.3.8.

**410.3.1 Stage construction.** Stages shall be constructed of materials as required for floors for the type of construction of the building in which such stages are located.

**Exception:** Stages need not be constructed of the same materials as required for the type of construction provided the construction complies with one of the following:

1. Stages of Type IIB or IV construction with a nominal 2-inch (51 mm) wood deck, provided that the stage is separated from other areas in accordance with Section 410.3.4.
2. In buildings of Type IIA, IIIA and VA construction, a fire-resistance-rated floor is not required, provided the space below the stage is equipped with an automatic sprinkler system or fire-extinguishing system in accordance with Section 903 or 904.
3. In all types of construction, the finished floor shall be constructed of wood or approved non-combustible materials. Openings through stage floors shall be equipped with tight-fitting, solid wood trap doors with approved safety locks.

**410.3.1.1 Stage height and area.** Stage areas shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. Stage height shall be measured from the low-

est point on the stage floor to the highest point of the roof or floor deck above the stage.

**410.3.2 Technical production areas: galleries, gridirons and catwalks.** Beams designed only for the attachment of portable or fixed theater equipment, gridirons, galleries and catwalks shall be constructed of approved materials consistent with the requirements for the type of construction of the building; and a fire-resistance rating shall not be required. These areas shall not be considered to be floors, stories, mezzanines or levels in applying this code.

**Exception:** Floors of fly galleries and catwalks shall be constructed of any approved material.

**410.3.3 Exterior stage doors.** Where protection of openings is required, exterior exit doors shall be protected with fire door assemblies that comply with Section 716. Exterior openings that are located on the stage for means of egress or loading and unloading purposes, and that are likely to be open during occupancy of the theater, shall be constructed with vestibules to prevent air drafts into the auditorium.

**410.3.4 Proscenium wall.** Where the stage height is greater than 50 feet (15 240 mm), all portions of the stage shall be completely separated from the seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof.

**410.3.5 Proscenium curtain.** Where a proscenium wall is required to have a fire-resistance rating, the stage opening shall be provided with a fire curtain complying with NFPA 80 or an approved water curtain complying with Section 903.3.1.1 or, in facilities not utilizing the provisions of smoke-protected assembly seating in accordance with Section 1028.6.2, a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level not less than 6 feet (1829 mm) above the floor of the means of egress.

**410.3.6 Scenery.** Combustible materials used in sets and scenery shall meet the fire propagation performance criteria of NFPA 701, in accordance with Section 806 and the *California Fire Code*. Foam plastics and materials containing foam plastics shall comply with Section 2603 and the *California Fire Code*.

**410.3.7 Stage ventilation.** Emergency ventilation shall be provided for stages larger than 1,000 square feet ( $93\text{ m}^2$ ) in floor area, or with a stage height greater than 50 feet (15 240 mm). Such ventilation shall comply with Section 410.3.7.1 or 410.3.7.2.

**410.3.7.1 Roof vents.** Two or more vents constructed to open automatically by approved heat-activated devices and with an aggregate clear opening area of not less than 5 percent of the area of the stage shall be located near the center and above the highest part of the stage area. Supplemental means shall be provided for manual operation of the ventilator. Curbs shall be provided as required for skylights in Section 2610.2. Vents shall be labeled.

**[F] 410.3.7.2 Smoke control.** Smoke control in accordance with Section 909 shall be provided to maintain the smoke layer interface not less than 6 feet (1829 mm) above the highest level of the assembly seating or above the top of the proscenium opening where a proscenium wall is provided in compliance with Section 410.3.4.

**410.4 Platform construction.** Permanent platforms shall be constructed of materials as required for the type of construction of the building in which the permanent platform is located. Permanent platforms are permitted to be constructed of fire-retardant-treated wood for Types I, II and IV construction where the platforms are not more than 30 inches (762 mm) above the main floor, and not more than one-third of the room floor area and not more than 3,000 square feet (279 m<sup>2</sup>) in area. Where the space beneath the permanent platform is used for storage or any purpose other than equipment, wiring or plumbing, the floor assembly shall be not less than 1-hour fire-resistance-rated construction. Where the space beneath the permanent platform is used only for equipment, wiring or plumbing, the underside of the permanent platform need not be protected.

**410.4.1 Temporary platforms.** Platforms installed for a period of not more than 30 days are permitted to be constructed of any materials permitted by the code. The space between the floor and the platform above shall only be used for plumbing and electrical wiring to platform equipment.

**410.5 Dressing and appurtenant rooms.** Dressing and appurtenant rooms shall comply with Sections 410.5.1 and 410.5.2.

**410.5.1 Separation from stage.** The stage shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the stage and other parts of the building by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall be not less than 2 hours for stage heights greater than 50 feet (15 240 mm) and not less than 1 hour for stage heights of 50 feet (15 240 mm) or less.

**410.5.2 Separation from each other.** Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the stage shall be separated from each other by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**410.6 Means of egress.** Except as modified or as provided for in this section, the provisions of Chapter 10 shall apply.

**410.6.1 Arrangement.** Where two or more exits or exit access doorways from the stage are required in accordance with Section 1015.1, no fewer than one exit or exit access doorway shall be provided on each side of a stage.

**410.6.2 Stairway and ramp enclosure.** Exit access stairways and ramps serving a stage or platform are not

required to be enclosed. Exit access stairways serving technical production areas are not required to be enclosed.

**410.6.3 Technical production areas.** Technical production areas shall be provided with means of egress and means of escape in accordance with Sections 410.6.3.1 through 410.6.3.5.

**410.6.3.1 Means of egress.** No fewer than one means of egress shall be provided from technical production areas.

**410.6.3.2 Travel distance.** The length of exit access travel shall be not greater than 300 feet (91 440 mm) for buildings without a sprinkler system and 400 feet (121 900 mm) for buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**410.6.3.3 Two means of egress.** Where two means of egress are required, the common path of travel shall be not greater than 100 feet (30 480 mm).

**Exception:** A means of escape to a roof in place of a second means of egress is permitted.

**410.6.3.4 Path of egress travel.** The following exit access components are permitted where serving technical production areas:

1. Stairways.
2. Ramps.
3. Spiral stairways.
4. Catwalks.
5. Alternating tread devices.
6. Permanent ladders.

**410.6.3.5 Width.** The path of egress travel within and from technical support areas shall be not less than 22 inches (559 mm).

**[F] 410.7 Automatic sprinkler system.** Stages shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

**Exceptions:**

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by not Type X gypsum board not less than  $\frac{5}{8}$ -inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m<sup>2</sup>) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

**[F] 410.8 Standpipes.** Standpipe systems shall be provided in accordance with Section 905.

## SECTION 411 SPECIAL AMUSEMENT BUILDINGS

**411.1 General.** Special amusement buildings having an occupant load of 50 or more shall comply with the requirements for the appropriate Group A occupancy and Sections 411.1 through 411.8. Amusement buildings having an occupant load of less than 50 shall comply with the requirements for a Group B occupancy and Sections 411.1 through 411.8.

**Exception:** Amusement buildings or portions thereof that are without walls or a roof and constructed to prevent the accumulation of smoke need not comply with this section.

For flammable decorative materials, see the *California Fire Code*.

**411.2 Definition.** The following term is defined in Chapter 2:

### SPECIAL AMUSEMENT BUILDING.

**[F] 411.3 Automatic fire detection.** Special amusement buildings shall be equipped with an automatic fire detection system in accordance with Section 907.

**[F] 411.4 Automatic sprinkler system.** Special amusement buildings shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement building is temporary, the sprinkler water supply shall be of an approved temporary means.

**Exception:** Automatic sprinklers are not required where the total floor area of a temporary special amusement building is less than 1,000 square feet ( $93 \text{ m}^2$ ) and the travel distance from any point to an exit is less than 50 feet (15 240 mm).

**[F] 411.5 Alarm.** Actuation of a single smoke detector, the automatic sprinkler system or other automatic fire detection device shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated including the capability of manual initiation of requirements in Section 907.2.12.2.

**[F] 411.6 Emergency voice/alarm communications system.** An emergency voice/alarm communications system shall be provided in accordance with Sections 907.2.12 and 907.5.2.2, which is also permitted to serve as a public address system and shall be audible throughout the entire special amusement building.

**411.7 Exit marking.** Exit signs shall be installed at the required exit or exit access doorways of amusement buildings in accordance with this section and Section 1011. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.5, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path

of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.12.2.

**411.7.1 Photo luminescent exit signs.** Where photo luminescent exit signs are installed, activating light source and viewing distance shall be in accordance with the listing and markings of the signs.

**411.8 Interior finish.** The interior finish shall be Class A in accordance with Section 803.1.

## SECTION 412 AIRCRAFT-RELATED OCCUPANCIES

**412.1 General.** Aircraft-related occupancies shall comply with Sections 412.1 through 412.7 and the *California Fire Code*.

**412.2 Definitions.** The following terms are defined in Chapter 2:

### FIXED BASE OPERATOR (FBO).

### HELIPORT.

### HELISTOP.

### RESIDENTIAL AIRCRAFT HANGAR.

### TRANSIENT AIRCRAFT.

**412.3 Airport traffic control towers.** The provisions of Sections 412.3.1 through 412.3.5 shall apply to airport traffic control towers not exceeding 1,500 square feet ( $140 \text{ m}^2$ ) per floor occupied only for the following uses:

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.

**412.3.1 Type of construction.** Airport traffic control towers shall be constructed to comply with the height and area limitations of Table 412.3.2.

**TABLE 412.3.1  
HEIGHT AND AREA LIMITATIONS FOR AIRPORT TRAFFIC  
CONTROL TOWERS**

TYPE OF CONSTRUCTION	HEIGHT <sup>a</sup> (feet)	MAXIMUM AREA (square feet)
IA	Unlimited	1,500
IB	240	1,500
IIA	100	1,500
IIB	85	1,500
IIIA	65	1,500

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

a. Height to be measured from grade plane to cab floor.

**412.3.2 Egress.** Not less than one exit stairway shall be permitted for airport traffic control towers of any height provided that the occupant load per floor is not greater than 15. The stairway shall conform to the requirements of Section 1009. The stairway shall be separated from ele-

vators by a distance of not less than one-half of the diagonal of the area served measured in a straight line. The exit stairway and elevator hoistway are permitted to be located in the same shaft enclosure, provided they are separated from each other by a 4-hour fire barrier having no openings. Such stairway shall be pressurized to not less than 0.15 inch of water column (43 Pa) and not greater than 0.35 inch of water column (101 Pa) in the shaft relative to the building with stairway doors closed. Stairways need not extend to the roof as specified in Section 1009.16. The provisions of Section 403 do not apply.

**Exception:** Smokeproof enclosures as set forth in Section 1022.10 are not required where required stairways are pressurized.

**[F] 412.3.3 Automatic fire detection systems.** Airport traffic control towers shall be provided with an automatic fire detection system installed in accordance with Section 907.2.

**[F] 412.3.4 Standby power.** A standby power system that conforms to Chapter 27 shall be provided in airport traffic control towers more than 65 feet (19 812 mm) in height. Power shall be provided to the following equipment:

1. Pressurization equipment, mechanical equipment and lighting.
2. Elevator operating equipment.
3. Fire alarm and smoke detection systems.

**412.3.5 Accessibility.** *[DSA-AC] In air traffic control towers, an accessible route shall not be required to serve the cab and the equipment areas on the floor immediately below the cab.*

**412.4 Aircraft hangars.** Aircraft hangars shall be in accordance with Sections 412.4.1 through 412.4.6.

**412.4.1 Exterior walls.** Exterior walls located less than 30 feet (9144 mm) from lot lines or a public way shall have a fire-resistance rating not less than 2 hours.

**412.4.2 Basements.** Where hangars have basements, floors over basements shall be of Type IA construction and shall be made tight against seepage of water, oil or vapors. There shall be no opening or communication between basements and the hangar. Access to basements shall be from outside only.

**412.4.3 Floor surface.** Floors shall be graded and drained to prevent water or fuel from remaining on the floor. Floor drains shall discharge through an oil separator to the sewer or to an outside vented sump.

**Exception:** Aircraft hangars with individual lease spaces not exceeding 2,000 square feet (186 m<sup>2</sup>) each in which servicing, repairing or washing is not conducted and fuel is not dispensed shall have floors that are graded toward the door, but shall not require a separator.

**412.4.4 Heating equipment.** Heating equipment shall be placed in another room separated by 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or

both. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

#### Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended not less than 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar need not be located in a separate room provided they are mounted not less than 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. Entrance to the separated room shall be permitted by a single interior door provided the sources of ignition in the appliances are not less than 18 inches (457 mm) above the floor.

**412.4.5 Finishing.** The process of "doping," involving use of a volatile flammable solvent, or of painting, shall be carried on in a separate detached building equipped with automatic fire-extinguishing equipment in accordance with Section 903.

**[F] 412.4.6 Fire suppression.** Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based upon the classification for the hangar given in Table 412.4.6.

**Exception:** Where a fixed base operator has separate repair facilities on site, Group II hangars operated by a fixed base operator used for storage of transient aircraft only shall have a fire suppression system, but the system is exempt from foam requirements.

**[F] 412.4.6.1 Hazardous operations.** Any Group III aircraft hangar according to Table 412.4.6 that contains hazardous operations including, but not limited to, the following shall be provided with a Group I or II fire suppression system in accordance with NFPA 409 as applicable:

1. Doping.
2. Hot work including, but not limited to, welding, torch cutting and torch soldering.
3. Fuel transfer.
4. Fuel tank repair or maintenance not including defueled tanks in accordance with NFPA 409, inerted tanks or tanks that have never been fueled.
5. Spray finishing operations.
6. Total fuel capacity of all aircraft within the unsprinklered single fire area in excess of 1,600 gallons (6057 L).
7. Total fuel capacity of all aircraft within the maximum single fire area in excess of 7,500 gallons (28 390 L) for a hangar with an automatic sprinkler system in accordance with Section 903.3.1.1.

**[F] TABLE 412.4.6**  
**HANGAR FIRE SUPPRESSION REQUIREMENTS<sup>a,b,c</sup>**

MAXIMUM SINGLE FIRE AREA (square feet)	TYPE OF CONSTRUCTION								
	IA	IB	IIA	IIB	III A	IIIB	IV	V A	VB
≥ 40,001	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I
40,000	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II
30,000	Group III	Group II							
20,000	Group III	Group III	Group II						
15,000	Group III	Group III	Group III	Group II	Group III	Group II	Group III	Group II	Group II
12,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II	Group II
8,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II
5,000	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

- a. Aircraft hangars with a door height greater than 28 feet shall be provided with fire suppression for a Group I hangar regardless of maximum fire area.
- b. Groups shall be as classified in accordance with NFPA 409.
- c. Membrane structures complying with Section 3102 shall be classified as a Group IV hangar.

**[F] 412.4.6.2 Separation of maximum single fire areas.** Maximum single fire areas established in accordance with hangar classification and construction type in Table 412.4.6 shall be separated by 2-hour fire walls constructed in accordance with Section 706. In determining the maximum single fire area as set forth in Table 412.4.6, ancillary uses which are separated from aircraft servicing areas by a fire barrier of not less than one hour, constructed in accordance with Section 707 shall not be included in the area.

**412.5 Residential aircraft hangars.** Residential aircraft hangars shall comply with Sections 412.5.1 through 412.5.5.

**412.5.1 Fire separation.** A hangar shall not be attached to a dwelling unless separated by a fire barrier having a fire-resistance rating of not less than 1 hour. Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the dwelling unit. Doors into the dwelling unit shall be equipped with self-closing devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hanger directly into a room used for sleeping purposes shall not be permitted.

**412.5.2 Egress.** A hangar shall provide two means of egress. One of the doors into the dwelling shall be considered as meeting only one of the two means of egress.

**[F] 412.5.3 Smoke alarms.** Smoke alarms shall be provided within the hangar in accordance with Section 907.2.21.

**412.5.4 Independent systems.** Electrical, mechanical and plumbing drain, waste and vent (DWV) systems installed within the hangar shall be independent of the systems installed within the dwelling. Building sewer lines shall be permitted to be connected outside the structures.

**Exception:** Smoke detector wiring and feed for electrical subpanels in the hangar.

**412.5.5 Height and area limits.** Residential aircraft hangars shall be not greater than 2,000 square feet (186 m<sup>2</sup>) in area and 20 feet (6096 mm) in building height.

**[F] 412.6 Aircraft paint hangars.** Aircraft painting operations where flammable liquids are used in excess of the maximum allowable quantities per control area listed in Table 307.1(1) shall be conducted in an aircraft paint hangar that complies with the provisions of Sections 412.6.1 through 412.6.6.

**[F] 412.6.1 Occupancy group.** Aircraft paint hangars shall be classified as Group H-2. Aircraft paint hangars shall comply with the applicable requirements of this code and the *California Fire Code* for such occupancy.

**412.6.2 Construction.** The aircraft paint hangar shall be of Type I or II construction.

**[F] 412.6.3 Operations.** Only those flammable liquids necessary for painting operations shall be permitted in quantities less than the maximum allowable quantities per control area in Table 307.1(1). Spray equipment cleaning operations shall be conducted in a liquid use, dispensing and mixing room.

**[F] 412.6.4 Storage.** Storage of flammable liquids shall be in a liquid storage room.

**[F] 412.6.5 Fire suppression.** Aircraft paint hangars shall be provided with fire suppression as required by NFPA 409.

**[F] 412.6.6 Ventilation.** Aircraft paint hangars shall be provided with ventilation as required in the *California Mechanical Code*.

**[F] 412.7 Heliports and helistops.** Heliports and helistops shall be permitted to be erected on buildings or other locations where they are constructed in accordance with Sections 412.7.1 through 412.7.5.

**[F] 412.7.1 Size.** The landing area for helicopters less than 3,500 pounds (1588 kg) shall be not less than 20 feet (6096 mm) in length and width. The landing area shall be

surrounded on all sides by a clear area having a minimum average width at roof level of 15 feet (4572 mm) but with no width less than 5 feet (1524 mm).

**[F] 412.7.2 Design.** Helicopter landing areas and the supports thereof on the roof of a building shall be noncombustible construction. Landing areas shall be designed to confine any flammable liquid spillage to the landing area itself and provisions shall be made to drain such spillage away from any exit or stairway serving the helicopter landing area or from a structure housing such exit or stairway. For structural design requirements, see Section 1605.4.

**[F] 412.7.3 Means of egress.** The means of egress from heliports and helistops shall comply with the provisions of Chapter 10. Landing areas located on buildings or structures shall have two or more means of egress. For landing areas less than 60 feet (18 288 mm) in length or less than 2,000 square feet (186 m<sup>2</sup>) in area, the second means of egress is permitted to be a fire escape, alternating tread device or ladder leading to the floor below.

**[F] 412.7.4 Rooftop heliports and helistops.** Rooftop heliports and helistops shall comply with NFPA 418.

**[F] 412.7.5 Standpipe system.** In buildings equipped with a standpipe system, the standpipe shall extend to the roof level in accordance with Section 905.3.6.

## SECTION 413 COMBUSTIBLE STORAGE

**413.1 General.** High-piled stock or rack storage in any occupancy group shall comply with the *California Fire Code*.

**413.2 Attic, under-floor and concealed spaces.** Attic, under-floor and concealed spaces used for storage of combustible materials shall be protected on the storage side as required for 1-hour fire-resistance-rated construction. Openings shall be protected by assemblies that are self-closing and are of noncombustible construction or solid wood core not less than 1<sup>3</sup>/<sub>4</sub> inch (45 mm) in thickness.

**Exception:** Neither fire resistant construction nor open protectives are required in any of the following locations:

1. Areas protected by approved automatic sprinkler systems.
2. Group R-3 and U occupancies.

## SECTION 414 HAZARDOUS MATERIALS

**[F] 414.1 General.** The provisions of Sections 414.1 through 414.7 shall apply to buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of hazardous materials.

**[F] 414.1.1 Other provisions.** Buildings and structures with an occupancy in Group H shall comply with this section and the applicable provisions of Section 415 and the *California Fire Code*. For Group L occupancies see Section 443.

**[F] 414.1.2 Materials.** The safe design of hazardous material occupancies is material dependent. Individual material

requirements are also found in Sections 307 and 415, and in the *California Mechanical Code* and the *California Fire Code*.

**[F] 414.1.2.1 Aerosols.** Level 2 and 3 aerosol products shall be stored and displayed in accordance with the *California Fire Code*. See Section 311.2 and the *California Fire Code* for occupancy group requirements.

**[F] 414.1.3 Information required.** A report shall be submitted to the building official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous material classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and provided without charge to the enforcing agency.

For buildings and structures with an occupancy in Group H, separate floor plans shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure.

**[F] 414.2 Control areas.** Control areas shall comply with Sections 414.2.1 through 414.2.5 and the *California Fire Code*.

**[F] 414.2.1 Construction requirements.** Control areas shall be separated from each other by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**[F] 414.2.2 Percentage of maximum allowable quantities.** The percentage of maximum allowable quantities of hazardous materials per control area permitted at each floor level within a building shall be in accordance with Table 414.2.2.

**[F] 414.2.3 Number.** The maximum number of control areas within a building shall be in accordance with Table 414.2.2.

**[F] 414.2.4 Fire-resistance-rating requirements.** The required fire-resistance rating for fire barriers shall be in accordance with Table 414.2.2. The floor assembly of the control area and the construction supporting the floor of the control area shall have a fire-resistance rating of not less than 2 hours.

**Exception:** The floor assembly of the control area and the construction supporting the floor of the control area are allowed to be 1-hour fire-resistance rated in buildings of Types IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1; and
2. The building is three or fewer stories above grade plane.

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**[F] TABLE 414.2.2**  
**DESIGN AND NUMBER OF CONTROL AREAS**

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA <sup>a</sup>	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS <sup>b</sup>
Above grade plane	Higher than 9	5	1	2
	7-9	5	2	2
	6	12.5	2	2
	5	12.5	2	2
	4	12.5	2	2
	3	50	2	1
	2	75	3	1
	1	100	4	1
Below grade plane	1	75	3	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 notes to those tables.

b. Separation shall include fire barriers and horizontal assemblies as necessary to provide separation from other portions of the building.

**[F] 414.2.5 Hazardous material in Group M display and storage areas and in Group S storage areas.** The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials permitted within a single control area of a Group M display and storage area, a Group S storage area or an outdoor control area is permitted to exceed the maximum allowable quantities per control area specified in Tables 307.1(1) and 307.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with the *California Fire Code* and quantities do not exceed the maximum allowable specified in Table 414.2.5(1).

In Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area as indicated in Table 414.2.5(2), provided that the materials are displayed and stored in accordance with the *California Fire Code*.

The maximum quantity of aerosol products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the *California Fire Code*.

**[F] 414.3 Ventilation.** Rooms, areas or spaces of Group H in which explosive, corrosive, combustible, flammable or highly toxic dusts, mists, fumes, vapors or gases are or may be emitted due to the processing, use, handling or storage of materials shall be mechanically ventilated as required by the *California Fire Code* and the *California Mechanical Code*.

Ducts conveying explosives or flammable vapors, fumes or dusts shall extend directly to the exterior of the building without entering other spaces. Exhaust ducts shall not extend into or through ducts and plenums.

**Exception:** Ducts conveying vapor or fumes having flammable constituents less than 25 percent of their lower flammable limit (LFL) are permitted to pass through other spaces.

Emissions generated at workstations shall be confined to the area in which they are generated as specified in the *California Fire Code* and the *California Mechanical Code*.

The location of supply and exhaust openings shall be in accordance with the *California Mechanical Code*. Exhaust air contaminated by highly toxic material shall be treated in accordance with the *California Fire Code*.

A manual shutoff control for ventilation equipment required by this section shall be provided outside the room adjacent to the principal access door to the room. The switch shall be of the break-glass type and shall be labeled: VENTILATION SYSTEM EMERGENCY SHUTOFF.

**[F] 414.4 Hazardous material systems.** Systems involving hazardous materials shall be suitable for the intended application. Controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls, where provided, shall be designed to be fail safe.

**[F] 414.5 Inside storage, dispensing and use.** The inside storage, dispensing and use of hazardous materials shall be in accordance with Sections 414.5.1 through 414.5.4 of this code and the *California Fire Code*.

**[F] 414.5.1 Explosion control.** Explosion control shall be provided in accordance with the *California Fire Code* as required by Table 414.5.1 where quantities of hazardous materials specified in that table exceed the maximum allowable quantities in Table 307.1(1) or where a structure, room or space is occupied for purposes involving explosion hazards as required by Section 415 or the *California Fire Code*.

**[F] 414.5.2 Monitor control equipment.** Monitor control equipment shall be provided where required by the *California Fire Code*.

**[F] 414.5.3 Emergency or standby power.** Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required by the *California Fire Code* or this code,

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

**[F] TABLE 414.2.5(1)**  
**MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES**  
**NONFLAMMABLE SOLIDS AND NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS<sup>d,e,f</sup>**

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material <sup>a</sup>	Class	Solids pounds	Liquids gallons
<b>A. Health-hazard materials—nonflammable and noncombustible solids and liquids</b>			
1. Corrosives <sup>b,c</sup>	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20 <sup>b,c</sup>	2 <sup>b,c</sup>
3. Toxics <sup>b,c</sup>	Not Applicable	1,000	100
<b>B. Physical-hazard materials—nonflammable and noncombustible solids and liquids</b>			
1. Oxidizers <sup>b,c</sup>	4	Not Allowed	Not Allowed
	3	1,150 <sup>g</sup>	115
	2	2,250 <sup>h</sup>	225
	1	18,000 <sup>i,j</sup>	1,800 <sup>i,j</sup>
2. Unstable (reactives) <sup>b,c</sup>	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water reactives	3 <sup>b,c</sup>	550	55
	2 <sup>b,c</sup>	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L.

- a. Hazard categories are as specified in the *California Fire Code*.
- b. Maximum allowable quantities shall be increased 100 percent in buildings that are sprinklered in accordance with Section 903.3.1.1. When Note c also applies, the increase for both notes shall be applied accumulatively.
- c. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, in accordance with the *California Fire Code*. When Note b also applies, the increase for both notes shall be applied accumulatively.
- d. See Table 414.2.2 for design and number of control areas.
- e. Allowable quantities for other hazardous material categories shall be in accordance with Section 307.
- f. Maximum quantities shall be increased 100 percent in outdoor control areas.
- g. Maximum amounts are permitted to be increased to 2,250 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
- h. Maximum amounts are permitted to be increased to 4,500 pounds when individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
- i. The permitted quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- j. Quantities are unlimited in an outdoor control area.

such systems shall be provided with an emergency or standby power system in accordance with Chapter 27.

**Exceptions:**

1. Emergency or standby power are not required for the following storage areas:
  - 1.1. Mechanical ventilation for storage of Class IB and Class IC flammable and combustible liquids in closed containers not exceeding 6.5 gallons (25 L) capacity.
  - 1.2. Storage areas for Class 1 and 2 oxidizers.
  - 1.3. Storage areas for Class II, III, IV and V organic peroxides.
  - 1.4. Storage, use and handling areas for asphyxiant, irritant and radioactive gases.

1.5. For storage, use and handling areas for highly toxic or toxic materials, see Sections 6004.2.2.8 and 6004.3.4.2 of the *California Fire Code*.

2. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

**[F] 414.5.4 Spill control, drainage and containment.** Rooms, buildings or areas occupied for the storage of solid and liquid hazardous materials shall be provided with a means to control spillage and to contain or drain off spillage and fire protection water discharged in the storage area where required in the *California Fire Code*. The methods of spill control shall be in accordance with the *California Fire Code*.

**[F] TABLE 414.2.5(2)**  
**MAXIMUM ALLOWABLE QUANTITY OF FLAMMABLE AND COMBUSTIBLE**  
**LIQUIDS IN WHOLESALE AND RETAIL SALES OCCUPANCIES PER CONTROL AREA<sup>a</sup>**

TYPE OF LIQUID	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA (gallons)		
	Sprinklered in accordance with note b densities and arrangements	Sprinklered in accordance with Tables 3404.3.6.3(4) through 3404.3.6.3(8) and Table 3404.3.7.5.1 of the California Fire Code	Nonsprinklered
Class IA	60	60	30
Class IB, IC, II and IIIA	7,500 <sup>c</sup>	15,000 <sup>c</sup>	1,600
Class IIIB	Unlimited	Unlimited	13,200

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon = 3.785 L, 1 gallon per minute per square foot = 40.75 L/min/m<sup>2</sup>.

- a. Control areas shall be separated from each other by not less than a 1-hour fire barrier wall.  
 b. To be considered as sprinklered, a building shall be equipped throughout with an approved automatic sprinkler system with a design providing minimum densities as follows:

1. For uncartoned commodities on shelves 6 feet or less in height where the ceiling height does not exceed 18 feet, quantities are those permitted with a minimum sprinkler design density of Ordinary Hazard Group 2.
2. For cartoned, palletized or racked commodities where storage is 4 feet 6 inches or less in height and where the ceiling height does not exceed 18 feet, quantities are those permitted with a minimum sprinkler design density of 0.21 gallon per minute per square foot over the most remote 1,500-square-foot area.
- c. Where wholesale and retail sales or storage areas exceed 50,000 square feet in area, the maximum allowable quantities are allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to a maximum of 100 percent of the table amounts. A control area separation is not required. The cumulative amounts, including amounts attained by having an additional control area, shall not exceed 30,000 gallons.

**414.5.5 Hazardous material handling.** The handling of hazardous materials shall be in accordance with California Fire Code Section 2705.

**[F] 414.6 Outdoor storage, dispensing and use.** The outdoor storage, dispensing and use of hazardous materials shall be in accordance with the California Fire Code.

**[F] 414.6.1 Weather protection.** Where weather protection is provided for sheltering outdoor hazardous material storage or use areas, such areas shall be considered outdoor storage or use when the weather protection structure complies with Sections 414.6.1.1 through 414.6.1.3.

**[F] 414.6.1.1 Walls.** Walls shall not obstruct more than one side of the structure.

**Exception:** Walls shall be permitted to obstruct portions of multiple sides of the structure, provided that the obstructed area is not greater than 25 percent of the structure's perimeter.

**[F] 414.6.1.2 Separation distance.** The distance from the structure to buildings, lot lines, public ways or means of egress to a public way shall be not less than the distance required for an outside hazardous material storage or use area without weather protection.

**[F] 414.6.1.3 Noncombustible construction.** The overhead structure shall be of approved noncombustible construction with a maximum area of 1,500 square feet (140 m<sup>2</sup>).

**Exception:** The maximum area is permitted to be increased as provided by Section 506.

**[F] 414.7 Emergency alarms.** Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as set forth herein.

**[F] 414.7.1 Storage.** An approved manual emergency alarm system shall be provided in buildings, rooms or

areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials.

**[F] 414.7.2 Dispensing, use and handling.** Where hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 are transported through corridors, interior exit stairways or ramps, or exit passageways there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals and at each exit and exit access doorway throughout the transport route. The signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall initiate a local audible alarm.

**[F] 414.7.3 Supervision.** Emergency alarm systems shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

## SECTION 415 GROUPS H-1, H-2, H-3, H-4 AND H-5

*Section 415 has been completely reorganized from the 2009 code; therefore, the \* and \*\* margin indicators have not been included for clarity.*

**[F] 415.1 Scope.** The provisions of Sections 415.1 through 415.10 shall apply to the storage and use of hazardous materials in excess of the maximum allowable quantities per control area listed in Section 307.1. Buildings and structures with an occupancy in Group H shall also comply with the applicable provisions of Section 414 and the California Fire Code.

**SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY**

**[F] TABLE 414.5.1  
EXPLOSION CONTROL REQUIREMENTS<sup>a</sup>**

<b>MATERIAL</b>	<b>CLASS</b>	<b>EXPLOSION CONTROL METHODS</b>	
		<b>Barricade construction</b>	<b>Explosion (deflagration) venting or explosion (deflagration) prevention systems<sup>b</sup></b>
<b>HAZARD CATEGORY</b>			
Combustible dusts <sup>c</sup>	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous Liquefied	Not Required Not Required	Required Required
Flammable liquid	IA <sup>d</sup> IB <sup>e</sup>	Not Required Not Required	Required Required
Organic peroxides	U I	Required Required	Not Permitted Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2 <sup>g</sup>	Not Required	Required
<b>SPECIAL USES</b>			
Acetylene generator rooms	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist <sup>f</sup>	Detonation Deflagration	Required Not Required	Not Permitted Required

a. See Section 414.1.3.

b. See the *California Fire Code*.

c. As generated during manufacturing or processing.

d. Storage or use.

e. In open use or dispensing.

f. Rooms containing dispensing and use of hazardous materials when an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

g. A method of explosion control shall be provided when Class 2 water-reactive materials can form potentially explosive mixtures.

**[F] 415.2 Definitions.** The following terms are defined in Chapter 2:

**CONTINUOUS GAS DETECTION SYSTEM.**

**DETACHED BUILDING.**

**EMERGENCY CONTROL STATION.**

**EXHAUSTED ENCLOSURE.**

**FABRICATION AREA.**

**FLAMMABLE VAPORS OR FUMES.**

**GAS CABINET.**

**GASROOM.**

**HAZARDOUS PRODUCTION MATERIAL (HPM).**

**HPM FLAMMABLE LIQUID.**

**HPM ROOM.**

**IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).**

**LIQUID.**

**LIQUID STORAGE ROOM.**

**LIQUID USE, DISPENSING AND MIXING ROOM.**

**LOWER FLAMMABLE LIMIT (LFL).****NORMAL TEMPERATURE AND PRESSURE (NTP).****PHYSIOLOGICAL WARNING THRESHOLD LEVEL.****SERVICE CORRIDOR.****SOLID.****STORAGE, HAZARDOUS MATERIALS.****USE (MATERIAL).****WORKSTATION.**

**[F] 415.3 Automatic fire detection systems.** Group H occupancies shall be provided with an automatic fire detection system in accordance with Section 907.2.

**[F] 415.4 Automatic sprinkler system.** Group H occupancies shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.

**[F] 415.5 Fire separation distance.** Group H occupancies shall be located on property in accordance with the other provisions of this chapter. In Groups H-2 and H-3, not less than 25 percent of the perimeter wall of the occupancy shall be an exterior wall.

**Exceptions:**

1. Liquid use, dispensing and mixing rooms having a floor area of not more than 500 square feet ( $46.5 \text{ m}^2$ ) need not be located on the outer perimeter of the building where they are in accordance with the *California Fire Code* and NFPA 30.
2. Liquid storage rooms having a floor area of not more than 1,000 square feet ( $93 \text{ m}^2$ ) need not be located on the outer perimeter where they are in accordance with the *California Fire Code* and NFPA 30.
3. Spray paint booths that comply with the *California Fire Code* need not be located on the outer perimeter.

**[F] 415.5.1 Group H occupancy minimum fire separation distance.** Regardless of any other provisions, buildings containing Group H occupancies shall be set back to the minimum fire separation distance as set forth in Sections 415.5.1.1 through 415.5.1.4. Distances shall be measured from the walls enclosing the occupancy to lot lines, including those on a public way. Distances to assumed lot lines established for the purpose of determining exterior wall and opening protection are not to be used to establish the minimum fire separation distance for buildings on sites where explosives are manufactured or used when separation is provided in accordance with the quantity distance tables specified for explosive materials in the *California Fire Code*.

**[F] 415.5.1.1 Group H-1.** Group H-1 occupancies shall be set back not less than 75 feet (22 860 mm) and not less than required by the *California Fire Code*.

**Exception:** Fireworks manufacturing buildings separated in accordance with NFPA 1124.

**[F] 415.5.1.2 Group H-2.** Group H-2 occupancies shall be set back not less than 30 feet (9144 mm) where the area of the occupancy is greater than 1,000 square feet ( $93 \text{ m}^2$ ) and it is not required to be located in a detached building.

**[F] 415.5.1.3 Groups H-2 and H-3.** Group H-2 and H-3 occupancies shall be set back not less than 50 feet (15 240 mm) where a detached building is required (see Table 415.5.2). ||

**[F] 415.5.1.4 Explosive materials.** Group H-2 and H-3 occupancies containing materials with explosive characteristics shall be separated as required by the *California Fire Code*. Where separations are not specified, the distances required shall be determined by a technical report issued in accordance with Section 414.1.3.

**[F] 415.5.2 Detached buildings for Group H-1, H-2 or H-3 occupancy.** The storage or use of hazardous materials in excess of those amounts listed in Table 415.5.2 shall be in accordance with the applicable provisions of Sections 415.6 and 415.7.

**[F] 415.5.2.1 Wall and opening protection.** Where a detached building is required by Table 415.5.2, there are no requirements for wall and opening protection based on fire separation distance.

**[F] 415.6 Special provisions for Group H-1 occupancies.** Group H-1 occupancies shall be in buildings used for no other purpose, shall not exceed one story in height and be without basements, crawl spaces or other under-floor spaces. Roofs shall be of lightweight construction with suitable thermal insulation to prevent sensitive material from reaching its decomposition temperature. Group H-1 occupancies containing materials that are in themselves both physical and health hazards in quantities exceeding the maximum allowable quantities per control area in Table 307.1(2) shall comply with requirements for both Group H-1 and H-4 occupancies.

**[F] 415.6.1 Floors in storage rooms.** Floors in storage areas for organic peroxides, pyrophoric materials and unstable (reactive) materials shall be of liquid-tight, non-combustible construction.

**[F] 415.7 Special provisions for Group H-2 and H-3 occupancies.** Group H-2 and H-3 occupancies containing quantities of hazardous materials in excess of those set forth in Table 415.5.2 shall be in detached buildings used for manufacturing, processing, dispensing, use or storage of hazardous materials. Materials listed for Group H-1 occupancies in Section 307.3 are permitted to be located within Group H-2 or H-3 detached buildings provided the amount of materials per control area do not exceed the maximum allowed quantity specified in Table 307.1(1).

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**[F] TABLE 415.5.2  
DETACHED BUILDING REQUIRED**

<b>A DETACHED BUILDING IS REQUIRED WHEN THE QUANTITY OF MATERIAL EXCEEDS THAT LISTED HEREIN</b>			
<b>Material</b>	<b>Class</b>	<b>Solids and Liquids (tons)<sup>a, b</sup></b>	<b>Gases (cubic feet)<sup>a, b</sup></b>
Explosives	Division 1.1	Maximum Allowable Quantity	Not Applicable
	Division 1.2	Maximum Allowable Quantity	
	Division 1.3	Maximum Allowable Quantity	
	Division 1.4	Maximum Allowable Quantity	
	Division 1.4 <sup>c</sup>	1	
	Division 1.5	Maximum Allowable Quantity	
Oxidizers	Division 1.6	Maximum Allowable Quantity	Not Applicable
	Class 4	Maximum Allowable Quantity	
Unstable (reactives) detonable	Class 3 or 4	Maximum Allowable Quantity	Maximum Allowable Quantity
Oxidizer, liquids and solids	Class 3	1,200	Not Applicable
	Class 2	2,000	Not Applicable
Organic peroxides	Detonable	Maximum Allowable Quantity	Not Applicable
	Class I	Maximum Allowable Quantity	Not Applicable
	Class II	25	Not Applicable
	Class III	50	Not Applicable
Unstable (reactives) nondetonable	Class 3	1	2,000
	Class 2	25	10,000
Water reactives	Class 3	1	Not Applicable
	Class 2	25	Not Applicable
Pyrophoric gases	Not Applicable	Not Applicable	2,000

For SI: 1 ton = 906 kg, 1 cubic foot = 0.02832 m<sup>3</sup>, 1 pound = 0.454 kg.

- a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Chapter 33 of the *California Fire Code* based on trinitrotoluene (TNT) equivalence of the material. For materials classified as explosives, see Chapter 56 of the *California Fire Code*.
- b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 307.1(1).
- c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, provided the net explosive weight of individual articles does not exceed 1 pound.

**[F] 415.7.1 Detached buildings.** Detached buildings shall not exceed one story in height and shall be without basements, crawl spaces or other under-floor spaces.

**[F] 415.7.2 Multiple hazards.** Group H-2 or H-3 occupancies containing materials which are in themselves both physical and health hazards in quantities exceeding the maximum allowable quantities per control area in Table 307.1(2) shall comply with requirements for Group H-2, H-3 or H-4 occupancies as applicable.

**[F] 415.7.3 Separation of incompatible materials.** Hazardous materials other than those listed in Table 415.3.2 shall be allowed in manufacturing, processing, dispensing, use or storage areas when separated from incompatible materials in accordance with the provisions of the *California Fire Code*.

**[F] 415.7.4 Water reactives.** Group H-2 and H-3 occupancies containing water-reactive materials shall be resistant to water penetration. Piping for conveying liquids shall not be over or through areas containing water reactives, unless isolated by approved liquid-tight construction.

**Exception:** Fire protection piping shall be permitted over or through areas containing water reactives without isolating it with liquid-tight construction.

**[F] 415.7.5 Floors in storage rooms.** Floors in storage areas for organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials and water-reactive solids and liquids shall be of liquid-tight, noncombustible construction.

**[F] 415.7.6 Waterproof room.** Rooms or areas used for the storage of water-reactive solids and liquids shall be constructed in a manner that resists the penetration of water through the use of waterproof materials. Piping carrying water for other than approved automatic sprinkler systems shall not be within such rooms or areas.

**[F] 415.8 Group H-2.** Occupancies in Group H-2 shall be constructed in accordance with Sections 415.8.1 through 415.8.4 and the *California Fire Code*.

**[F] 415.8.1 Combustible dusts, grain processing and storage.** The provisions of Sections 415.8.1.1 through 415.8.1.6 shall apply to buildings in which materials that

produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664, and the *California Fire Code*.

**[F] 415.8.1.1 Type of construction and height exceptions.** Buildings shall be constructed in compliance with the height and area limitations of Table 503 for Group H-2; except that where erected of Type I or II construction, the heights and areas of grain elevators and similar structures shall be unlimited, and where of Type IV construction, the maximum building height shall be 65 feet (19 812 mm) and except further that, in isolated areas, the maximum building height of Type IV structures shall be increased to 85 feet (25 908 mm).

**[F] 415.8.1.2 Grinding rooms.** Every room or space occupied for grinding or other operations that produce combustible dusts shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating of the enclosure shall be not less than 2 hours where the area is not more than 3,000 square feet ( $279 \text{ m}^2$ ), and not less than 4 hours where the area is greater than 3,000 square feet ( $279 \text{ m}^2$ ).

**[F] 415.8.1.3 Conveyors.** Conveyors, chutes, piping and similar equipment passing through the enclosures of rooms or spaces shall be constructed dirt tight and vapor tight, and be of approved noncombustible materials complying with Chapter 30.

**[F] 415.8.1.4 Explosion control.** Explosion control shall be provided as specified in the *California Fire Code*, or spaces shall be equipped with the equivalent mechanical ventilation complying with the *California Mechanical Code*.

**[F] 415.8.1.5 Grain elevators.** Grain elevators, malt houses and buildings for similar occupancies shall not be located within 30 feet (9144 mm) of interior lot lines or structures on the same lot, except where erected along a railroad right-of-way.

**[F] 415.8.1.6 Coal pockets.** Coal pockets located less than 30 feet (9144 mm) from interior lot lines or from structures on the same lot shall be constructed of not less than Type IB construction. Where more than 30 feet (9144 mm) from interior lot lines, or where erected along a railroad right-of-way, the minimum type of construction of such structures not more than 65 feet (19 812 mm) in building height shall be Type IV.

**[F] 415.8.2 Flammable and combustible liquids.** The storage, handling, processing and transporting of flammable and combustible liquids in Groups H-2 and H-3 occupancies shall be in accordance with Sections 415.8.2.1 through 415.8.2.9, the *California Mechanical Code* and the *California Fire Code*.

**[F] 415.8.2.1 Mixed occupancies.** Where the storage tank area is located in a building of two or more occu-

pancies and the quantity of liquid exceeds the maximum allowable quantity for one control area, the use shall be completely separated from adjacent occupancies in accordance with the requirements of Section 508.4.

**[F] 415.8.2.1.1 Height exception.** Where storage tanks are located within a building no more than one story above grade plane, the height limitation of Section 503 shall not apply for Group H.

**[F] 415.8.2.2 Tank protection.** Storage tanks shall be noncombustible and protected from physical damage. Fire barriers or horizontal assemblies or both around the storage tanks shall be permitted as the method of protection from physical damage.

**[F] 415.8.2.3 Tanks.** Storage tanks shall be approved tanks conforming to the requirements of the *California Fire Code*.

**[F] 415.8.2.4 Leakage containment.** A liquid-tight containment area compatible with the stored liquid shall be provided. The method of spill control, drainage control and secondary containment shall be in accordance with the *California Fire Code*.

**Exception:** Rooms where only double-wall storage tanks conforming to Section 415.8.2.3 are used to store Class I, II and IIIA flammable and combustible liquids shall not be required to have a leakage containment area.

**[F] 415.8.2.5 Leakage alarm.** An approved automatic alarm shall be provided to indicate a leak in a storage tank and room. The alarm shall sound an audible signal, 15 dBA above the ambient sound level, at every point of entry into the room in which the leaking storage tank is located. An approved sign shall be posted on every entry door to the tank storage room indicating the potential hazard of the interior room environment, or the sign shall state: WARNING, WHEN ALARM SOUNDS, THE ENVIRONMENT WITHIN THE ROOM MAY BE HAZARDOUS. The leakage alarm shall also be supervised in accordance with Chapter 9 to transmit a trouble signal.

**[F] 415.8.2.6 Tank vent.** Storage tank vents for Class I, II or IIIA liquids shall terminate to the outdoor air in accordance with the *California Fire Code*.

**[F] 415.8.2.7 Room ventilation.** Storage tank areas storing Class I, II or IIIA liquids shall be provided with mechanical ventilation. The mechanical ventilation system shall be in accordance with the *California Mechanical Code* and the *California Fire Code*.

**[F] 415.8.2.8 Explosion venting.** Where Class I liquids are being stored, explosion venting shall be provided in accordance with the *California Fire Code*.

**[F] 415.8.2.9 Tank openings other than vents.** Tank openings other than vents from tanks inside buildings shall be designed to ensure that liquids or vapor concentrations are not released inside the building.

**[F] 415.8.3 Liquefied petroleum gas facilities.** The construction and installation of liquefied petroleum gas facilities shall be in accordance with the requirements of this code, the *California Fire Code*, the *California Mechanical Code*, the *California Plumbing Code* and NFPA 58.

**[F] 415.8.4 Dry cleaning plants.** The construction and installation of dry cleaning plants shall be in accordance with the requirements of this code, the *California Mechanical Code*, the *California Plumbing Code* and NFPA 32. Dry cleaning solvents and systems shall be classified in accordance with the *California Fire Code*.

**[F] 415.9 Groups H-3 and H-4.** Groups H-3 and H-4 shall be constructed in accordance with the applicable provisions of this code and the *California Fire Code*.

**[F] 415.9.1 Flammable and combustible liquids.** The storage, handling, processing and transporting of flammable and combustible liquids in Group H-3 occupancies shall be in accordance with Section 415.8.2.

**[F] 415.9.2 Gas rooms.** Where gas rooms are provided, such rooms shall be separated from other areas by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**[F] 415.9.3 Floors in storage rooms.** Floors in storage areas for corrosive liquids and highly toxic or toxic materials shall be of liquid-tight, noncombustible construction.

**[F] 415.9.4 Separation-highly toxic solids and liquids.** Highly toxic solids and liquids not stored in approved hazardous materials storage cabinets shall be isolated from other hazardous materials storage by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**[F] 415.10 Group H-5.** In addition to the requirements set forth elsewhere in this code, Group H-5 shall comply with the provisions of Sections 415.10.1 through 415.10.11 and the *California Fire Code*.

**[F] 415.10.1 Fabrication areas.** Fabrication areas shall comply with Sections 415.10.1.1 through 415.10.1.8.

**[F] 415.10.1.1 Hazardous materials.** Hazardous materials and hazardous production materials (HPM) shall comply with Sections 415.10.1.1.1 and 415.10.1.1.2.

**[F] 415.10.1.1.1 Aggregate quantities.** The aggregate quantities of hazardous materials stored and used in a single fabrication area shall not exceed the quantities set forth in Table 415.10.1.1.1.

**Exception:** The quantity limitations for any hazard category in Table 415.10.1.1.1 shall not apply where the fabrication area contains quantities of hazardous materials not exceeding the maximum

allowable quantities per control area established by Tables 307.1(1) and 307.1(2).

**[F] 415.10.1.1.2 Hazardous production materials.** The maximum quantities of hazardous production materials (HPM) stored in a single fabrication area shall not exceed the maximum allowable quantities per control area established by Tables 307.1(1) and 307.1(2).

**[F] 415.10.1.2 Separation.** Fabrication areas, whose sizes are limited by the quantity of hazardous materials allowed by Table 415.10.1.1.1, shall be separated from each other, from corridors and from other parts of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

#### Exceptions:

1. Doors within such fire barrier walls, including doors to corridors, shall be only self-closing fire door assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.
2. Windows between fabrication areas and corridors are permitted to be fixed glazing listed and labeled for a fire protection rating of not less than  $\frac{3}{4}$  hour in accordance with Section 716.

**[F] 415.10.1.3 Location of occupied levels.** Occupied levels of fabrication areas shall be located at or above the first story above grade plane.

**[F] 415.10.1.4 Floors.** Except for surfacing, floors within fabrication areas shall be of noncombustible construction.

Openings through floors of fabrication areas are permitted to be unprotected where the interconnected levels are used solely for mechanical equipment directly related to such fabrication areas (see also Section 415.10.1.5).

Floors forming a part of an occupancy separation shall be liquid tight.

**[F] 415.10.1.5 Shafts and openings through floors.** Elevator hoistways, vent shafts and other openings through floors shall be enclosed where required by Sections 712 and 713. Mechanical, duct and piping penetrations within a fabrication area shall not extend through more than two floors. The annular space around penetrations for cables, cable trays, tubing, piping, conduit or ducts shall be sealed at the floor level to restrict the movement of air. The fabrication area, including the areas through which the ductwork and piping extend, shall be considered a single conditioned environment.

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

[F] TABLE 415.10.1.1.1  
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5<sup>a</sup>

HAZARD CATEGORY	SOLIDS (pounds per square foot)		LIQUIDS (gallons per square foot)	GAS (cubic feet @ NTP/square foot)
<b>PHYSICAL-HAZARD MATERIALS</b>				
Combustible dust		Note b	Not Applicable	Not Applicable
Combustible fiber	Loose Baled	Note b Notes b, c	Not Applicable	Not Applicable
Combustible liquid	II III A III B	Not Applicable	0.01 0.02 Not Limited	Not Applicable
Combination Class	I, II and III A		0.04	
Cryogenic gas	Flammable Oxidizing	Not Applicable	Not Applicable	Note d 1.25
Explosives		Note b	Note b	Note b
Flammable gas	Gaseous Liquefied	Not Applicable	Not Applicable	Note d Note d
Flammable liquid	IA IB IC	Not Applicable	0.0025 0.025 0.025	Not Applicable
Combination Class	IA, IB and IC		0.025 0.04	
Combination Class	I, II and III A			
Flammable solid		0.001	Not Applicable	Not Applicable
Organic peroxide	Unclassified detonable Class I Class II Class III Class IV Class V	Note b Note b 0.025 0.1 Not Limited Not Limited	Not Applicable	Not Applicable
Oxidizing gas	Gaseous Liquefied	Not Applicable	Not Applicable	1.25 1.25
Combination of gaseous and liquefied				1.25
Oxidizer	Class 4 Class 3 Class 2 Class 1	Note b 0.003 0.003 0.003	Note b 0.03 0.03 0.03	Not Applicable
Combination Class	1, 2, 3	0.003	0.03	
Pyrophoric materials		0.01	0.00125	Notes d and e
Unstable (reactive)	Class 4 Class 3 Class 2 Class 1	Note b 0.025 0.1 Not Limited	Note b 0.0025 0.01 Not Limited	Note b Note b Note b Not Limited
Water reactive	Class 3 Class 2 Class 1	Note b 0.25 Not Limited	0.00125 0.025 Not Limited	Not Applicable
<b>HEALTH-HAZARD MATERIALS</b>				
Corrosives		Not Limited	Not Limited	Not Limited
Highly toxic		Not Limited	Not Limited	Note d
Toxics		Not Limited	Not Limited	Note d

For SI: 1 pound per square foot = 4.882 kg/m<sup>2</sup>, 1 gallon per square foot = 40.7 L/m<sup>2</sup>, 1 cubic foot @ NTP/square foot = 0.305 m<sup>3</sup> @ NTP/m<sup>2</sup>, 1 cubic foot = 0.02832 m<sup>3</sup>.

- a. Hazardous materials within piping shall not be included in the calculated quantities.
- b. Quantity of hazardous materials in a single fabrication shall not exceed the maximum allowable quantities per control area in Tables 307.1(1) and 307.1(2).
- c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
- d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 cubic feet at NTP.
- e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.5.2.

**[F] 415.10.1.6 Ventilation.** Mechanical exhaust ventilation at the rate of not less than 1 cubic foot per minute per square foot [ $0.0051 \text{ m}^3/(\text{s} \cdot \text{m}^2)$ ] of floor area shall be provided throughout the portions of the fabrication area where HPM are used or stored. The exhaust air duct system of one fabrication area shall not connect to another duct system outside that fabrication area within the building.

A ventilation system shall be provided to capture and exhaust gases, fumes and vapors at workstations.

Two or more operations at a workstation shall not be connected to the same exhaust system where either one or the combination of the substances removed could constitute a fire, explosion or hazardous chemical reaction within the exhaust duct system.

Exhaust ducts penetrating fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711 shall be contained in a shaft of equivalent fire-resistance-rated construction. Exhaust ducts shall not penetrate fire walls.

Fire dampers shall not be installed in exhaust ducts.

**[F] 415.10.1.7 Transporting hazardous production materials to fabrication areas.** HPM shall be transported to fabrication areas through enclosed piping or tubing systems that comply with Section 415.10.6, through service corridors complying with Section 415.10.3, or in corridors as permitted in the exception to Section 415.10.2. The handling or transporting of HPM within service corridors shall comply with the *California Fire Code*.

**[F] 415.10.1.8 Electrical.** Electrical equipment and devices within the fabrication area shall comply with NFPA 70. The requirements for hazardous locations need not be applied where the average air change is at least four times that set forth in Section 415.10.1.6 and where the number of air changes at any location is not less than three times that required by Section 415.10.1.6. The use of recirculated air shall be permitted.

**[F] 415.10.1.8.1 Workstations.** Workstations shall not be energized without adequate exhaust ventilation. See Section 415.10.1.6 for workstation exhaust ventilation requirements.

**[F] 415.10.2 Corridors.** Corridors shall comply with Chapter 10 and shall be separated from fabrication areas as specified in section 415.10.1.2. Corridors shall not contain HPM and shall not be used for transporting such materials except through closed piping systems as provided in Section 415.10.6.4

**Exception:** Where existing fabrication areas are altered or modified, HPM is allowed to be transported in existing corridors, subject to the following conditions:

1. Nonproduction HPM is allowed to be transported in corridors if utilized for maintenance, lab work and testing.

2. Where existing fabrication areas are altered or modified, HPM is allowed to be transported in existing corridors, subject to the following conditions:

2.1. Corridors. Corridors adjacent to the fabrication area where the alteration work is to be done shall comply with Section 1018 for a length determined as follows:

2.1.1. The length of the common wall of the corridor and the fabrication area; and

2.1.2. For the distance along the corridor to the point of entry of HPM into the corridor serving that fabrication area.

2.2. Emergency alarm system. There shall be an emergency telephone system, a local manual alarm station or other approved alarm-initiating device within corridors at not more than 150-foot (45 720 mm) intervals and at each exit and doorway. The signal shall be relayed to an approved central, proprietary or remote station service or the emergency control station and shall also initiate a local audible alarm.

2.3. Pass-throughs. Self-closing doors having a fire protection rating of not less than 1 hour shall separate pass-throughs from existing corridors. Pass-throughs shall be constructed as required for the corridors and protected by an approved automatic sprinkler system.

**[F] 415.10.3 Service corridors.** Service corridors within a Group H-5 occupancy shall comply with Sections 415.10.3.1 through 415.10.3.4.

**[F] 415.10.3.1 Use conditions.** Service corridors shall be separated from corridors as required by Section 415.10.1.2. Service corridors shall not be used as a required corridor.

**[F] 415.10.3.2 Mechanical ventilation.** Service corridors shall be mechanically ventilated as required by Section 415.10.1.6 or at not less than six air changes per hour, whichever is greater.

**[F] 415.10.3.3 Means of egress.** The distance of travel from any point in a service corridor to an exit, exit access corridor or door into a fabrication area shall be not greater than 75 feet (22 860 mm). Dead ends shall be not greater than 4 feet (1219 mm) in length. There shall be not less than two exits, and not more than one-half of the required means of egress shall require travel into a fabrication area. Doors from service corridors shall swing in the direction of egress travel and shall be self-closing.

**[F] 415.10.3.4 Minimum width.** The clear width of a service corridor shall be not less than 5 feet (1524 mm),

or 33 inches (838 mm) wider than the widest cart or truck used in the service corridor, whichever is greater.

**[F] 415.10.3.5 Emergency alarm system.** Emergency alarm systems shall be provided in accordance with this section and Sections 414.7.1 and 414.7.2. The maximum allowable quantity per control area provisions shall not apply to emergency alarm systems required for HPM.

**[F] 415.10.3.5.1 Service corridors.** An emergency alarm system shall be provided in service corridors, with no fewer than one alarm device in each service corridor.

**[F] 415.10.3.5.2 Corridors and interior exit stairways and ramps.** Emergency alarms for corridors, interior exit stairways and ramps and exit passageways shall comply with Section 414.7.2.

**[F] 415.10.3.5.3 Liquid storage rooms, HPM rooms and gas rooms.** Emergency alarms for liquid storage rooms, HPM rooms and gas rooms shall comply with Section 414.7.1.

**[F] 415.10.3.5.4 Alarm-initiating devices.** An approved emergency telephone system, local alarm manual pull stations, or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

**[F] 415.10.3.5.5 Alarm signals.** Activation of the emergency alarm system shall sound a local alarm and transmit a signal to the emergency control station.

**[F] 415.10.4 Storage of hazardous production materials.** Storage of hazardous production materials (HPM) in fabrication areas shall be within approved or listed storage cabinets or gas cabinets or within a workstation. The storage of HPM in quantities greater than those listed in Section 5004.2 of the *California Fire Code* shall be in liquid storage rooms, HPM rooms or gas rooms as appropriate for the materials stored. The storage of other hazardous materials shall be in accordance with other applicable provisions of this code and the *California Fire Code*.

**[F] 415.10.5 HPM rooms, gas rooms, liquid storage room construction.** HPM rooms, gas rooms and liquid shall be constructed in accordance with Sections 415.10.5.1 through 415.10.5.9.

**[F] 415.10.5.1 HPM rooms and gas rooms.** HPM rooms and gas rooms shall be separated from other areas by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall be not less than 2 hours where the area is 300 square feet ( $27.9 \text{ m}^2$ ) or more and not less than 1 hour where the area is less than 300 square feet ( $27.9 \text{ m}^2$ ).

**[F] 415.10.5.2 Liquid storage rooms.** Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms greater than 500 square feet ( $46.5 \text{ m}^2$ ) in area, shall have no fewer than one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall be not less than 1 hour for rooms up to 150 square feet ( $13.9 \text{ m}^2$ ) in area and not less than 2 hours where the room is more than 150 square feet ( $13.9 \text{ m}^2$ ) in area.
3. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood of not less than 1-inch (25 mm) nominal thickness or fire-retardant-treated wood complying with Section 2303.2.
4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

**[F] 415.10.5.3 Floors.** Except for surfacing, floors of HPM rooms and liquid storage rooms shall be of non-combustible liquid-tight construction. Raised grating over floors shall be of noncombustible materials.

**[F] 415.10.5.4 Location.** Where HPM rooms, liquid storage rooms and gas rooms are provided, they shall have no fewer than one exterior wall and such wall shall be not less than 30 feet (9144 mm) from lot lines, including lot lines adjacent to public ways.

**[F] 415.10.5.5 Explosion control.** Explosion control shall be provided where required by Section 414.5.1.

**[F] 415.10.5.6 Exits.** Where two exits are required from HPM rooms, liquid storage rooms and gas rooms, one shall be directly to the outside of the building.

**[F] 415.10.5.7 Doors.** Doors in a fire barrier wall, including doors to corridors, shall be self-closing fire door assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.

**[F] 415.10.5.8 Ventilation.** Mechanical exhaust ventilation shall be provided in liquid storage rooms, HPM rooms and gas rooms at the rate of not less than 1 cubic foot per minute per square foot ( $0.044 \text{ L/s/m}^2$ ) of floor area or six air changes per hour, whichever is greater, for categories of material.

Exhaust ventilation for gas rooms shall be designed to operate at a negative pressure in relation to the surrounding areas and direct the exhaust ventilation to an exhaust system.

**[F] 415.10.5.9 Emergency alarm system.** An approved emergency alarm system shall be provided for HPM rooms, liquid storage rooms and gas rooms.

Emergency alarm-initiating devices shall be installed outside of each interior exit door of such rooms.

Activation of an emergency alarm-initiating device shall sound a local alarm and transmit a signal to the emergency control station.

An approved emergency telephone system, local alarm manual pull stations or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices.

**[F] 415.10.6 Piping and tubing.** Hazardous production materials piping and tubing shall comply with this section and ASME B31.3.

**[F] 415.10.6.1 HPM having a health-hazard ranking of 3 or 4.** Systems supplying HPM liquids or gases having a health-hazard ranking of 3 or 4 shall be welded throughout, except for connections, to the systems that are within a ventilated enclosure if the material is a gas, or an approved method of drainage or containment is provided for the connections if the material is a liquid.

**[F] 415.10.6.2 Location in service corridors.** Hazardous production materials supply piping or tubing in service corridors shall be exposed to view.

**[F] 415.10.6.3 Excess flow control.** Where HPM gases or liquids are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103.4 kPa), excess flow control shall be provided. Where the piping originates from within a liquid storage room, HPM room or gas room, the excess flow control shall be located within the liquid storage room, HPM room or gas room. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

**[F] 415.10.6.4 Installations in corridors and above other occupancies.** The installation of HPM piping and tubing within the space defined by the walls of corridors and the floor or roof above, or in concealed spaces above other occupancies, shall be in accordance with Sections 415.10.6.1 through 415.10.6.3 and the following conditions:

1. Automatic sprinklers shall be installed within the space unless the space is less than 6 inches (152 mm) in the least dimension.
2. Ventilation not less than six air changes per hour shall be provided. The space shall not be used to convey air from any other area.
3. Where the piping or tubing is used to transport HPM liquids, a receptor shall be installed below such piping or tubing. The receptor shall be designed to collect any discharge or leakage and drain it to an approved location. The 1-hour enclosure shall not be used as part of the receptor.
4. HPM supply piping and tubing and nonmetallic waste lines shall be separated from the corridor and from occupancies other than Group H-5 by

fire barriers that have a fire-resistance rating of not less than 1 hour. Where gypsum wallboard is used, joints on the piping side of the enclosure are not required to be taped, provided the joints occur over framing members. Access openings into the enclosure shall be protected by approved fire protection-rated assemblies.

5. Readily accessible manual or automatic remotely activated fail-safe emergency shutoff valves shall be installed on piping and tubing other than waste lines at the following locations:

5.1. At branch connections into the fabrication area.

5.2. At entries into corridors.

**Exception:** Transverse crossings of the corridors by supply piping that is enclosed within a ferrous pipe or tube for the width of the corridor need not comply with Items 1 through 5.

**[F] 415.10.6.5 Identification.** Piping, tubing and HPM waste lines shall be identified in accordance with ANSI A13.1 to indicate the material being transported.

**[F] 415.10.7 Continuous gas detection systems.** A continuous gas detection system shall be provided for HPM gases where the physiological warning threshold level of the gas is at a higher level than the accepted permissible exposure limit (PEL) for the gas and for flammable gases in accordance with Sections 415.10.7.1 and 415.10.7.2.

**[F] 415.10.7.1 Where required.** A continuous gas detection system shall be provided in the areas identified in Sections 415.10.7.1.1 through 415.10.7.1.4.

**[F] 415.10.7.1.1 Fabrication areas.** A continuous gas detection system shall be provided in fabrication areas where gas is used in the fabrication area.

**[F] 415.10.7.1.2 HPM rooms.** A continuous gas detection system shall be provided in HPM rooms where gas is used in the room.

**[F] 415.10.7.1.3 Gas cabinets, exhausted enclosures and gas rooms.** A continuous gas detection system shall be provided in gas cabinets and exhausted enclosures. A continuous gas detection system shall be provided in gas rooms where gases are not located in gas cabinets or exhausted enclosures.

**[F] 415.10.7.1.4 Corridors.** Where gases are transported in piping placed within the space defined by the walls of a corridor and the floor or roof above the corridor, a continuous gas detection system shall be provided where piping is located and in the corridor.

**Exception:** A continuous gas detection system is not required for occasional transverse crossings of the corridors by supply piping that is enclosed in a ferrous pipe or tube for the width of the corridor.

**[F] 415.10.7.2 Gas detection system operation.** The continuous gas detection system shall be capable of

monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values where the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels where the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) where the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
4. Except as noted in this section, monitoring for highly toxic and toxic gases shall also comply with Chapter 60 of the *California Fire Code*.

**[F] 415.10.7.2.1 Alarms.** The gas detection system shall initiate a local alarm and transmit a signal to the emergency control station when a short-term hazard condition is detected. The alarm shall be both visual and audible and shall provide warning both inside and outside the area where the gas is detected. The audible alarm shall be distinct from all other alarms.

**[F] 415.10.7.2.2 Shutoff of gas supply.** The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for which gas is detected when a short-term hazard condition is detected. Automatic closure of shutoff valves shall comply with the following:

1. Where the gas detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas detection sampling point initiating the gas detection system alarm is within a room and compressed gas containers are not in gas cabinets or an exhausted enclosure, the shutoff valves on all gas lines for the specific gas detected shall automatically close.
3. Where the gas detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve supplying the manifold for the compressed gas container of the specific gas detected shall automatically close.

**Exception:** Where the gas detection sampling point initiating the gas detection system alarm is at the use location or within a gas valve enclosure of a branch line downstream of a piping distribu-

tion manifold, the shutoff valve for the branch line located in the piping distribution manifold enclosure shall automatically close.

**[F] 415.10.8 Manual fire alarm system.** An approved manual fire alarm system shall be provided throughout buildings containing Group H-5. Activation of the alarm system shall initiate a local alarm and transmit a signal to the emergency control station. The fire alarm system shall be designed and installed in accordance with Section 907.

**[F] 415.10.9 Emergency control station.** An emergency control station shall be provided in accordance with Sections 415.10.9.1 through 415.10.9.3.

**[F] 415.10.9.1 Location.** The emergency control station shall be located on the premises at an approved location outside the fabrication area.

**[F] 415.10.9.2 Staffing.** Trained personnel shall continuously staff the emergency control station.

**[F] 415.10.9.3 Signals.** The emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems shall include, but not be limited to, the following where such equipment or systems are required to be provided either in this chapter or elsewhere in this code:

1. Automatic sprinkler system alarm and monitoring systems.
2. Manual fire alarm systems.
3. Emergency alarm systems.
4. Continuous gas detection systems.
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4 of the *California Fire Code*.
8. Exhaust ventilation flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 2705.2.3.4 of the *California Fire Code*.

**[F] 415.10.10 Emergency power system.** An emergency power system shall be provided in Group H-5 occupancies where required in Section 415.10.10.1. The emergency power system shall be designed to supply power automatically to required electrical systems when the normal electrical supply system is interrupted.

**[F] 415.10.10.1 Required electrical systems.** Emergency power shall be provided for electrically operated equipment and connected control circuits for the following systems:

1. HPM exhaust ventilation systems.
2. HPM gas cabinet ventilation systems.
3. HPM exhausted enclosure ventilation systems.
4. HPM gas room ventilation systems.

5. HPM gas detection systems.
6. Emergency alarm systems.
7. Manual fire alarm systems.
8. Automatic sprinkler system monitoring and alarm systems.
9. Automatic alarm and detection systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4 of the *California Fire Code*.
10. Flow alarm switches for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 2705.2.3.4 of the *California Fire Code*.
11. Electrically operated systems required elsewhere in this code or in the *California Fire Code* applicable to the use, storage or handling of HPM.

**[F] 415.10.10.2 Exhaust ventilation systems.** Exhaust ventilation systems are allowed to be designed to operate at not less than one-half the normal fan speed on the emergency power system where it is demonstrated that the level of exhaust will maintain a safe atmosphere.

**[F] 415.10.11 Automatic sprinkler system protection in exhaust ducts for HPM.** An approved automatic sprinkler system shall be provided in exhaust ducts conveying gases, vapors, fumes, mists or dusts generated from HPM in accordance with Sections 415.10.11.1 through 415.10.11.3 and the *California Mechanical Code*.

**[F] 415.10.11.1 Metallic and noncombustible nonmetallic exhaust ducts.** An approved automatic sprinkler system shall be provided in metallic and noncombustible nonmetallic exhaust ducts where all of the following conditions apply:

1. Where the largest cross-sectional diameter is equal to or greater than 10 inches (254 mm).
2. The ducts are within the building.
3. The ducts are conveying flammable gases, vapors or fumes.

**[F] 415.10.11.2 Combustible nonmetallic exhaust ducts.** Automatic sprinkler system protection shall be provided in combustible nonmetallic exhaust ducts where the largest cross-sectional diameter of the duct is equal to or greater than 10 inches (254 mm).

**Exception:** Duct need not be provided with automatic sprinkler protection as follows:

1. Ducts listed or approved for applications without automatic sprinkler system protection.
2. Ducts not more than 12 feet (3658 mm) in length installed below ceiling level.

**[F] 415.10.11.3 Automatic sprinkler locations.** Sprinkler systems shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical ducts, sprinklers shall be installed at the top and at alternate floor levels.

#### **415.11 Group H occupancies located above the 10th story.**

**415.11.1 Fire - smoke barrier.** Any story containing a Group H occupancy above the 10th story shall be subdivided by a fire-smoke barrier constructed as a fire barrier having a fire resistance rating of not less than 2 hours and shall also comply with the smoke barrier requirements of Section 710. The 2-hour fire-smoke barrier shall be in accordance with Sections 415.11.1.1 through 415.11.1.5.

**415.11.1.1** The 2-hour fire-smoke barrier shall be continuous from exterior wall to exterior wall.

**415.11.1.2** The fire-smoke barrier shall divide the story so that the square footage on each side of the 2-hour fire-smoke barrier is not less than 30 percent of the total floor area.

**415.11.1.3** A minimum of one door opening shall be provided in the 2-hour fire-smoke barrier for emergency access.

**415.11.1.4** Each side of the 2-hour fire-smoke barrier shall be designed as a separate smoke zone designed in accordance with Section 909.6.

**415.11.1.5** The area on each side of the 2-hour fire-smoke barrier shall be served by a minimum of one exit enclosure in accordance with Section 1022.

**415.12 Elevators and elevator lobbies above the 10th story.** Any story containing a Group H occupancy above the 10th story shall be provided with elevators and elevator lobbies in accordance with Sections 415.12.1 through 415.12.3.

**415.12.1** An elevator that serves every story of the building shall be provided on each side of the 2-hour fire-smoke barrier.

**415.12.2** An elevator lobby shall be provided on each side of the 2-hour fire-smoke barrier at each floor in accordance with Section 708.14.1. Exceptions to 708.14.1 shall not apply.

**415.12.3** The elevator and its associated elevator lobbies and elevator machine rooms shall be pressurized in accordance with Section 909.6.

### **SECTION 416 APPLICATION OF FLAMMABLE FINISHES**

**[F] 416.1 General.** The provisions of this section shall apply to the construction, installation and use of buildings and structures, or parts thereof, for the application of flammable finishes. Such construction and equipment shall comply with the *California Fire Code*.

**[F] 416.2 Spray rooms.** Spray rooms shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Floors shall be waterproofed and drained in an approved manner.

**[F] 416.2.1 Surfaces.** The interior surfaces of spray rooms shall be smooth and shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be so

designed to confine residues within the room. Aluminum shall not be used.

**[F] 416.2.2 Ventilation.** Mechanical ventilation and interlocks with the spraying operation shall be in accordance with the *California Mechanical Code*.

**[F] 416.3 Spraying spaces.** Spraying spaces shall be ventilated with an exhaust system to prevent the accumulation of flammable mist or vapors in accordance with the *California Mechanical Code*. Where such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of flammable vapors.

**[F] 416.3.1 Surfaces.** The interior surfaces of spraying spaces shall be smooth and continuous without edges; shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning; and shall be so designed to confine residues within the spraying space. Aluminum shall not be used.

**[F] 416.4 Spray booths.** Spray booths shall be designed, constructed and operated in accordance with the *California Fire Code*.

**[F] 416.5 Fire protection.** An automatic sprinkler system or fire-extinguishing system shall be provided in all spray, dip and immersing spaces and storage rooms and shall be installed in accordance with Chapter 9.

## SECTION 417 DRYING ROOMS

**[F] 417.1 General.** A drying room or dry kiln installed within a building shall be constructed entirely of approved noncombustible materials or assemblies of such materials regulated by the approved rules or as required in the general and specific sections of this chapter for special occupancies and where applicable to the general requirements of the *California Mechanical Code*.

**[F] 417.2 Piping clearance.** Overhead heating pipes shall have a clearance of not less than 2 inches (51 mm) from combustible contents in the dryer.

**[F] 417.3 Insulation.** Where the operating temperature of the dryer is 175°F (79°C) or more, metal enclosures shall be insulated from adjacent combustible materials by not less than 12 inches (305 mm) of airspace, or the metal walls shall be lined with  $\frac{1}{4}$ -inch (6.35 mm) insulating mill board or other approved equivalent insulation.

**[F] 417.4 Fire protection.** Drying rooms designed for high-hazard materials and processes, including special occupancies as provided for in Chapter 4, shall be protected by an approved automatic fire-extinguishing system complying with the provisions of Chapter 9.

## SECTION 418 ORGANIC COATINGS

**[F] 418.1 Building features.** Manufacturing of organic coatings shall be done only in buildings that do not have pits or basements.

**[F] 418.2 Location.** Organic coating manufacturing operations and operations incidental to or connected therewith shall not be located in buildings having other occupancies.

**[F] 418.3 Process mills.** Mills operating with close clearances and that process flammable and heat-sensitive materials, such as nitrocellulose, shall be located in a detached building or noncombustible structure.

**[F] 418.4 Tank storage.** Storage areas for flammable and combustible liquid tanks inside of structures shall be located at or above grade and shall be separated from the processing area by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**[F] 418.5 Nitrocellulose storage.** Nitrocellulose storage shall be located on a detached pad or in a separate structure or a room enclosed with not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**[F] 418.6 Finished products.** Storage rooms for finished products that are flammable or combustible liquids shall be separated from the processing area by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

## SECTION 419 LIVE/WORK UNITS

**419.1 General.** A live/work unit shall comply with Sections 419.1 through 419.9.

**Exception:** Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit are permitted to be classified as dwelling units with accessory occupancies in accordance with Section 508.2.

**419.1.1 Limitations.** The following shall apply to all live/work areas:

1. The live/work unit is permitted to be not greater than 3,000 square feet ( $279\text{ m}^2$ ) in area;
2. The nonresidential area is permitted to be not more than 50 percent of the area of each live/work unit;
3. The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

**419.2 Occupancies.** Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/work unit where the live/work unit is in compliance with Section 419. Nonresidential uses which would otherwise be classified as either a Group H or S occupancy shall not be permitted in a live/work unit.

**Exception:** Storage shall be permitted in the live/work unit provided the aggregate area of storage in the nonresi-

dential portion of the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

**419.3 Means of egress.** Except as modified by this section, the means of egress components for a live/work unit shall be designed in accordance with Chapter 10 for the function served.

**419.3.1 Egress capacity.** The egress capacity for each element of the live/work unit shall be based on the occupant load for the function served in accordance with Table 1004.1.1.

→ **419.3.2 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1009.12 shall be permitted.

→ **419.4 Vertical openings.** Floor openings between floor levels of a live/work unit are permitted without enclosure.

[F] **419.5 Fire protection.** The live/work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9 and an automatic sprinkler system in accordance with Section 903.2.8.

**419.6 Structural.** Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.

**419.7 Accessibility.** Accessibility shall be designed in accordance with Chapter 11A and/or 11B, when applicable for the function served.

**419.8 Ventilation.** The applicable ventilation requirements of the *California Mechanical Code* shall apply to each area within the live/work unit for the function within that space.

**419.9 Plumbing facilities.** The nonresidential area of the live/work unit shall be provided with minimum plumbing facilities as specified by the *California Plumbing Code*, based on the function of the nonresidential area. Where the nonresidential area of the live/work unit is required to be accessible, the plumbing fixtures specified by the *California Plumbing Code* shall be accessible.

## SECTION 420

### GROUPS R-1, R-2, R-2.1, R-3, R3.1 and R-4

> **420.1 General.** Occupancies in Groups R-1, R-2, R-2.1, R-3, R3.1 and R-4 shall comply with the provisions of Sections 420.1 through 420.5 and other applicable provisions of this code.

**420.2 Separation walls.** Walls separating dwelling units in the same building, walls separating sleeping units in the same building and walls separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as fire partitions in accordance with Section 708.

**420.3 Horizontal separation.** Floor assemblies separating dwelling units in the same buildings, floor assemblies separating sleeping units in the same building and floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as horizontal assemblies in accordance with Section 711.

[F] **420.4 Automatic sprinkler system.** Group R occupancies shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.2.8. Group I-1 occupancies shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.2.6. Quick-response or residential automatic sprinklers shall be installed in accordance with Section 903.3.2.

[F] **420.5 Smoke detection and fire alarm systems.** Fire alarm systems and smoke alarms shall be provided in Group I-1, R-1 and R-2 occupancies in accordance with Sections 907.2.6, 907.2.8 and 907.2.9, respectively. Single-or multiple-station smoke alarms shall be in accordance with Section 907.2.11.

**420.6 Carbon monoxide alarms. (HCD 1, HCD 2 & HCD 1-AC)**

**420.6.1 Carbon monoxide alarms in new construction.** Newly constructed Group R occupancies located in a building containing a fuel-burning appliance or a building that has an attached garage shall be equipped with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the California Building Code, or an enclosed parking garage ventilated in accordance with the California Mechanical Code shall not be deemed to be an attached garage.

**Exception:** Sleeping units or dwelling units that do not themselves contain a fuel-burning appliance or have an attached garage, but that are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping unit or dwelling unit is located more than one story above or below any story that contains a fuel-burning appliance or an attached garage; and
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is equipped with a common area carbon monoxide detection system that includes all enclosed common area spaces.

**420.6.1.1 Carbon monoxide detection systems.** Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075.

**420.6.1.2 Power supply.** Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery back-up. Alarm wiring shall be directly connected to the perma-

nent building wiring without a disconnecting switch other than as required for overcurrent protection.

**Exceptions:**

1. Where there is no commercial power supply, the carbon monoxide alarm may be solely battery operated.
2. Other power sources recognized for use by NFPA 720.

**420.6.1.3 Interconnection.** Where more than one carbon monoxide alarm is required to be installed within the dwelling unit or within a sleeping unit, the alarm shall be interconnected in a manner that activation of one alarm shall activate all of the alarms in the individual unit.

**420.6.1.4 Alarm requirements.** No person shall install, market, distribute, offer for sale, or sell any carbon monoxide device in the State of California unless the device and instructions have been approved and listed by the State Fire Marshal.

Carbon monoxide alarms required by Section 420.6.1 shall be installed and maintained in the following locations:

1. Outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedroom(s).
2. On every level of a dwelling unit including basements.
3. Group R-1 Occupancies only.
  - a. On the ceiling of every sleeping unit or other locations within the sleeping unit in compliance with the manufacturer's installation instructions.

**420.6.1.5 Multiple-purpose alarms.** Carbon monoxide alarms combined with smoke alarms shall comply with Section 420.6, all applicable standards, and requirements for listing and approval by the Office of the State Fire Marshal, for smoke alarms.

**420.6.1.6 Visible alarms.** In buildings containing covered multifamily dwellings as defined in Chapter 2, with fuel-burning appliances and/or attached garages as described in Section 420.6.1, all required carbon monoxide alarms shall be equipped with the capability to support visible alarm notification in accordance with NFPA 720.

**420.6.2 Carbon monoxide alarms in existing dwellings or sleeping units.** Existing Group R occupancies located in a building with a fossil fuel-burning heater or appliance, fireplace or an attached garage shall have single station carbon monoxide alarms installed in accordance with this section. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions.

An open parking garage, as defined in the California Building Code, or an enclosed parking garage ventilated

in accordance with the California Mechanical Code shall not be deemed to be an attached garage.

**Exception:** Sleeping units or dwelling units that do not themselves contain a fossil fuel-burning heater or appliance, fireplace or an attached garage, but that are located in a building with a fossil fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping unit or dwelling unit is located more than one story above or below any story that contains a fuel-burning appliance or an attached garage; and
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is equipped with a common area carbon monoxide detection system, carbon monoxide detector or combination detector in the same space as permanently installed fuel-burning appliance(s).

**420.6.2.1 Carbon monoxide detection systems.** Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720 shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075.

**420.6.2.2 Existing dwellings or sleeping units requiring a permit.** When a permit is required for alterations, repairs or additions with a total cost or calculated valuation exceeding one thousand dollars (\$1,000), existing dwellings or sleeping units with a fossil fuel-burning heater or appliance, fireplace or an attached garage shall have a carbon monoxide alarm installed in accordance with Section 420.6.2. Carbon monoxide alarms shall only be required in the specific dwelling unit or sleeping unit for which the permit was obtained.

**420.6.2.3 Existing dwellings or sleeping units not requiring a permit (no construction taking place).** Pursuant to Health and Safety Code Section 17926, a carbon monoxide alarm(s) shall be installed in every existing dwelling unit or sleeping unit with a fossil fuel-burning heater or appliance, fireplace or an attached garage as follows:

**420.6.2.3.1 Carbon monoxide alarms on or after July 1, 2011.** Carbon monoxide alarms shall be installed in accordance with Section 420.6.2 in existing detached single-family dwellings or sleeping units intended for human occupancy that have a fossil fuel-burning heater or appliance, fireplace or an attached garage. Carbon monoxide alarms in existing buildings are permitted to be solely battery operated or plug-in type with battery back-up in areas where no construction is taking place.

**420.6.2.3.2 Carbon monoxide alarms on or after January 1, 2013.** Carbon monoxide alarms shall be

installed in accordance with Section 420.6.2 in all other existing dwelling units intended for human occupancy as defined in Health and Safety Code Section 13262(b) that have a fossil fuel-burning heater or appliance, fireplace or an attached garage. Carbon monoxide alarms in existing buildings are permitted to be solely battery operated or plug-in type with battery back-up in areas where no construction is taking place.

**Note:** See Section 420.6.2.3.3, which extends the required carbon monoxide alarms installation date for existing hotel and motel dwelling units intended for human occupancy.

**420.6.2.3.3 Carbon monoxide alarms on or after January 1, 2016.** Carbon monoxide alarms shall be installed in accordance with Section 420.6.2 in existing hotel and motel dwelling units intended for human occupancy as defined in Health and Safety Code Section 13262(b) that have a fossil fuel-burning heater or appliance, fireplace or an attached garage. Carbon monoxide alarms in existing buildings are permitted to be solely battery operated or plug-in type with battery back-up in areas where no construction is taking place.

**420.6.2.4 Power supply.** Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with battery back-up. Alarm wiring shall be directly connected to the permanent building wiring without a disconnecting switch other than as required for overcurrent protection.

**Exceptions:**

1. In existing dwelling units where there is no commercial power supply, the carbon monoxide alarm may be solely battery operated.
2. In existing dwelling units, a carbon monoxide alarm is permitted to be solely battery operated or plug-in with a battery backup where repairs or alterations do not result in the removal of wall and ceiling finishes.
3. In existing dwelling units, a carbon monoxide alarm is permitted to be solely battery operated or plug-in with battery backup where repairs or alterations are limited to the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck.
4. In existing dwelling units, a carbon monoxide alarm is permitted to be solely battery operated or plug-in with battery backup when work is limited to the installation, alteration or repair of plumbing or mechanical systems or the installation, alteration or repair of electrical systems, which do not result in the removal of interior wall or ceiling finishes exposing the structure.

5. Other power sources recognized for use by NFPA 720.

**420.6.2.5 Interconnection.** Where more than one carbon monoxide alarm is required to be installed within the dwelling unit or within a sleeping unit, the alarm shall be interconnected in a manner that activation of one alarm shall activate all of the alarms in the individual unit.

**Exceptions:**

1. In existing dwelling units or within sleeping units, interconnection is not required where repairs do not result in the removal of wall and ceiling finishes and no previous method for interconnection existed.
2. In existing dwelling units, carbon monoxide alarms are not required to be interconnected where no construction is taking place.
3. In existing dwelling units, carbon monoxide alarms are not required to be interconnected where repairs or alterations are limited to the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck.
4. In existing dwelling units, carbon monoxide alarms are not required to be interconnected when work is limited to the installation, alteration or repair of plumbing or mechanical systems or the installation, alteration or repair of electrical systems, which do not result in the removal of interior wall or ceiling finishes exposing the structure.

**420.6.2.6 Alarm requirements.** No person shall install, market, distribute, offer for sale, or sell any carbon monoxide device in the State of California unless the device and instructions have been approved and listed by the State Fire Marshal.

Carbon monoxide alarms required by Section 420.6.2 shall be installed and maintained in the following locations:

1. Outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedroom(s).
2. On every level of a dwelling unit including basements.
3. Group R-1 Occupancies only.
  - a. On the ceiling of every sleeping unit or other locations within the sleeping unit in compliance with the manufacturer's installation instructions.

**420.7 (HCD 1) Construction waste management.** Recycle and/or salvage for reuse a minimum of 50 percent of the non-hazardous construction and demolition waste in accordance with the California Green Building Standards Code (CAL-Green), Chapter 4, Division 4.4.

**420.8 Special provisions for residential hotels. (HCD 1 & HCD 1-AC)**

**420.8.1 Locking mail receptacles.** A locking mail receptacle for each residential unit shall be provided in all residential hotels pursuant to the requirements specified in Heath and Safety Code Section 17958.3.

**420.9 Licensed 24-hour care facilities in a Group R-2.1, R-3.1 or R-4 occupancy.** See Section 425 for Special Provisions for licensed 24-hour care facilities in a Group R-2.1, R-3.1, or R-4 occupancy.

**420.10 Existing Group R Occupancies.** See Chapter 34.

## SECTION 421 HYDROGEN FUEL GAS ROOMS

**[F] 421.1 General.** Where required by the *California Fire Code*, hydrogen fuel gas rooms shall be designed and constructed in accordance with Sections 421.1 through 421.8.

**[F] 421.2 Definitions.** The following terms are defined in Chapter 2:

### GASEOUS HYDROGEN SYSTEM.

#### HYDROGEN FUEL GAS ROOM.

**[F] 421.3 Location.** Hydrogen fuel gas rooms shall not be located below grade.

**[F] 421.4 Design and construction.** Hydrogen fuel gas rooms *not classified as Group H* shall be separated from other areas of the building in accordance with Section 509.1.

**[F] 421.4.1 Pressure control.** Hydrogen gas rooms shall be provided with a ventilation system designed to maintain the room at a negative pressure in relation to surrounding rooms and spaces.

**[F] 421.4.2 Windows.** Operable windows in interior walls shall not be permitted. Fixed windows shall be permitted where in accordance with Section 716.

**[F] 421.5 Exhaust ventilation.** Hydrogen fuel gas rooms shall be provided with mechanical exhaust ventilation in accordance with the applicable provisions of the *California Mechanical Code*.

**[F] 421.6 Gas detection system.** Hydrogen fuel gas rooms shall be provided with an approved flammable gas detection system in accordance with Sections 421.6.1 through 421.6.4.

**[F] 421.6.1 System design.** The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at their anticipated temperature and pressure.

**421.6.2 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

**[F] 421.6.3 Operation.** Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside of the *fuel gas room*.
2. Activation of the mechanical *exhaust* ventilation system.

**[F] 421.6.4 Failure of the gas detection system.** Failure of the gas detection system shall result in activation of the mechanical *exhaust* ventilation system, cessation of hydrogen generation and the sounding of a trouble signal in an approved location.

**[F] 421.7 Explosion control.** Explosion control shall be provided where required by Section 414.5.1.

**[F] 421.8 Standby power.** Mechanical ventilation and gas detection systems shall be connected to a standby power system in accordance with Chapter 27.

## SECTION 422 AMBULATORY CARE FACILITIES

**422.1 General.** Occupancies classified as ambulatory care facilities shall comply with the provisions of Sections 422.1 through 422.7 and other applicable provisions of this code.

**422.2 Separation.** Ambulatory care facilities where the potential for four or more care recipients are to be incapable of self-preservation at any time, whether rendered incapable by staff or staff accepted responsibility for a care recipient already incapable, shall be separated from adjacent spaces, corridors or tenants with a fire partition installed in accordance with Section 708.

**422.3 Smoke compartments.** Where the aggregate area of one or more ambulatory care facilities is greater than 10,000 square feet ( $929 \text{ m}^2$ ) on one story, the story shall be provided with a smoke barrier to subdivide the story into no fewer than two smoke compartments. The area of any one such smoke compartment shall be not greater than 22,500 square feet ( $2092 \text{ m}^2$ ). The travel distance from any point in a smoke compartment to a smoke barrier door shall be not greater than 200 feet (60 960 mm). The smoke barrier shall be installed in accordance with Section 709 with the exception that smoke barriers shall be continuous from outside wall to an outside wall, a floor to a floor, or from a smoke barrier to a smoke barrier or a combination thereof.

**422.4 Refuge area.** Not less than 30 net square feet ( $2.8 \text{ m}^2$ ) for each nonambulatory care recipient shall be provided within the aggregate area of corridors, care recipient rooms, treatment rooms, lounge or dining areas and other low-hazard areas within each smoke compartment. Each occupant of an ambulatory care facility shall be provided with access to a refuge area without passing through or utilizing adjacent tenant spaces.

**422.5 Independent egress.** A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

**[F] 422.6 Automatic sprinkler systems.** Automatic sprinkler systems shall be provided for ambulatory care facilities in accordance with Section 903.2.2.

**[F] 422.7 Fire alarm systems.** A fire alarm system shall be provided for ambulatory care facilities in accordance with Section 907.2.2.1.

## SECTION 423 STORM SHELTERS

**423.1 General.** In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC-500.

**423.1.1 Scope.** This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

**423.2 Definitions.** The following terms are defined in Chapter 2:

### STORM SHELTER.

Community storm shelter.

Residential storm shelter.

## SECTION 424 CHILDREN'S PLAY STRUCTURES

**424.1 Children's play structures.** Children's play structures installed inside all occupancies covered by this code that exceed 10 feet (3048 mm) in height and 150 square feet (14 m<sup>2</sup>) in area shall comply with Sections 424.2 through 424.5.

**424.2 Materials.** Children's play structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood complying with Section 2303.2.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m<sup>2</sup> when tested in accordance with

ASTM E 1354 at an incident heat flux of 50 kW/m<sup>2</sup> in the horizontal orientation at a thickness of 6 mm.

7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289, using the 20 kW ignition source. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's play structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

**[F] 424.3 Fire protection.** Children's play structures shall be provided with the same level of approved fire suppression and detection devices required for other structures in the same occupancy.

**424.4 Separation.** Children's play structures shall have a horizontal separation from building walls, partitions and from elements of the means of egress of not less than 5 feet (1524 mm). Children's playground structures shall have a horizontal separation from other children's play structures of not less than 20 feet (6090 mm).

**424.5 Area limits.** Children's play structures shall be not greater than 300 square feet (28 m<sup>2</sup>) in area, unless a special investigation, acceptable to the building official, has demonstrated adequate fire safety.

## SECTION 425 SPECIAL PROVISIONS FOR LICENSED 24-HOUR CARE FACILITIES IN A GROUP R-2.1, R-3.1, R-4 [SFM]

**425.1 Scope.** The provisions of this section shall apply to 24-hour care facilities in a Group R-2.1, R-3.1 or R-4 occupancy licensed by a governmental agency.

**425.2 General.** The provisions in this section shall apply in addition to general requirements in this code.

**425.2.1 Restraint** shall not be practiced in a Group R-2.1, R-3.1 or R-4 Occupancies.

**Exception:** Occupancies which meet all the requirements for a Group I-3 Occupancy.

**425.2.2 Pursuant to Health and Safety Code Section 13133, regulations of the state fire marshal pertaining to occupancies classified as Residential Facilities (RF) and Residential Care Facilities for the Elderly (RCFE) shall apply uniformly throughout the state and no city, county, city and county, including a charter city or charter county, or fire protection district shall adopt or enforce any ordinance or local rule or regulation relating to fire and panic safety which is inconsistent with these regulations. A city, county, city and county, including a charter city or charter**

county may pursuant to Health and Safety Code Section 13143.5, or a fire protection district may pursuant to Health and Safety Code Section 13869.7, adopt standards more stringent than those adopted by the state fire marshal that are reasonably necessary to accommodate local climate, geological or topographical conditions relating to roof coverings for Residential Care Facilities for the Elderly.

**Exception:** Local regulations relating to roof coverings in facilities licensed as a residential care facility for the elderly (RCFE) per Health and Safety Code Section 13133.

#### 425.3 Building height and area provisions.

**425.3.1** Group R-2.1, R-3.1 and R-4 shall be constructed in accordance with Table 503.

**425.3.2 Limitations six or less clients.** Group R-3.1 occupancies where nonambulatory clients are housed above the first story, having more than two stories in height or having more than 3,000 square feet ( $279 \text{ m}^2$ ) of floor area above the first story shall not be of less than one-hour fire-resistance-rated construction throughout.

In Group R3.1 occupancies housing a bedridden client, the client sleeping room shall not be located above or below the first story.

**Exception:** Clients who become bedridden as a result of a temporary illness as defined in Health and Safety Code Sections 1566.45, 1568.0832 and 1569.72. A temporary illness is an illness, which persists for 14 days or less. A bedridden client may be retained in excess of the 14 days upon approval by the Department of Social Services and may continue to be housed on any story in a Group R-3.1 occupancy classified as a licensed residential facility.

Every licensee admitting or retaining a bedridden resident shall, within 48 hours of the resident's admission or retention in the facility, notify the local fire authority with jurisdiction of the estimated length of time the resident will retain his or her bedridden status in the facility.

**425.3.3 Limitations seven or more clients.** Group R-4 occupancies where nonambulatory clients are housed above the first story and there is more than 3,000 square feet ( $279 \text{ m}^2$ ) of floor area above the first story or housing more than 16 clients above the first story shall be constructed of not less than one-hour fire-resistance-rated construction throughout.

**425.3.4 Nonambulatory elderly clients.** Group R-4 occupancies housing nonambulatory elderly clients shall be of not less than one-hour fire-resistance-rated construction throughout.

#### 425.4 Type of construction provisions.

**425.4.1** Group R-2.1, occupancies are not permitted in nonfire-resistance-rated construction, see Health and Safety Code Section 13131.5.

#### 425.5 Fire-resistance-rated construction provisions.

**425.5.1 Smoke barriers required.** Group R-2.1 and R-4 occupancies licensed as a Residential Care Facility (RCF) with individual floor areas over 6,000 square feet ( $557 \text{ m}^2$ ) per floor, shall be provided with smoke barriers, constructed in accordance with Section 709.

Group R-2.1 occupancies housing bedridden clients shall be provided with smoke barriers constructed in accordance with Section 709 regardless of the number of clients.

When smoke barriers are required, the area within a smoke compartment shall not exceed 22,500 square feet ( $2090 \text{ m}^2$ ) nor shall its travel distance exceed 200 feet (60 960 mm). Such smoke barriers shall divide the floor as equally as possible.

**425.5.2 Smoke partitions.** Group R-2.1 occupancies where smoke partitions are required, framing shall be covered with noncombustible materials having an approved thermal barrier with an index of not less than 15 in accordance with FM 4880, UL 1040, NFPA 286 or UL 1715.

**425.5.3 Independent egress.** At least two means of egress shall be provided from each smoke compartment created by smoke barriers. Means of egress may pass through adjacent compartments provided it does not return through the smoke compartment from which means of egress originated.

#### 425.6 Interior finish provisions.

**425.6.1 Interior wall and ceiling finish.** Group R-3.1 occupancies housing a bedridden client shall comply with interior wall and ceiling finish requirements specified for Group I-2 occupancies in Table 803.9.

**425.6.2 Safety padding.** Padding material used on walls, floors and ceilings in Group I and R-2.1 occupancies shall be of an approved type tested in accordance with the procedures established by State Fire Marshal Standard 12-8-100, Room Fire Test for Wall and Ceiling Materials, California Code of Regulations, Title 24, Part 12.

#### 425.7 Fire protection system provisions.

**425.7.1 Automatic sprinkler systems in Group R-2.1, R-3.1 and R-4 occupancies.** An automatic sprinkler system shall be installed where required in Section 903.

**425.7.2 Fire alarm systems in Group R-2.1 and R-4 occupancies.** An approved fire alarm system shall be installed where required in Section 907.

**425.7.3 Smoke alarms in Groups R-2.1, R-3.1 and R-4 occupancies.** Smoke alarms shall be installed where required in Section 907.2.11.2.

**425.7.4 Hearing impaired.** See Section 907.5.2.3.5.

#### 425.8 Means of egress provisions.

**425.8.1 General.** In addition to the general means of egress requirements of Chapter 10, this section shall apply to Group R-2.1, R-3.1 and R-4 occupancies.

**425.8.2 Number of exits.**

**425.8.2.1** Group R-2.1, R-3.1 and R-4 occupancies shall have a minimum of two exits.

**Exception:** Ancillary use areas or occupancies shall have egress as required by Section 1021.

**425.8.3 Egress arrangements.**

**425.8.3.1** Egress through adjoining dwelling units shall not be permitted.

**425.8.3.2 Group R-3.1 occupancies housing nonambulatory clients.** In a Group R-3.1 occupancy, bedrooms used by nonambulatory clients shall have access to at least one of the required exits which shall conform to one of the following:

1. Egress through a hallway or area into a bedroom in the immediate area which has an exit directly to the exterior and the corridor/hallway is constructed consistent with the dwelling unit interior walls. The hallway shall be separated from common areas by a solid wood door not less than  $1\frac{3}{8}$  inch (35 mm) in thickness, maintained self-closing or shall be automatic closing by actuation of a smoke detector installed in accordance with Section 716.5.9.
2. Egress through a hallway which has an exit directly to the exterior. The hallway shall be separated from the rest of the house by a wall constructed consistent with the dwelling unit interior walls and opening protected by a solid wood door not less than  $1\frac{3}{8}$  inch (35 mm) in thickness, maintained self-closing or shall be automatic closing by actuation of a smoke detector installed in accordance with Section 716.5.9.
3. Direct exit from the bedroom to the exterior shall be of a size as to permit the installation of a door not less than 3 feet (914 mm) in width and not less than 6 feet 8 inches (2032 mm) in height. When installed, doors shall be capable of opening at least 90 degrees and shall be so mounted that the clear width of the exit way is not less than 32 inches (813 mm).
4. Egress through an adjoining bedroom which exits to the exterior.

**425.8.3.3 Group R-3.1 occupancies housing only one bedridden client.** In Group R-3.1 occupancies housing a bedridden client and not provided with an approved automatic sprinkler system, all of the following shall apply:

1. In Group R-3.1 occupancies housing a bedridden client, a direct exit to the exterior of the residence shall be provided from the client sleeping room.
2. Doors to a bedridden client's sleeping room shall be of a self-closing, positive latching  $1\frac{3}{8}$  inch solid wood door. Such doors shall be provided with a gasket so installed as to provide a seal where the door meets the jam on both sides and across the top. Doors shall be maintained self-

closing or shall be automatic closing by actuation of a smoke alarm in accordance with Section 716.5.9.

3. Group R-3.1 occupancies housing a bedridden client, shall not have a night latch, dead bolt, security chain or any similar locking device installed on any interior door leading from a bedridden client's sleeping room to any interior area such as a corridor, hallway and or general use areas of the residence in accordance with Chapter 10.
4. The exterior exit door to a bedridden client's sleeping room shall be operable from both the interior and exterior of the residence.
5. Every required exit doorway from a bedridden client sleeping room shall be of a size as to permit the installation of a door not less than 3 feet (914 mm) in width and not less than 6 feet 8 inches (2032 mm) in height. When installed in exit doorways, exit doors shall be capable of opening at least 90 degrees and shall be so mounted that the clear width of the exit way is not less than 32 inches (813 mm).

**Note:** A sliding glass door can be used as an exterior exit doorway as long as it is operable from the inside and outside and the clear width of the exit way is not less than 32 inches (813 mm).

**425.8.3.4 Intervening rooms.** A means of exit shall not pass through more than one intervening room. A means of egress shall not pass through kitchens, storerooms, closets, garages or spaces used for similar purposes.

**Exception:** Kitchens which do not form separate rooms by construction.

**425.8.4 Corridors.**

**425.8.4.1** Unless specified by Section 425.8.4, corridors serving Group R-2.1 and Group R-4 occupancies shall comply with Section 1018.1.

**425.8.4.2** The minimum clear width of a corridor shall be as follows:

1. Group R-2.1 occupancies shall have 60 inches (1524 mm) on floors housing nonambulatory clients and 44 inches (1118 mm) on floors housing only ambulatory clients.
2. Group R-4 occupancies shall have 44 inches (1118 mm) on floors housing clients.

**Exceptions:**

1. Corridors serving an occupant load of 10 or less shall not be less than 36 inches (914 mm) in width.
2. Corridors serving ambulatory persons only and having an occupant load of 49 or less shall not be less than 36 inches (914 mm) in width.

In Group R-2.1 occupancies provided with fire sprinklers throughout and which are required to have rated corridors, door closers need not be installed on doors to client sleeping rooms.

**425.8.4.3** In a Group R-2.1 and Group R-4 occupancies having smoke barriers, cross-corridor doors in corridors 6 feet (1829 mm) or less in width shall have, as a minimum, a door 36 inches (914 mm) in width.

**425.8.5 Changes in level.** In Group R-3.1 occupancies housing nonambulatory clients interior changes in level up to 0.25 inch (6 mm) may be vertical and without edge treatment. Changes in level between 0.25 inch (6 mm) and 0.5 inch (12.7 mm) shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50 percent slope). Changes in level greater than 0.5 inch (12.7 mm) shall be accomplished by means of a ramp.

#### 425.8.6 Stairways.

**425.8.6.1** Group R-2.1 and Group R-4 occupancies housing more than six nonambulatory clients above the first floor shall be provided with two vertical exit enclosures. Stairway enclosures shall be in compliance with Section 1022. Exceptions to Section 1022 shall not apply in facilities licensed as a 24-hour care facility.

**425.8.6.2** Group R-3.1 occupancies may continue to use existing stairways (except for winding and spiral stairways which are not permitted as a required means of egress) provided the stairs have a maximum rise of 8 inches (203 mm) with a minimum run of 9 inches (229 mm). The minimum stairway width may be 30 inches (762 mm).

**425.8.7 Floor separation.** Group R-3.1 occupancies shall be provided with a nonfire resistance constructed floor separation at stairs which will prevent smoke migration between floors. Such floor separation shall have equivalent construction of 0.5 inch (12.7 mm) gypsum wallboard on one side of wall framing.

#### Exceptions:

1. Occupancies with at least one exterior exit from floors occupied by clients.
2. Occupancies provided with automatic fire sprinkler systems complying with Chapter 9.

**425.8.7.1 Doors within floor separations.** Doors within such floor separations shall be tight fitting solid wood at least  $1\frac{1}{8}$  inches (35 mm) in thickness. Door glazing shall not exceed 1296 square inches ( $32\ 918\ mm^2$ ) with no dimension greater than 54 inches (1372 mm). Such doors shall be positive latching, smoke gasketed and shall be automatic-closing by smoke detection.

**425.8.8 Fences and gates.** Grounds of a Residential Care Facility for the Elderly serving Alzheimer clients may be fenced and gates therein equipped with locks, provided safe dispersal areas are located not less than 50 feet (15 240 mm) from the buildings. Dispersal areas shall be sized to provide an area of not less than 3 square feet ( $0.28\ m^2$ ) per occupant. Gates shall not be installed across corridors or passageways leading to such dispersal areas unless they comply with egress requirements.

**425.8.9 Basement exits.** One exit is required to grade level when the basement is accessible to clients.

**425.8.10 Delayed egress locks.** See Section 1008.1.9.7.

**425.9 Request for alternate means of protection for facilities housing bedridden clients.** Request for alternate means of protection shall apply to Sections 425 through 425.9. Request for approval to use an alternative material, assembly or materials, equipment, method of construction, method of installation of equipment, or means of protection shall be made in writing to the local fire authority having jurisdiction by the facility, client or the client's authorized representative. Sufficient evidence shall be submitted to substantiate the need for an alternate means of protection.

The facility, client or the client's representative or the local fire authority having jurisdiction may request a written opinion from the State Fire Marshal concerning the interpretation of the regulations promulgated by the State Fire Marshal for a particular factual dispute. The State Fire Marshal shall issue the written opinion within 45 days following the request.

Approval of a request for use of an alternative material, assembly or materials, equipment, method of construction, method of installation of equipment, or means of protection made pursuant to this section shall be limited to Group R, 3.1 occupancies housing a bedridden client.

Approvals made by the local fire authority having jurisdiction and the written opinion by the State Fire Marshal shall be applicable only to the requesting facility and shall not be construed as establishing any precedent for any future request by that facility or any other facility.

**425.10 Temporarily bedridden clients.** Clients who become temporarily bedridden as defined in Health and Safety Code Section 1569.72, as enforced by the Department of Social Services, may continue to be housed on any story in Group R-2.1, R-3.1 or R-4 occupancies classified as Residential Care Facilities for the Elderly (RCFE). Every Residential Care Facility for the Elderly (RCFE) admitting or retaining a bedridden resident shall, within 48 hours of the resident's admission or retention in the facility, notify the local fire authority with jurisdiction of the estimated length of time the resident will retain his or her bedridden status in the facility.

## SECTION 426 GROUP I-4 [SFM]

**426.1 Group I-4 special provisions.** Rooms classified as Group I-4 shall not be located above or below the first story.

#### Exceptions:

1. Basements or stories having floor levels located within 4 feet (1219 mm), measured vertically, from adjacent ground level at the level of exit discharge, provided the basement or story has exterior exit doors at that level.
2. In buildings equipped with an automatic sprinkler system throughout, rooms used for kindergarten, first- and second-grade children or for day-care purposes may be located on the second story, pro-

vided there are at least two exterior exit doors, or other egress systems complying with Section 1017 with two exits, for the exclusive use of such occupants. Egress systems for the exclusive use of such occupants shall be maintained until exit discharge at grade is attained.

3. Group I-4 child-care facilities may be located above the first story in buildings of Type I construction and in Types II-A and III-A construction, subject to the limitation of Section 503 when:
  - 3.1. Group I-4 childcare facilities with children under the age of seven or containing more than 12 children per story shall not be located above the fourth floor; and
  - 3.2. The entire story in which the Group I-4 child-care facility is located is equipped with an approved manual fire alarm and smoke-detection system. (See the Fire Code.) Actuation of an initiating device shall sound an audible alarm throughout the entire story. When a building fire alarm system is required by other provisions of this code or the Fire Code, the alarm system shall be connected to the building alarm system. An approved alarm signal shall sound at an approved location in the Group I-4 child-care facility to indicate a fire alarm or sprinkler flow condition in other portions of the building; and
  - 3.3. Group I-4 child-care facilities, if more than 1,000 square feet ( $92.9\text{ m}^2$ ) in area, is divided into at least two compartments of approximately the same size by a smoke barrier with door openings protected by smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes. Smoke barriers shall have a fire-resistive rating of not less than one hour. In addition to the requirements of Section 508.3.3, occupancy separations between Group I-4 child-care and other occupancies shall be constructed as smoke barriers. Door openings in the smoke barrier shall be tightfitting, with gaskets installed as required by Section 710, and shall be automatic closing by actuation of the automatic sprinklers, fire alarm or smoke-detection system.
  - 3.4. Each compartment formed by the smoke barrier has not less than two exits or exit access doors, one of which is permitted to pass through the adjoining compartment; and
  - 3.5. Where two or more exits or exit access are required at least one shall not share a common path of travel.
  - 3.6. The building is equipped with an automatic sprinkler system throughout.

## SECTION 427 Reserved

## SECTION 428 Reserved

## SECTION 429 ROAD TUNNELS, BRIDGES, AND OTHER LIMITED-ACCESS HIGHWAYS [SFM]

**429.1 General.** Road tunnels, bridges, and other limited-access highways that are state owned shall comply with NFPA 502.

## SECTION 430 HORSE RACING STABLES [SFM]

**430.1** For automatic sprinkler and fire alarm system requirements applying to each building, barn or structure which is used by an association regulated by the California Horse Racing Board for the stabling of horses or human habitation, and the stable area grounds, including any additional location where any excess horses are stabled see Title 4, Division 4, Article 17, Section 1927.

## SECTION 431 PET KENNELS [SFM]

**431.1** These regulations shall apply to every building or fire area in which a pet dealer, as defined in Health and Safety Code Section 122125, maintains a kennel.

**431.2 Automatic sprinkler system.** An approved automatic sprinkler system complying with California Fire Code Section 903 shall be installed.

**Exception:** Where a fire alarm system that is connected to a central reporting station that alerts the local fire department in case of fire.

## SECTION 432 COMBUSTION ENGINES AND GAS TURBINES [SFM]

**432.1 General.** The installation of combustion engines and gas turbines shall be in accordance with NFPA-37 and this chapter.

### 432.2 Separation.

**432.2.1 Construction.** Every room in which is installed a combustion engine or gas turbine shall be separated from the remainder of the building by not less than a one-hour fire barrier.

**432.2.2 Exterior openings.** When doors, windows or louvered openings are located below openings in another story or less than 10 feet (3048 mm) from doors, windows or louvered openings of the same building, they shall be protected by a fire assembly having a  $\frac{3}{4}$ -hour rating. Such fire assemblies shall be fixed, automatic or self-closing.

**432.2.2.1 Interior openings.** In other than buildings housing Group I and R-2.1 occupancies, interior openings shall be allowed in buildings protected by an automatic fire sprinkler system throughout.

**432.2.3 Location.** Combustion engines and gas turbines used for emergency power shall not be located in a room or area used for any other purpose other than equipment

and controls related to the generation and distribution of emergency power.

**432.2.4 Special hazards.** The handling and use of flammable or combustible liquids shall comply with the California Fire Code.

## SECTION 433 FIXED GUIDEWAY TRANSIT SYSTEMS [SFM]

### 433.1 General.

**433.1.1 Scope.** The provisions of this section shall apply to buildings or structures defined as stations for fixed guideway transit systems and shall supersede other similar requirements in other sections of this code.

**433.1.2 Definitions.** For the purpose of this section, certain terms are defined as follows:

**AT-GRADE STATION.** Any at-grade or unroofed station other than an elevated or underground station.

**ELEVATED STATION.** A station greater than one story not otherwise defined as an at-grade or underground station.

**EMERGENCY MANAGEMENT PANEL (EMP).** The location where all necessary on-site control and communication facilities are consolidated for effective response to emergency situations.

**ENCLOSED STATION.** A station or portion thereof that does not meet the definition of an open station.

**ENGINEERING ANALYSIS (FIRE HAZARD/FIRE RISK ASSESSMENT).** An analysis that evaluates all various factors that affect the fire safety of the system or component. A written report of the analysis shall indicate the fire protection method(s) recommended that demonstrates a level of fire safety commensurate with this standard.

**FIXED GUIDEWAY TRANSIT SYSTEM (the system).** An automated driverless or manually controlled electrified transportation system, utilizing a fixed guideway, operating on right-of-way for the mass movement of passengers and consisting of its fixed guideways, transit vehicles and other rolling stock; power system; buildings; maintenance facilities; stations; transit vehicle yard; and other stationary and movable apparatus, equipment, appurtenances and structures.

**GUIDEWAY.** That portion of the system on which the transit vehicles operate.

**OPEN STATION.** A station that is constructed in such a manner that it is open to the atmosphere, and smoke and heat are allowed to disperse directly into the atmosphere. The following enclosed areas in open stations are permitted but limited to:

1. Ticket/pass booths not exceeding 150 square feet ( $13.9 \text{ m}^2$ ) in area.
2. Mechanical and electrical spaces typically not used for human occupancy and necessary for the operation of a fixed guideway transit system. Such spaces shall be limited to two per level.

3. Restrooms not exceeding 150 square feet ( $13.9 \text{ m}^2$ ) in area. A maximum of four restrooms are permitted per level.

**OPERATIONS CONTROL CENTER (OCC) (CENTRAL CONTROL).** The operation center where the authority controls and coordinates the system-wide movement of passengers and trains from which communication is maintained with supervisory and operating personnel of the authority, and with participating agencies when required.

**POINT OF SAFETY.** An enclosed fire exit that leads to a public way or safe location outside the structure, or an at-grade point beyond any enclosing structure, or other area that affords adequate protection for passengers.

**POWER SUBSTATION.** The location of electric equipment that does not generate electricity but receives and converts or transforms generated energy to usable electric energy.

**STATION.** A place designated for the purpose of loading and unloading passengers, including patron service areas and ancillary spaces associated with the same structure.

**STATION PLATFORM.** The area of a station used primarily for loading and unloading transit vehicle passengers.

**UNDERGROUND STATION.** A station or that part of a station located beneath the surface of the earth or of the water.

### 433.2 Types of Construction.

**433.2.1** Unless otherwise specified in this section, buildings or portions of buildings classed as stations of fixed guideway transit systems shall be minimum Type IA, Type IB or Type IIA construction and shall not exceed in area or height the limits specified in Table 503.

Underground stations shall be a minimum Type IA or Type IB constructions.

Open stations may be of Type IIB construction and shall not exceed in area or height as required by Table 503 for Type IIA.

**Exception:** At-grade structures of open stations with an occupancy load not exceeding 300 persons may be of any construction type permitted by this code.

### 433.2.2 Mixed occupancies.

**433.2.2.1** Stations of fixed guideway transit systems shall be separated from other occupancies in accordance with Table 508.4 for Group A Occupancies.

**433.2.2.2** The following areas shall be separated from public areas by a two-hour fire barrier:

1. Electrical control rooms, auxiliary electrical rooms and associated battery rooms
2. Trash rooms
3. Train control rooms and associated battery rooms
4. Fan rooms

5. Emergency generator rooms

**433.2.2.3** Within station structures, all power substations shall be separated from all other areas by a three-hour fire barrier with no openings to public areas.

**433.3 Access and exit facilities.**

**433.3.1 Occupant load.** The occupant load for a transit station shall be based on the emergency condition requiring evacuation of that station to a point of safety. The station occupant load shall be the sum of the number of persons in the calculated train load of trains entering a station plus the entraining load of persons awaiting train(s), during a specified time period. Notwithstanding, the minimum occupant load shall not be less than the maximum capacity load of a train which would occupy the entire length of the station platform on a single track. Existing shall be provided for occupant loads recalculated upon increase in service and/or every five years.

**433.3.1.1 Calculated train load.** The calculated train load is the number of passengers on trains simultaneously entering the station on all tracks in normal traffic direction during the peak 15-minute period.

The following limitations to the calculated train load shall be applied:

1. No more than one train will unload at any one track to a platform during an emergency.
2. The load on any single train is limited to the maximum train capacity.

**433.3.1.2 Entrainning load (on platform awaiting train).** The entraining load is equal to the number of passengers that would accumulate on the platform in the time period equivalent to two headways or 12 minutes during the peak 15-minute period, whichever time period is greater.

This entraining load is constrained as stated as follows:

1. Special consideration shall be given to stations servicing areas where events occur that establish occupant loads not included in normal passenger loads. These would include such areas as civic centers, sports complexes and convention centers.
2. At multiplatform stations, each platform shall be considered separately. Arrival of trains from all normal traffic directions, plus their entraining loads, shall be considered.
3. At concourses, mezzanines or multilevel stations, simultaneous platform loads shall be considered for all exit lanes passing through that area.

**433.3.2 Exits required.**

**433.3.2.1 Number of exits.** Stations shall have at least two exits placed a distance apart equal to not less than one half of the length of the maximum overall diagonal

dimension of the station. Enclosed station platforms shall have a minimum of one exit within 20 feet (6096 mm) from each end. Underground station platforms shall have a minimum of one enclosed exit within 20 feet (6096 mm) from each end. Routes from platform ends into the underground guideway shall not be considered as exits for calculating exiting requirements.

**433.3.2.2 Capacity of exits and station evacuation time.**

**433.3.2.2.1** Exit capacities shall be calculated on the basis of 22-inch-wide (559 mm) exit lanes at the clear and narrowest point except that individual handrails may project into the required width as permitted by Chapter 10. Fractional lanes shall not be counted in measuring exit capacities except that 12 inches (305 mm) added to one or more lanes shall be counted as one-half a lane. Escalators 32 inches (813 mm) in width may be considered as 1½ lanes.

**433.3.2.2.2** There shall be sufficient means of exit to evacuate the station occupant load from the station platforms in four minutes or less.

**433.3.2.2.3** The station shall also be designed to permit evacuation from the most remote point on the platform to a point of safety in six minutes or less.

**433.3.2.2.4** In at-grade or elevated structures so designed that the station platform is open to the elements and, when the concourse is below or protected from the platform by distance or materials as determined by an appropriate engineering analysis, that concourse may be defined as a point of safety, with Fire Code Official concurrence.

**433.3.2.2.5** To calculate evacuation time, the walking travel time should be tabulated using the longest exit route and travel speeds. To this time should be added the following factors:

1. The waiting time at the vertical elements at platform level minus the longest walking travel time at platform level.
2. The waiting time at the fare collection barriers minus the waiting time at the platform vertical circulation elements.
3. The waiting time at the vertical or horizontal circulation elements from mezzanine to grade minus the waiting time at the platform vertical circulation elements or fare collection barrier, whichever is greater.
4. The waiting time, if any, at any additional constriction minus the greatest previous waiting time. (Repeat for all additional constrictions.)

**Note:** The total of any of the factors in Items 1 through 4 above cannot be less than zero.

**433.3.3 Exit width and exit lanes.**

**433.3.3.1** The capacity in persons per minute (ppm), patron travel speeds in feet per minute (fpm) and requirements for exit lanes shall be as follows:

1. Platforms, corridors and ramps of 1 foot vertical for 20 feet horizontal (5 percent slope) or less: Exit corridors, platforms and ramps shall be a minimum clear width of 5 feet (1524 mm). In computing the number of exit lanes available, 1 foot 6 inches (457 mm) shall be deducted at each platform edge and 1 foot (305 mm) at each side wall.

Per exit lane:

Capacity – 50 ppm

Travel speed – 200 fpm

2. Stairs, stopped escalators and ramps of over 1 foot vertical for 20 feet horizontal (5 percent slope): Exit ramps shall be a minimum clear width of 6 feet (1829 mm). Stopped escalators may be considered as a means of egress, provided they are of nominal 2 feet 8 inches (813 mm) width.

Per exit lane “up” direction:

Capacity – 35 ppm

Travel speed – 50 fpm\*

Per exit lane “down” direction:

Capacity – 40 ppm

Travel speed – 60 fpm\*

3. Doors and gates: Gates fitted with approved panic hardware and opening in the direction of exit travel, with minimum nominal width of 3 feet (914 mm) shall be permitted in exit calculation.

Per doors and gate:

Capacity – 50 ppm per exit lane

4. Fare collection gates: Fare collection gates, when deactivated, shall provide a minimum 20 inches (508 mm) clear unobstructed aisle. Console shall not exceed 40 inches (1016 mm) in height.

Per gate:

Capacity – 50 ppm

**Note:** Examples of exiting analysis may be found in Appendix C of NFPA 130, 1995 edition, Standard for Fixed Guideway Transit Systems.

\*Indicates vertical component of travel speed.

**433.3.4 Arrangement of exits.**

**433.3.4.1** Vertical circulation elements shall be comprised of stairs or stair/escalator combinations. Escalators shall not account for more than half of the units of exit at any one level in the public area. Escalators must be paired in combination with stairs to be included in exiting capacity calculations.

**433.3.4.2** Because of the possibility of maintenance or malfunction, one escalator at each station shall be considered as being out of service in calculating egress requirements. The escalator chosen shall be that one having the most adverse effect on exiting capacities.

**433.3.5 Distance to exits.** No point of the station platform(s) or mezzanine(s) shall be more than 300 feet (91440 mm) from a point of safety.

**433.3.6 Other exits required/guideway access.**

**433.3.6.1** Access/egress between guideway and platforms shall be provided as follows:

1. Stairs or ramps, 2 feet 10 inches (864 mm) in width minimum, or other arrangement having equivalent capacity, shall be provided at each end of the platform, arranged to provide access/egress to guideway level.
2. Except in underground stations, the access points between the guideway and the platform, and the exit from the platform may be integrated.

**433.3.6.2** In enclosed stations, escalator and stairway enclosures are not required in the public areas of multilevel transit stations among platform, mezzanine and concourse when the station is provided with an emergency ventilation system.

**433.3.7 Emergency lighting and exit signs.**

**433.3.7.1** Emergency lighting and exit signs shall be provided in accordance with Chapter 10.

**Exception:** Open stations at grade need not provide emergency lighting or exit signs.

**433.4 Special provisions.**

**433.4.1 Automatic sprinkler system.** See Section 903.2.17.1.

**433.4.2 Station guideway deluge system.** See Section 903.2.17.1.

**433.4.3 Standpipe systems.** See Section 905.3.11.

**433.4.4 Emergency management panel (EMP).** An EMP shall be required for enclosed and underground stations. Location of the EMP shall be determined by the Fire Code Official. The EMP shall include but not be limited to the following:

1. Indication of manual pull boxes and automatic smoke detectors
2. Indication of alarm signals from all suppression systems
3. Capabilities for using station paging system
4. Emergency telephone
5. Escalator controls
6. Emergency ventilation controls
7. Station schematics

**433.4.5 Emergency ventilation systems.**

**433.4.5.1 General.** Emergency ventilation shall be provided for enclosed and underground stations for the

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protection of passengers, employees and emergency personnel.

**433.4.5.2** These systems shall be designed as follows:

1. A stream of noncontaminated air is provided to passengers in a path(s) of egress away from a train fire; and
2. Airflow rates produced toward a train fire in a path of egress are sufficient to prevent back layering of smoke; and
3. The temperature in a path of egress away from a train fire is limited to 140°F (60°C), or less; and
4. The design heat release rate produced by a train fire shall be used to design the emergency ventilation system.

**433.4.5.3** Ventilation shaft terminals at-grade shall be located to prevent recirculation as follows:

1. Openings for blast relief shafts, and under platform and smoke exhaust shafts at-grade shall be separated by a minimum horizontal distance of 40 feet (12 192 mm) from any station entrance, elevator hoistway enclosure, surface emergency stair doorway, unprotected outside air intake or other opening, or from each other. Exhaust outlets that are not used for intakes may be adjacent to each other.
2. Where this distance is not practical, the horizontal distance may be reduced to 15 feet (4572 mm) if the closest blast relief or under platform and smoke exhaust shaft terminal is raised a minimum of 10 feet (3048 mm) above the station entrance, emergency stair doorway and unprotected outside air intake or other opening, or the underplatform and smoke exhaust shaft terminal is raised a minimum of 10 feet (3048 mm) above the blast relief shaft terminal.
3. Ventilation of stations shall not terminate at grade on any vehicle roadway.

**433.4.5.4** Emergency ventilation fans.

**433.4.5.4.1** Ventilation fans used for emergency service, their motors, dampers and all related components exposed to the ventilation airflow shall be designed to operate in an ambient atmosphere of 482°F (250°C) for a period of at least one hour. Ventilation fans and related components shall be capable of withstanding the maximum anticipated plus/minus pressure transients induced by train operations.

**433.4.5.4.2** Local fan motor starters and related operating control devices for emergency ventilation equipment shall be isolated from the ventilation airflow by a separation having a fire-resistance rating of at least one hour.

**433.4.5.4.3** Thermal overload protective devices shall not be provided on motor controls of fans used for emergency ventilation.

**433.4.5.4.4** The power supply for fans essential for emergency ventilation service shall consist of two separate electrical feeders. Each feeder shall originate from a different source (substation) and shall be separated physically to the extent possible. Automatic transfer shall be provided in the event the normal supply source fails.

**433.4.5.4.5** Operation and fail-safe verification for proper operation of emergency fans shall be affected from the operation control center with indication provided for all modes of operation for each fan.

**433.4.5.5** Emergency ventilation control.

**433.4.5.5.1** Local controls shall override remote control. Local control shall be capable of operating the fans in all modes in the event the remote controls become inoperative.

**433.4.5.5.2** Emergency ventilation systems shall be supervised and/or controlled in all operating modes locally (motor control center and/or fan unit) and remotely at both the OCC and the station EMP.

**433.4.5.5.3** Fan running shall be provided by sensing devices for each fan for operation in both the supply and exhaust directions.

**433.4.5.5.4** Trouble status signals shall be announced in the local control room. A summarized trouble signal shall be announced at OCC and EMP.

**433.4.5.6** Ventilation systems and ancillary areas. Ancillary area ventilation systems shall be arranged so that air is not exhausted into station public occupancy areas.

**433.5** Fire Alarm and Communication Systems. See Section 907.2.26.

## SECTION 434 EXPLOSIVES [SFM]

**434.1** General construction requirements. Magazines shall be constructed in conformity with the provisions of these regulations, or may be of substantially equivalent construction satisfactory to the enforcing agency having jurisdiction. Reasonable allowances shall be made for storage facilities in existence prior to the adoption of these regulations. No allowance, however, shall be made for storage facilities which constitute a distinct hazard to life and property.

**434.2** Ventilation and weather resistance. Magazines for the storage of explosives shall be sufficiently ventilated and weather resistant and when used for the storage of Class A explosives (other than black powder, blasting agents, blasting caps and electric blasting caps), they shall also be of bullet-resistant construction unless deemed exempt by the enforcing agency having jurisdiction.

**Note:** The recommendation for ventilation as contained in Pamphlet No. 1, Institute of Makers of Explosives, 1965 edition, is evidence of good practice.

**434.3 Construction for separation between primers and flammable liquids.** Primers shall be separated from flammable liquids by a one-hour fire-resistive occupancy separation.

**Exception:** A separation need not be provided for small arms ammunition primers when such primers are located a distance of not less than 25 feet (7620 mm) from flammable liquids.

**434.4 Construction of Type I Magazine.** Type I magazines shall be of bullet-resistant construction. Plans shall be submitted to the enforcing agency having jurisdiction for approval prior to construction.

**434.4.1 General.** Use of the following materials and methods of construction shall be evidence of compliance with this requirement:

1. Masonry units not less than 8 inches (203 mm) in thickness with all hollow spaces filled with weak cement, well-tamped sand, or equivalent material; or
2. Reinforced concrete not less than 6 inches (152 mm) in thickness; or
3. Steel walls of minimum No. 14 manufacturers. Standard gage (0.0747 inch) (1.9 mm) to No. 6 manufacturers. Standard gage (0.1943 inch) (4.9 mm) may be used, provided there are two layers spaced at least 6 inches (152 mm) apart with all hollow spaces filled with weak cement, well-tamped sand or equivalent material; or
4. One layer of No. 6 manufacturer's standard gage (0.1943 inch) (4.9 mm) or heavier; steel lined on the interior with a minimum of 4 inches (102 mm) of wood; or
5. Two layers of No. 6 manufacturer's standard gage (0.1943 inch) (4.9 mm) or heavier steel spaced a minimum  $\frac{1}{2}$  inch (12.7 mm) apart and lined on the interior with a minimum of 2 inches (51 mm) of wood; or
6. Two layers of wood, at least 2 inches (51 mm) nominal thickness each, spaced a minimum 4 inches (102 mm) apart with the hollow space filled with weak cement, well-tamped sand or equivalent material.
7. Wood used shall conform to the following:

Wood shall be of tongue-and-grooved lumber or plywood. Wood shall be covered, on the exterior side, with metal to provide protection against flying embers and sparks.

**434.4.2 Doors.** Doors shall be of bullet-resistant construction. Each door is to be equipped with:

1. Two mortise locks;
2. Two padlocks fastened in separate hasps and staples;
3. A combination of a mortise lock and a padlock;
4. A mortise lock that requires two keys to open; and
5. A three-point lock.

Padlocks must have at least five tumblers and a case-hardened shackle of at least  $\frac{3}{8}$  inch (9.5 mm) diameter. Padlocks must be protected with not less than  $\frac{1}{4}$  inch (6.4 mm) steel hoods constructed so as to prevent sawing or lever action on the locks, hasps and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock or bar that cannot be actuated from the outside.

**434.4.3 Floors.** Floors of magazines shall be securely fastened in place and shall be capable of withstanding the loads imposed.

**434.4.4 Roofs.** Roofs shall be securely fastened in place and they shall be bullet resistant, if required by the fire chief having jurisdiction.

**434.4.5 Ventilation openings.** Ventilation openings shall be screened to prevent the entrance of sparks and they shall be protected in a manner that will maintain the bullet resistance of the magazine.

**434.4.6 Interiors.** Magazine interiors shall be of a smooth finish without cracks or crevices with all nails, screws, bolts and nuts countersunk. Exposed metal capable of emitting sparks shall be covered so as not to come in contact with packages of explosives.

**434.4.7 Location.** No Type I magazine, or portion thereof, shall be located under a high-voltage power line (750 volts or more). For the purposes of this section, "under" shall include an open space of not less than the height of the power line from the ground at right angles to the walls of the magazine.

**434.5 Buildings used for mixing of blasting agents.** Buildings used for the mixing of blasting agents shall conform to the requirements of Sections 434.5 and 434.6, unless otherwise specifically approved by the enforcing agency having jurisdiction.

**434.5.1 Construction.** Buildings shall be of all noncombustible construction or of sheet metal on wood studs.

**434.5.2 Separation.** The layout of the mixing building shall be such so as to provide physical separation between the finished product storage and the mixing and packaging operations.

**434.5.3 Storage areas.** Floors in storage areas and in the processing plant shall be of concrete or other noncombustible material. Isolated fuel storage shall be provided to avoid contact between molten ammonium nitrate and fuel in case of fire.

**434.5.4 Ventilation.** The building shall be well ventilated in accordance with Section 434.2.

**434.5.5 Heat.** Heat, if used, shall be provided exclusively from a unit outside of the building.

**434.5.6 Venting.** Explosion venting shall be provided when required by the enforcing agency having jurisdiction.

**434.6 Building construction storage.** Blasting agents may be stored in the manner set forth in Title 19, California Code of

Regulations, Subchapter 10, Article 3, or in one-story warehouses (without basements), which shall be:

1. Of noncombustible or one-hour fire-resistive construction;
2. Constructed so as to eliminate floor drains and piping into which molten materials could flow and be confined in case of fire;
3. Weather resistant;
4. Well ventilated in accordance with Section 434.2; and
5. Equipped with a substantially constructed and lockable door which shall be kept securely locked, except when the facility is open for business.

**434.7 Electrical requirements for Type I magazines.** Magazines shall not be provided with either heat or light, except upon the approval of the enforcing agency having jurisdiction. Electrical installation, when permitted, shall be in accordance with the California Electrical Code for Type II, Division I locations.

**434.8 Mixing room blasting agents.** All electrical switches, controls, motors and lights, if located in the mixing room, shall be installed in accordance with the California Electrical Code for Type II, Division I locations.

**434.9 Storage of special effects materials.** The storage of not more than 750 pounds (340 kg) of special effects materials shall be in a building or a room conforming to the requirements of Group H, Division I Occupancies as defined in this part. In addition, the following shall apply to every special effects materials storage building or room:

1. The building shall be sprinklered as required in Chapter 9.
2. It shall be deemed that the storage of special effects materials creates an atmosphere of flammable dust.
3. Two or more permanent openings having an area of not less than 100 square inches ( $64.5 \text{ mm}^2$ ) shall be located in the exterior wall to provide natural ventilation. These openings shall be protected by screens or louvers covered with  $\frac{1}{4}$ -inch (6.4 mm) wire mesh screen.
4. Walls, floor ceiling, shelves and benches shall have a smooth nonmetallic surface which can be easily cleaned with a minimum of brushing or scrubbing.
5. Each entrance door shall be posted on the outside with signs stating, "Authorized Personnel Only" and "No Smoking."
6. Assembling and manufacturing are prohibited in special effects storage rooms or buildings.
7. The room shall be located above grade in a one-story building or on the top floor of a multistory building or may be a separate building.
8. The room or building shall have a minimum floor area of 80 square feet ( $7.4 \text{ m}^2$ ) with no dimension less than 8 feet (2438 mm).
9. Electric wiring, lighting and heating shall be of a type approved for use in hazardous locations.

**434.10 Mixing room or building.** Buildings or rooms in which more than 50 pounds (22.7 kg) of special effects materials are present at any time shall be constructed with at least one wall of explosion-relief type. The relief wall should be placed so as to be of least hazard to persons in adjacent buildings.

**434.10.1 Explosive venting.** When explosive venting is required, the venting area will be calculated on 1 square foot ( $0.0929 \text{ m}^2$ ) for each 35 cubic feet ( $0.99 \text{ m}^3$ ) of building or roof area.

**434.10.2 Egress.** All rooms or buildings shall have adequate aisle space and at least two exits separated by a distance equal to at least one-fifth the perimeter of the room. Openings in fire walls shall be equipped with approved, self-closing fire doors. All exit doors shall open outward and be equipped with approved panic hardware.

**Exception:** Cubicles 100 square feet ( $9.3 \text{ m}^2$ ) or less and occupied by not more than two persons working within 12 feet (3658 mm) of an unobstructed passageway may have one exit.

**434.10.3 Room finishes.** Floors, walls, interior surfaces and equipment shall be of a finish and color that will indicate the presence of dust and spilled material. They shall be smooth finished for easy cleaning.

**434.10.4 HVAC.** Heating and cooling shall be by the indirect method using water, steam, electric heaters or other indirect methods.

**Note:** Floor registers shall not be permitted.

**434.10.5 Electrical.** All electrical wiring and equipment shall be acceptable for the hazard involved and installed in accordance with Hazardous Locations, California Electrical Code.

**434.10.6 Grounding.** Effective bonding and grounding means shall be provided to prevent accumulation of static charges where static charges are a hazard, as set forth in the California Electrical Code.

**434.10.7 Pressure relief valves.** Hydraulic or air presses and hand jacks shall be provided with pressure-relief valves so arranged and set that the material being processed will not be subjected to pressure likely to cause it to explode. Dies and plugged press equipment shall not be cleared by striking blows that may detonate or start the material burning.

**434.10.8 Dust control.** Dust from special effects materials shall not be exhausted to the atmosphere. Where vacuum dust collections systems are used, they shall comply with the following requirements:

1. Adequate filters must be installed between the source vacuum and the point of pickup to prevent explosive special effects materials from entering the vacuum pump or exhauster.
2. The dust-collection system shall be designed to prevent pinch points threaded fittings exposed to the hazardous dust and sharp turns, dead ends, pockets, etc., in which special effects materials may lodge and accumulate outside the collecting chamber.

3. The entire vacuum collection system shall be made electrically continuous and be grounded to a maximum resistance of 5 ohms.
4. Chambers in which the dusts are collected shall not be located in the operating area unless adequate shields for the maximum quantity of material in the collector are furnished for personnel protection.
5. No more than two rooms may be serviced by a common connection to a vacuum collection chamber. Where interconnections are used, means should be employed to prevent propagation of an incident via the collection piping.
6. When collecting the more sensitive special effects materials, such as black powder, lead azide, etc., a "wet" collector which moistens the dust close to the point of intake and maintains the dust wet until removed for disposal shall be used. Wetting agents shall be compatible with the explosives.
7. Dusts shall be removed from the collection chamber as often as necessary to prevent overloading. The entire system shall be cleaned at a frequency that will eliminate hazardous concentrations of dusts in pipes, tubing and/or ducts.

**434.10.9 Fans.** Squirrel cage blowers should not be used for exhausting hazardous fumes, vapors or gases. Only nonferrous fan blades are permitted for fans located within the ductwork and through which hazardous materials are exhausted. Motors shall be located outside the duct.

**434.10.10 Work stations.** Work stations for small amounts of special effects materials [less than 1 pound (0.454 kg)] shall be separated by distance, barrier or other means, so fire in one station will not ignite material in the next work station. When necessary, each operator shall be protected by a personnel shield located between the operator and the material being processed. This shield and its support shall be a test design to withstand a blast from the maximum amount of special effects materials allowed behind it.

**434.10.11 Shielding.** When shields or structures are needed to protect personnel, the following requirement shall be followed when specific weights of special effects materials in the amount of 1 pound (0.454 kg) or more are involved:

Weight of Explosive	Structure of Shield Wall
1-15 pounds (0.454-6.8 kg)	Shield wall constructed of concrete not less than 12 inches (305 mm) thick which is reinforced near both sides by rods not less than $\frac{1}{2}$ inch (12.7 mm) in diameter located on maximum centers of 12 inches (305 mm) both horizontally and vertically. The rods must be staggered on opposite faces.
More than 15 pounds (6.8 kg)	The shield wall for the protection of workers must be designed in such a manner to protect against the efforts of not less than 25 percent overload above the expected maximum charge to be processed.

#### Notes:

1. One inch (25 mm) of mild steel is equivalent to 1 foot (305 mm) of reinforced concrete.
2. Explosives shall be located not less than 36 inches (914 mm) from the wall and 24 inches (610 mm) above the floor.

If this personnel protection wall for the required operation involving large quantities of special effects materials becomes so large that it is impractical, the operator must perform the operations by remote control or be protected by a suitably constructed shelter designed with a safety factor of not less than 4 to withstand the overpressure from the maximum amount of explosives in process.

## SECTION 435 RESERVED

## SECTION 436 WINERY CAVES [SFM]

**436.1 Scope.** The use of subterranean space for winery facilities in natural or manmade caves shall be in accordance with this section.

### 436.2 Definitions.

**436.3 General.** For definitions of ASSEMBLY, FIRE APPLIANCE and NONCOMBUSTIBLE, see Chapter 2.

**436.4 Limited application.** For the purpose of Section 436, certain terms are defined as follows:

**TYPE 1 WINERY CAVES** are natural or manmade caves used solely for storage and/or processing of wine at a winery facility. Type 1 winery caves are not accessible to the public.

**TYPE 2 WINERY CAVES** are natural or manmade caves used for the storage and/or processing of wine at a winery facility. Type 2 winery caves are accessible to the public on guided tours only.

**TYPE 3 WINERY CAVES** are natural or manmade caves used for the storage and/or processing of wine at a winery facility. Type 3 winery caves are accessible to the public on guided tours and contain assembly use areas.

**436.5 Permits.** For permits to operate Type 2 and 3 winery caves, see Section 105.

**436.6 Fire apparatus access roads.** Fire apparatus access roads shall be constructed and maintained in accordance with the California Fire Code, Section 503.

### 436.7 Construction requirements.

**436.7.1 Allowable area.** The area of winery caves shall not be limited if constructed entirely of noncombustible materials. Winery caves constructed with combustible materials shall be limited in area so that no point is more than 150 feet (45 720 mm) from an exit.

**436.7.2 Interior construction.** The walls and ceilings of winery caves shall not contain hidden or concealed spaces.

### 436.8 General requirements.

**436.8.1 Public tours.** Tours for the public shall be continuously guided by staff knowledgeable in the location of exits and the use of emergency notification devices.

**436.8.2 Standby personnel.** Per the California Fire Code, Section 2404.20, when, in the opinion of the fire chief, it is essential for public safety, the owner, agent or lessee shall employ one or more qualified persons, as required and approved by the chief, to be on duty at such place. Such individuals shall be in uniform or otherwise easily identifiable.

Standby personnel shall be subject to the fire chief's orders at all times when so employed and shall remain on duty during the times such places are open to the public or when such activity is being conducted.

Before the start of any activity requiring standby personnel, such individuals shall:

1. Inspect the required fire appliances to ensure they are in the proper place and in good working order.
2. Inspect all exits to verify accessibility and proper operation.

While on duty, such individuals shall not be required or permitted to perform any duties other than those specified by the fire chief.

**436.8.3 Open-flame devices.** The use of candles and other open-flame devices shall be in accordance with California Fire Code Section 308.1.7.

**436.9 Portable fire extinguishers and other fire appliances.** Portable fire extinguishers shall be located to be readily accessible. Its type, location and spacing throughout the facility shall be in accordance with the provisions of Title 19, Chapter 3 and California Fire Code Section 906.1. Other fire appliances shall be maintained at the site as required by the fire chief.

**436.10 Fire alarm systems.** An approved manual fire alarm system conforming with the provisions of the California Fire Code, Section 907.2.1 shall be provided in all Type 3 winery caves.

#### **436.11 Exits.**

**436.11.1 Distribution.** Exits shall be located remotely from each other and arranged to minimize any possibility that more than one may be blocked off by any one fire or other emergency condition.

**436.11.2 Number.** Winery caves shall be provided with a minimum of two exits.

Assembly areas of Type 3 winery caves shall be provided with exits as required by the California Building Code for Group A Occupancies.

#### **436.12 Exit illumination.**

**436.12.1 General.** Exits shall be illuminated to a minimum intensity of not less than 1 foot-candle (10.76 lx) at floor level whenever the winery cave is occupied. Fixtures providing exit illumination shall be supplied from a dedicated circuit or source of power used only for exit illumination.

**436.12.2 Separate sources of power.** The power supply for exit illumination may be provided by the premises' wiring system. In the event of its failure, illumination shall be automatically provided from an emergency system in Types 2 and 3 winery caves. Emergency systems shall be supplied from storage batteries or an on-site generator set, and the system shall be installed in accordance with the requirements of the California Electrical Code.

**436.13 Exit signs.** Exit signs shall be installed at required exits and where otherwise necessary to clearly indicate the exits from assembly areas in Type 3 winery caves.

**436.14 Maximum occupant load.** Occupant load requirements in the assembly areas of Type 3 winery caves shall be in accordance with Section 1004.

**436.15 Seating arrangements.** Seating arrangements in the assembly areas of Type 3 winery caves shall be in accordance with California Fire Code, Section 1028.9.

### **SECTION 437 RESERVED**

### **SECTION 438 RESERVED**

### **SECTION 439 PUBLIC LIBRARIES [SL AND SFM]**

Public libraries funded from the California Library Construction and Renovation Act of 1988.

**439.1 Automatic sprinkler system.** Automatic sprinkler systems shall be installed in:

1. New facilities, including additions;
2. Existing facilities to which a project adds the lesser of 5,000 square feet ( $465\text{ m}^2$ ) or 10 percent of the size of the existing facility, if the existing facility does not already have an automatic sprinkler system.

**439.2 System monitoring requirement.** All fire protection systems shall be monitored by a fire alarm supervising station in accordance with the NFPA 72.

**439.3 Book return slots.** Any interior book return with a slot piercing the exterior wall shall have a separate sprinkler head and be enclosed in fire-rated construction.

**439.4 Automatic sprinkler and extinguishing systems.** For public libraries constructed with funds awarded under the California Reading and Literacy Improvement and Public Library Construction and Renovation Bond Act of 2000:

1. **Fire sprinkler system requirement.** All libraries funded for new construction, including additions, shall have automatic fire sprinkler systems installed.
2. **Fire sprinkler system requirement for renovations of existing facilities.** If there is no automatic fire sprinkler system in the existing facility, grant recipients shall be required to install a fire sprinkler system throughout the existing facility.

- 3. Fire sprinkler system types.** The grant recipient may choose, on approval by the local fire authority, from wet-pipe, dry-pipe or pre-action systems, utilizing listed standard, early suppression fast response (ESFR), or on/off type sprinkler heads.
- 4. Book return rooms and slots.** Book return rooms with slots in exterior walls shall have an automatic sprinkler head and be of approved fire-resistive construction. Book return slots and book drops shall have an additional automatic sprinkler head when shielded from the room sprinkler head.
- 5. System monitoring requirement.** All fire protection systems shall be monitored by a fire alarm supervising station in accordance with the National Fire Protection Association (NFPA) 72.
- 6. Alternate fire-extinguishing systems for specialized areas.** When approved by the fire authority having jurisdiction, other types of approved automatic fire-extinguishing systems may be utilized as an alternate to sprinklers in the following areas: rare book rooms, central computer rooms and telecommunication rooms.
- 7. Automatic sprinkler system plan requirement.** Fire sprinkler system drawings shall use the furniture plan as a background for coordination with furniture and book stack location and height.

## SECTION 440 GROUP C [SFM]

### 440.1 Group C Occupancies defined.

**440.1.1 Organized camps.** For the purposes of these regulations, Group C Occupancies shall mean “organized camps” as defined in Section 18897, Health and Safety Code.

**440.1.1.1 Description.** An organized camp is a site with programs and facilities established for the primary purpose of providing an outdoor group living experience with social, spiritual, educational or recreational objectives, for five days or more during one or more seasons of the year.

The term “organized camp” does not include a motel, tourist camp, trailer park, resort, hunting camp, auto court, labor camp, penal or correctional camp, child-care institution or home-finding agency nor does it include any charitable or recreational organization which complies with the rules and regulations for recreational trailer parks provided for by Section 18301 (b), Health and Safety Code.

**440.1.2 Tents and tent structures.** For the purpose of this chapter, a tent or tent structure is defined as any shelter of which 25 percent or more of the walls or roof, or both, are constructed of, or covered or protected by, a canvas or any other fabric material.

**440.2 Purpose and intent.** The provisions of this section are established to provide fire and life safety in organized camps, but at the same time preserve the basic concept of outdoor

living. It is the intent of this section that organized camps shall be considered as a separate and distinct occupancy.

### 440.3 Basic building and structures.

**440.3.1 Building classification.** Every building or structure shall be classified into the occupancy group they most nearly resemble and be constructed in accordance with appropriate occupancy requirements specified in this part.

#### Exceptions:

1. Tents, tent structures, and buildings and structures that do not exceed 25 feet (7620 mm) in any lateral dimension and where such building or structure is not more than one story.
2. For fire safety, buildings or structures on the premises of an organized camp which are used for sleeping purposes, regardless of their similarity to other occupancy groups, shall conform to the provisions of Sections 440.4, 440.5, 440.6 and 440.7.
3. For fire safety, buildings and structures which are not used for sleeping purposes shall conform to the provisions of Section 440.7, which shall supersede any similar provisions contained in this part.

**440.3.2 Occupant load.** The living shelter whether a building, structure, tent and tent structure, or cabin, shall provide a minimum of 30 square feet ( $2.8 \text{ m}^2$ ) of superficial floor area per person for single-tier bed units, and 20 square feet ( $1.9 \text{ m}^2$ ) of superficial floor area per person for two-tier bed units. More than two tiers per bed unit are prohibited. There shall be at least 3 feet (914 mm) of lateral distance between beds

**Exception:** Intermittent short-term organized camps are not required to provide shelter facilities but, if provided, they shall comply with this section.

### 440.4 General.

**440.4.1 Buildings intended for sleeping.** Buildings and structures used or intended for sleeping purposes which do not exceed any one of the limitations set forth below shall conform to the provisions of Sections 440.5 and 440.7.

1. One story in height
2. Twenty-five feet (7620 mm) in any lateral dimension

**Exception:** This provision shall not apply to buildings or structures conforming to construction provisions of this section in effect prior to January 1, 1985.

3. Maximum housing of 12 persons

**440.4.2 Limitations.** Buildings and structures used or intended for sleeping purposes, including those so used in whole or in part by staff personnel, and which exceed any one of the limitations set forth in Section 440.4.1, shall conform to the provisions of Sections 440.5 and 440.7.

**Exception:** Buildings or structures used exclusively for living and sleeping purposes by resident custodial or

*caretaker personnel only may be constructed in accordance with the provisions of these regulations for a Group R, 3 Occupancy.*

**440.5 Special buildings, tents and tent structures.**

**440.5.1 Special buildings.** In addition to the provisions of Section 440.7, special buildings conforming to the limitations specified in Section 440.4.1 shall conform to the following:

1. The flame-spread end-point rating of all interior finish materials shall not exceed 200.
2. Every room or area housing more than eight persons shall be provided with not less than two approved exits, each of which shall be direct to the exterior and shall not be less than 32 inches (813 mm) in clear width and 6 feet 8 inches (2032 mm) in height. Rooms or areas housing eight or less persons shall be provided with at least one such exit direct to the exterior.
3. Every exit door shall be openable from the inside without the use of any key, special knowledge or effort.
4. Exit doors need not be hung to swing in the direction of exit travel. Where exit doors are hung to swing in the direction of exit travel, a landing conforming to the provisions of Section 1008.1.5 shall be provided.
5. When the distance (measured vertically) between the ground level and the floor level exceeds 8 inches (203 mm), a stairway from each exit shall be provided. Steps shall have a rise of not more than 8 inches (203 mm) and a run of not less than 9 inches (229 mm). Such stairway shall be at least as wide as the door it serves.

**Exception:** In lieu of a stairway, a ramp having a slope of not more than 1 foot (305 mm) of rise for each 8 feet (2438 mm) of run may be provided.

6. When the floor level at any door opening of any building or structure is more than 30 inches (762 mm) above the adjacent ground level, handrails or guardrails shall be provided on the landing, balcony or porch, and on every stairway or ramp to ground level.
7. Buildings and structures or groups of buildings and structures shall be separated from each other by not less than 10 feet (3048 mm). This section shall not apply to existing buildings and structures of existing Group C Occupancies.

**440.5.2 Tents and tent structures.** In addition to the provisions of Section 440.7, tents and tent structures, or groups thereof, shall conform to the provisions of Section 440.5, except as follows:

1. Regardless of any other provisions of this section, heating of tents and tent structures shall be prohibited unless written permission is obtained from the fire chief.

2. All canvas or other fabric material shall be treated and maintained in a flame-retardant condition.

**Exceptions:**

1. Tents in existence prior to January 1, 1979, provided the following conditions are met:
  - 1.1. Tents shall not exceed 80 square feet ( $7.4\text{ m}^2$ ) in area.
  - 1.2. No electrical devices, except flashlights, are installed or used in the tents.
  - 1.3. Tents are not located closer than 30 feet (9144 mm) to any open fire.
  - 1.4. Smoking is prohibited in the tents.
  - 1.5. All other applicable provisions of this article are met.
2. Canvas or materials used exclusively to protect windows and similar openings in walls.
3. Canvas or materials used as a windbreak enclosure of not more than three sides and open to the sky.

**Note:** It is not the intent of Section 440.5.2 that strict adherence to the width and height requirements of exit openings be enforced for exits from tents.

**440.6 Building and structures for sleeping.** Buildings and structures, or portions thereof, used or intended for sleeping purposes and which exceed the height, area or capacity limitations specified in Section 440.4.1 shall conform to the provisions of this section.

**440.6.1 Area, height and type of construction.** Buildings and structures, or portions thereof, shall not exceed the limits of area, height and type of construction specified in these regulations for a Group R-2.1 occupancy. Such buildings and structures shall not be of less than one-hour fire-resistive construction throughout.

**440.6.2 Location on property.** The fire-resistive protection of exterior walls and openings, as determined by location on property, shall be in accordance with the provisions of these regulations for a Group R-2.1 occupancy.

**440.6.3 Exits.** Stairs, exits and smoke-proof enclosures shall be provided in accordance with the provisions of Chapter 10.

**440.6.4 Enclosure of vertical openings.** Exits shall be enclosed as specified in Chapter 10. Elevator shafts, vent shafts and other vertical openings shall be enclosed and enclosures shall be as set forth in Chapter 7.

**440.6.5 Fire-extinguishing systems.** Automatic fire-extinguishing systems, standpipes, and basement pipe inlets shall be installed when and as specified in Chapter 9 for buildings, based on the occupancy they most nearly resemble.

**440.6.6 Automatic fire alarm system.** See Section 907.

**440.7 Special requirements.** The provisions of this section shall apply to the premises and to all buildings and structures of all organized camps.

**440.7.1 Electrical.** The installation of all electrical wiring shall conform to the applicable provisions of the California Electrical Code.

**440.7.2 Heating equipment.** Heating equipment, and the installation thereof, shall conform to the provisions of the California Mechanical Code.

**440.7.3 Motion picture booths.** Motion picture machine booths shall conform to the requirements of Section 409.

**440.7.4 Interior finish.** Interior finish shall conform to the requirements of Chapter 8, except as permitted in Section 440.5.1, Item 1.

**440.7.5 Heater room openings.** All exterior openings in rooms containing central heating equipment, low-pressure boilers or water-heating boilers used as part of the heating system, if located below openings in another story, or if less than 10 feet (3048 mm) from other doors or windows of the same building, shall be protected by a fire assembly having a three-fourths-hour fire-resistive rating. Such fire assemblies shall be fixed, automatic or self-closing.

**Exception:** The requirement for three-fourths-hour fire assembly protection of openings may be deleted if the entire room is protected by an automatic sprinkler system conforming to the provisions of Section 903.

**440.7.6 Heating rooms.** Every room containing central-heating equipment, low-pressure boiler or water-heating boiler used as part of the heating system shall be separated from the rest of the building by a one-hour fire-resistive fire barrier with all openings protected as set forth in Section 707.6.

#### Exceptions:

1. Boilers or central heating plants where the largest piece of fuel equipment does not exceed 400,000 Btu per hour (135 kW) input.
2. When any such opening is protected by a pair of fire doors, the inactive leaf shall be normally secured in the closed position and shall be openable only by use of a tool. An astragal shall be provided and the active leaf shall be self-closing.

**440.7.7 Exits.** For purposes of determining occupant load for exit requirements, see Section 440.3.2.

**440.7.8 Liquefied petroleum gas.** The construction and installation of all tanks, cylinders, equipment and systems used or intended for use in conjunction with any liquefied petroleum gas shall conform to the provisions of the California Mechanical Code and the California Fire Code.

**440.7.9 Air-conditioning and ventilation systems.** Heating units used as an integral part of an air-conditioning and ventilation system shall be installed in accordance with Sections 440.7.2, 440.7.3 and 440.7.6.

**440.8 Camp fire alarm.** Every organized camp shall provide and maintain a device or devices suitable for sounding a fire

alarm. Such device or devices may be of any type acceptable to the enforcing agency provided they are distinctive in tone from all other signaling devices or systems and shall be audible throughout the camp premises. When an automatic fire alarm system is provided, as required by Section 440.6.6, all signaling devices required by this section shall be of the same type as that used in the automatic system.

## SECTION 441 RESERVED

## SECTION 442 SCHOOL FACILITIES FOR KINDERGARTEN THROUGH 12TH GRADE AND GROUP E DAY CARE

**442.1 General provisions.** School facilities for Kindergarten through 12th grade and Group E day care shall comply with the provisions of this section and other applicable provisions of this code including requirements for specific occupancies.

**442.1.1 Location on property.** All buildings housing Group E occupancies shall front directly on a public street or an exit discharge not less than 20 feet (6096 mm) in width. The exit discharge to the public street shall be a minimum 20-foot-wide (6096 mm) right-of-way, unobstructed and maintained only as access to the public street. At least one required exit shall be located on the public street or on the exit discharge.

**442.1.2 Separate means of egress systems required.** Every room with an occupant load of 300 or more shall have one of its exits or exit-access doorways lead directly into a separate means of egress system that consists of not less than two paths of exit travel which are separated by a smoke barrier in accordance with Section 709 in such a manner to provide an atmospheric separation that precludes contamination of both paths of exit travel by the same fire. Not more than two required exits or exit-access doorways shall enter into the same means of egress system.

**442.1.3 Fences and gates.** School grounds may be fenced and gates therein may be equipped with locks, provided that safe dispersal areas based on 3 square feet (0.28 m<sup>2</sup>) per occupant are located between the school and the fence. Such required safe dispersal areas shall not be located less than 50 feet (15 240 mm) from school buildings.

Every public and private school shall conform with Section 32020 of the Education Code which states:

The governing board of every public school district, and the governing authority of every private school, which maintains any building used for the instruction or housing of school pupils on land entirely enclosed (except for building walls) by fences or walls, shall, through cooperation with the local law enforcement and fire-protection agencies having jurisdiction of the area, make provision for the erection of gates in such fences or walls. The gates shall be of sufficient size to permit the entrance of the ambulances, police equipment and fire-fighting apparatus

*used by the law enforcement and fire-protection agencies. There shall be no less than one such access gate and there shall be as many such gates as needed to assure access to all major buildings and ground areas. If such gates are to be equipped with locks, the locking devices shall be designed to permit ready entrance by the use of the chain or bolt-cutting devices with which the local law enforcement and fire-protection agencies may be equipped.*

**442.1.4 Special provisions.** Rooms used by kindergarten, first-, or second-grade pupils, and Group E day care, shall not be located above or below the first story.

**Exceptions:**

1. Kindergarten, first-, or second-grade pupils, or day care may be located in basements or stories having floor levels located within 4 feet (1219 mm), measured vertically, from the adjacent ground level at the level of exit discharge, provided the basement or story has exterior exit doors at that level.
2. In buildings equipped with an automatic sprinkler system throughout, rooms used for kindergarten, first- and second-grade children or for day-care purposes may be located on the second story, provided there are at least two exterior exit doors, or other egress systems complying with Section 1018 with two exits, for the exclusive use of such occupants. Egress systems for the exclusive use of such occupants shall be maintained until exit discharge at grade is attained.
3. Group E day-care facilities may be located above the first story in buildings of Type I-A, Type I-B, Type II-A and III-A construction, subject to the limitation of Section 503 when:
  - 3.1. Facilities with children under the age of seven or containing more than 12 children per story shall not be located above the fourth floor; and
  - 3.2. The entire story in which the day-care facility is located is equipped with an approved manual fire alarm and smoke-detection system. Actuation of an initiating device shall sound an audible alarm throughout the entire story.

*When a building fire alarm system is required by other provisions of this code, the alarm system shall be interconnected and sound the day-care fire alarm system; and*
- 3.3. The day-care facility, if more than 1,000 square feet ( $92.9 m^2$ ) in area, is divided into at least two compartments of approximately the same size by a smoke barrier in accordance with Section 709. In addition to the requirements of Section 508, occupancy separations between daycare and other occupancies shall be constructed as smoke barriers. Door openings in the smoke barrier

*shall be tight fitting, with gaskets installed as required by Section 716.5.3.1 and shall be automatic closing by actuation of the fire sprinklers, fire alarm or smoke detection system; and*

- 3.4. Each compartment formed by the smoke barrier has not less than two exits or exit-access doors, one of which is permitted to pass through the adjoining compartment, and
- 3.5. At least one exit or exit-access door from the day-care facility shall be into a separate means of egress with not less than two paths of exit travel, which are separated in such a manner to provide an atmospheric separation.
- 3.6. The building is equipped with an automatic sprinkler system throughout.

**442.1.5 Special hazards.** School classrooms constructed after January 1, 1990, not equipped with automatic sprinkler systems, which have metal grilles or bars on all their windows and do not have at least two exit doors within 3 feet (914 mm) of each end of the classroom opening to the exterior of the building or to a common hallway used for evacuation purposes, shall have an inside release for the grilles or bars on at least one window farthest from the exit doors. The window or windows with the inside release shall be clearly marked as emergency exits.

**442.1.6 Class I, II or III-A flammable liquids** shall not be placed, stored or used in Group E occupancies, except in approved quantities as necessary in laboratories and classrooms and for operation and maintenance as set forth in the California Fire Code.

## SECTION 443 GROUP L [SFM]

**443.1 Scope.** The provisions of this section shall apply to buildings or structures, or portions thereof, containing one or more Group L laboratory suites as defined in Section 443.2.

**443.2 Definitions.** The following terms are defined in Chapter 2:

**LABORATORY SUITE.**

**[F] LIQUID TIGHT FLOOR.**

**443.3 Laboratory suite requirements.**

**443.3.1** The gross square footage of an individual laboratory suite shall not exceed 10,000 sq ft ( $929 m^2$ ).

**443.3.2** An individual laboratory suite shall not serve more than a single tenant.

**Exception:** A laboratory suite controlled by a single responsible party.

**443.4 Construction**

**443.4.1 Separation of laboratory suites.**

**443.4.1.1** Laboratory suites shall be separated from other occupancies in accordance with Table 508.4.

**443.4.1.2** Laboratory suites shall be separated from other laboratory suites by a fire barrier having a fire-resistance rating of not less than 1-hour.

**443.4.1.3** Laboratory suites shall be separated from control areas by a minimum 2-hour fire-resistance rating in accordance with Sections 707 and 711.

**Exception:** Laboratory suites shall be separated from control areas by a minimum 1-hour fire-resistance rating on floor levels below the 4<sup>th</sup> story.

**443.4.1.4 Horizontal separation.** The floor construction of the laboratory suite and the construction supporting the floor of the laboratory suite shall have a minimum 2-hour fire-resistance rating in accordance with Section 711.

**Exceptions:**

1. The floor construction of the laboratory suite and the construction supporting the floor of the laboratory suite are allowed to be 1-hour fire-resistance rated in buildings of Type IIA, IIIA and VA construction.
2. When an individual laboratory suite occupies more than one story, the intermediate floors contained within the suite shall comply with the requirements of Table 601.

**443.4.2 Structural design occupancy category.**

**443.4.2.1** Buildings containing Group L occupancies with an occupant load greater than 500 for colleges or adult education facilities, or other buildings with an occupant load greater than 5,000 shall be classified as Occupancy Category III in accordance with Chapters 16 and 16A.

**443.4.2.2** Other buildings containing Group L occupancies shall be classified as Occupancy Category II in accordance with Chapters 16 and 16A.

**443.4.3 Fire barrier and fire-smoke barrier.**

**443.4.3.1 Fire barrier.** A fire barrier having a fire resistance rating of not less than 2-hours shall divide any story containing more than one laboratory suite above the 4<sup>th</sup> story.

**443.4.3.1.1** Fire barriers shall be continuous from exterior wall to exterior wall,

**443.4.3.1.2** The fire barrier shall divide the floor so that the square footage on each side of the 2-hour fire barrier is not less than 30 percent of the total floor area, and

**443.4.3.1.3** The number of laboratory suites on each side of the 2-hour fire barrier shall not be less than 25 percent of the total number of laboratory suites on the floor.

**443.4.3.2 Fire-smoke barrier.** Any story containing a Group L occupancy above the 10<sup>th</sup> story shall be subdivided by a fire-smoke barrier constructed as a fire barrier having a fire resistance rating of not less than 2-hours and shall also comply with the smoke barrier requirements of Section 709.

The 2-hour fire-smoke barrier shall be in accordance with Sections 443.4.3 through 443.4.3.2.3.

**443.4.3.2.1** A minimum of one door opening shall be provided in the 2-hour fire-smoke barrier for emergency access.

**443.4.3.2.2** Each side of the 2-hour fire-smoke barrier shall be designed as a separate smoke zone designed in accordance with Section 909.6.

**443.4.3.2.3** The area on each side of the 2-hour fire-smoke barrier shall be served by a minimum of one exit enclosure in accordance with Section 1022.

**443.4.4 Emergency response equipment area.** An area for emergency response equipment shall be provided on each floor in an approved location. The area shall be a minimum of 50 square feet (4.6 m<sup>2</sup>), accessed from outside the laboratory suite and identified with signage

**443.4.5 Liquid tight floor.** All portions of the laboratory suite where hazardous materials may be present shall be provided with a liquid tight floor. Where the floor is designed to provide spill control or secondary containment the floor shall be designed in accordance with California Fire Code Section 5004.2.

**443.4.6 Emergency power.** An emergency power system shall be provided in accordance with Chapter 27.

**443.4.6.1 Required systems.** Emergency power shall be provided for all electrically operated equipment, systems and connected control circuits including:

1. Mechanical ventilation systems. See Section 443.4.7.
2. Emergency alarm and monitoring systems.
3. Temperature control systems required to prevent unsafe process excursions or chemical reactions.
4. Treatment systems and scrubbers.
5. Egress lighting.
6. Electrically operated systems required elsewhere in this code and the California Fire Code.

**443.4.7 Ventilation.**

**443.4.7.1 Compatibility.** Incompatible materials shall not be conveyed in the same duct system. Combined products in mechanical exhaust ducts shall not create a physical hazard or reaction that could degrade the duct material. The building official may require a technical report in accordance with Section 443.7.1.

**443.4.7.2 Fire dampers, smoke dampers and combination fire/smoke dampers.** Fire dampers, smoke dampers or fire/smoke dampers shall not be permitted in product conveying and other mechanical exhaust duct systems used to maintain a safe laboratory environment. When the exhaust duct penetrates the laboratory suite boundary the exhaust duct shall be located within a horizontal assembly having a fire resistance rating equal to the fire barrier.

**443.4.7.3 Duct materials.** Product conveying and other mechanical exhaust duct systems used to maintain a

*safe laboratory environment shall be constructed in accordance with Chapters 5 and 6 of the California Mechanical Code.*

**443.4.7.4 Laboratory suite exhaust air.**

**443.4.7.4.1** *Exhaust air from laboratory suites shall not be recirculated.*

**443.4.7.4.2** *Laboratory suite exhaust air shall be independently ducted to a point outside the building or a roof top structure.*

**Exceptions:**

1. *Exhaust ducts serving a single laboratory suite.*
2. *Exhaust ducts serving separate laboratory suites on the same story may be connected to a common duct within a fire rated vertical shaft when the sub-duct extends vertically upward at least 22 inches.*
3. *Exhaust ducts serving separate laboratory suites on the basement through the 4<sup>th</sup> story may be connected to a common duct within a fire rated vertical shaft when the sub-duct extends vertically upward at least 22 inches.*
4. *Exhaust ducts serving separate laboratory suites on the 5<sup>th</sup> story and above may be connected to a common duct that does not exceed 100 vertical feet within a fire rated vertical shaft when the subducts extends vertically upward at least 22 inches. Ducts serving the 5<sup>th</sup> story and above shall be separate from the duct serving the 4<sup>th</sup> story and below, but may be within the same fire rated shaft*

**443.4.7.4.3** *Laboratory suite exhaust ducts shall not penetrate the 2-hour fire barrier required by Section 443.4.3.*

**Exception:** *Where the exhaust duct is enclosed in a 2-hour shaft in accordance with Section 708.*

**443.4.7.5 Ventilation rates.** *Mechanical exhaust ventilation systems shall provide a minimum ventilation rate not less than 1 cubic foot per minute per square foot [0.00508 m<sup>3</sup>/(s·m<sup>2</sup>)] of floor area, or 6 air exchanges per hour, whichever is greater. Systems shall operate continuously at the designed ventilation rate*

**443.4.7.6 Mechanical ventilation systems on emergency power.** *When operating on emergency power, the ventilation rate may be reduced to a level sufficient to maintain a differential pressure negative to the surrounding area.*

**443.4.7.7 Mechanical ventilation system balancing.** *Mechanical ventilation systems shall be designed and balanced such that during normal and emergency conditions the door opening forces comply with the requirements of Sections 1008.1.3 and Chapter 11B as*

*applicable. Emergency conditions shall include: supply fan shutdown or failure, closing of smoke dampers or combination fire/smoke dampers, or emergency power.*

**443.5 Fire protection systems. See Chapter 9.**

**443.6 Means of egress.**

**443.6.1 Access to exits.** *Every portion of a laboratory suite containing hazardous materials and having a floor area of 500 square feet (19 m<sup>2</sup>) or more shall have access to not less than two separate exits or exit-access doorways in accordance with Section 1015.2.*

**443.6.2 Door swing.** *All exit and exit-access doors serving areas with hazardous materials shall swing in the direction of exit travel, regardless of the occupant load served.*

**443.6.3 Panic hardware.** *Exit and exit access doors from areas with hazardous materials shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.*

**443.6.4 Buildings more than four stories.** *A minimum of one exit shall be provided to serve the floor on each side of the 2-hour fire barrier and shall comply with the provisions of Chapter 10.*

**443.6.5 Corridors.** *Corridors shall comply with Section 1018 and shall have opening protection in accordance with Tables 716.5 and 716.6.*

**443.7 Hazardous materials.**

**443.7.1 Technical report.** *The enforcing agency may require a technical opinion and report to identify and develop methods of protection from the hazards presented by the hazardous materials. A qualified person, firm or corporation, approved by the enforcing agency, shall prepare the opinion and report, and shall be provided without charge to the enforcing agency. The opinion and report may include, but is not limited to, the preparation of a hazardous material management plan (HMMP); chemical analysis; recommendations for methods of isolation, separation, containment or protection of hazardous materials or processes, including appropriate engineering controls to be applied; the extent of changes in the hazardous behavior to be anticipated under conditions of exposure to fire or from hazard control procedures; and the limitations or conditions of use necessary to achieve and maintain control of the hazardous materials or operations. The report shall be entered into the files of the code enforcement agencies. Proprietary and trade secret information shall be protected under the laws of the state or jurisdiction having authority.*

**443.7.2 Multiple hazards.** *When a hazardous material has multiple hazards, all hazards shall be addressed and controlled in accordance with the provisions of this code.*

**443.7.3 Percentage of maximum allowable quantities.** *The percentage of the maximum allowable quantity of hazardous materials per laboratory suite permitted for each story level within a building shall be in accordance with Table 443.7.3.1.*

**TABLE 443.7.3.1**  
**HAZARDOUS MATERIALS QUANTITY PER LABORATORY SUITE**

STORY	PERCENTAGE OF MAXIMUM ALLOWABLE QUANTITY PER LABORATORY SUITE <sup>a, b</sup>	NUMBER OF LAB SUITES PER FLOOR BASED ON CONSTRUCTION TYPE				
		Type IA	Type IB	Type IIA, IIIA, IV	Type IIB, IIIB, VA	Type VB
Above grade plane	Above 20	0	NP	NP	NP	NP
	15 to 20	25	4	NP	NP	NP
	11, 12, 13, 14	50	8	NP	NP	NP
	7, 8, 9, 10	50	16	NP	NP	NP
	6	75	20	20	NP	NP
	4, 5	75	20	20	20	NP
	3	100	UL	UL	UL	NP
Below grade plane	1, 2	100	UL	UL	UL	UL
	1	75 <sup>c</sup>	10	10	10	10
	2	50 <sup>d</sup>	5	5	5	5
3 and below	0	NP	NP	NP	NP	NP

UL = Unlimited, NP = Not permitted

- a. Percentages shall be of the maximum allowable quantity per laboratory suite shown in Tables 307.1(1) and 307.1(2). Allowable hazardous material increases for buildings equipped throughout with an automatic sprinkler system shall not be applicable to Group L occupancies.
- b. When an individual laboratory suite occupies more than one story, the more restrictive percentage of the maximum allowable quantity per laboratory suite shall apply.
- c. The total aggregate quantity of flammable liquids on the first story below grade shall be limited to the maximum total aggregate quantity for Group B occupancy control areas.
- d. The total aggregate quantity of flammable liquids on the second story level below grade shall be limited to a maximum total aggregate quantity for Group B occupancy control areas.

**443.7.4 Handling and transportation.** The handling and transportation of hazardous materials shall be in accordance with Section 5003 of the California Fire Code.

**443.7.5 Transportation of hazardous materials above the 10<sup>th</sup> story.** Transportation of hazardous materials above the 10<sup>th</sup> story shall be limited to 5 percent of the maximum allowable quantities of Tables 307.1 (1) and 307.1(2). Quantities are permitted to be increased 100 percent in buildings with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Materials where footnote g of Table 307.1(1) applies shall not be increased.

**443.8. Elevators and elevator lobbies above the 10<sup>th</sup> story.** Any story containing a Group L occupancy above the 10<sup>th</sup> story shall be provided with elevators and elevator lobbies in accordance with Sections 443.8.1 through 443.8.3.

**443.8.1** An elevator that serves every story of the building shall be provided on each side of the 2-hour fire-smoke barrier.

**443.8.2** An elevator lobby shall be provided on each side of the 2-hour fire-smoke barrier at each floor in accordance with Section 413.14.1. Exceptions to 413.14.1 shall not apply.

**443.8.3** The elevator and its associated elevator lobbies and elevator machine rooms shall be pressurized in accordance with Section 909.6.

**443.9** Existing Group L (Formerly Group H-8) occupancies, additions, alterations, or repairs. See Section 3416.

## SECTION 444 Reserved

## SECTION 445 LARGE FAMILY DAY-CARE HOMES [SFM]

**445.1 Large family day-care homes.**

**445.2** For purposes of clarification, Health and Safety Code Section 1597.46 is repeated.

(a) A city, county, or city and county shall not prohibit large family day care homes on lots zoned for single-family dwellings, but shall do one of the following:

(1) Classify these homes as a permitted use of residential property for zoning purposes.

(2) Grant a nondiscretionary permit to use a lot zoned for a single-family dwelling to any large family day-care home that complies with local ordinances prescribing reasonable standards, restrictions and requirements concerning spacing and concentration, traffic control, parking and noise control relating to such homes, and complies with subdivision (d) and any regulations adopted by the state fire marshal pursuant to that subdivision. Any noise standards shall be consistent with local noise ordinances implementing the noise element of the general plan and shall take into consideration the noise level generated by children. The permit issued pursuant to this paragraph shall be granted by the zoning administrator, if any, or if there is no zoning administrator by the person or persons designated by the planning agency to grant such permits, upon the certification without a hearing.

(3) Require any large family day-care home to apply for a permit to use a lot zoned for single-family dwellings. The zoning administrator, if any, or if there is no zoning administrator, the person or persons designated by the planning agency to handle the use permits shall review and decide the applications. The use permit shall be granted if the large family day care home complies with local ordinances, if any, prescribing reasonable standards, restrictions and requirements concerning spacing and concentration, traffic control, parking and noise control relating to such homes, and complies with subdivision (d) and any regulations adopted by the state fire marshal pursuant to that subdivision.

Any noise standards shall be consistent with local noise ordinances implementing the noise element of the general plan and shall take into consideration the noise levels generated by children.

*The local government shall process any required permit as economically as possible, and fees charged for review shall not exceed the costs of the review and permit process. Not less than 10 days prior to the date on which the decision will be made on the application, the zoning administrator or person designated to handle such use permits shall give notice of the proposed use by mail or delivery to all owners shown on the last equalized assessment roll as owning real property within a 100-foot radius of the exterior boundaries of the proposed large family day care home. No hearing on the application for a permit issued pursuant to this paragraph shall be held before a decision is made unless a hearing is requested by the applicant or other affected person. The applicant or other affected person may appeal the decision. The appellant shall pay the cost, if any of the appeal.*

(b) A large family day-care home shall not be subject to the provisions of Division 13 (commencing with Section 21000) of the Public Resources Code.

(c) Use of a single-family dwelling for the purposes of a large family day-care home shall not constitute a change of occupancy for purposes of Part 1.5 (commencing with Section 17910) of Division 13 (State Housing Law), or for purposes of local building and fire codes.

(d) Large family day-care homes shall be considered as single-family residences for the purposes of the State Uniform Building Standards Code and local building and fire codes, except with respect to any additional standards specifically designed to promote the fire and life safety of the children in these homes adopted by the State Fire Marshal pursuant to this subdivision.

**445.3 Smoke alarms.** Large family day-care homes shall be equipped with State Fire Marshal approved and listed single station residential type smoke alarms. The number and placement of smoke alarms shall be determined by the enforcement authority.

**445.4 Fire extinguishers.** Large and small family day-care homes shall be equipped with a portable fire extinguisher having a minimum 2A10BC rating.

**445.5 Fire alarm devices.** See Section 907.2.6.4.

**445.6 Compliance.** Every large-family day-care home shall comply with the provisions for Group R-3 occupancies and, if appropriate, Section 426.1. For the purposes of Section 426.1, the first story shall be designated as the floor used for residential occupancy nearest to the street level which provides primary access to the building.

Enforcement of the provisions shall be in accordance with the Health and Safety Code Sections 13145 and 13146. No city, county, city and county, or district shall adopt or enforce any building ordinance or local rule or regulation relating to the subject of fire and life safety in large-family day-care homes which is inconsistent with those standards adopted by the State Fire Marshal, except to the extent the building ordinance or local rule or regulation applies to single-family residences in which day care is not provided.

**445.7 Special hazards.** Every unenclosed gas-fired water heater or furnace which is within the area used for child care in a large family day-care home shall be protected in such a way as to prevent children from making contact with those appliances.

*Exception:* This does not apply to kitchen stoves or ovens.

**445.8 Exiting.** See Section 1015.7.

## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 5 – GENERAL BUILDING HEIGHTS AND AREAS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting Agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)		X	X	X																
Adopt only those sections that are listed below						X								X			X			
<i>Chapter / Section</i>																				
Table 503		X																		
503.1			X																	
504.2																				
506.3		X																		
506.4.1		X																		
506.5.2		X																		
507.3		X																		
507.10		X																		
508.2.4		X																		
508.3.3		X																		
Table 508.4		X																		
Table 509		X																		
509.2		X																		
510.10		X																		



# CHAPTER 5

## GENERAL BUILDING HEIGHTS AND AREAS

### SECTION 501 GENERAL

**501.1 Scope.** The provisions of this chapter control the height and area of structures hereafter erected and additions to existing structures.

**[F] 501.2 Address identification.** New and existing buildings shall be provided with approved address numbers or letters. Each character shall be not less than 4 inches (102 mm) in height and not less than 0.5 inch (12.7 mm) in width. They shall be installed on a contrasting background and be plainly visible from the street or road fronting the property. When required by the fire code official, address numbers shall be provided in additional approved locations to facilitate emergency response. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other approved sign or means shall be used to identify the structure. Address numbers shall be maintained.

### SECTION 502 DEFINITIONS

**502.1 Definitions.** The following terms are defined in Chapter 2:

**AREA, BUILDING.**

**BASEMENT.**

**EQUIPMENT PLATFORM.**

**GRADE PLANE.**

**HEIGHT, BUILDING.**

**MEZZANINE.**

### SECTION 503 GENERAL BUILDING HEIGHT AND AREA LIMITATIONS

**503.1 General.** The building height and area shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more fire walls complying with Section 706 shall be considered to be a separate building.

**Exceptions:**

1. **[HCD 1]** Limited-density owner-built rural dwellings may be of any type of construction which will provide for a sound structural condition. Structural hazards which result in an unsound condition and which may constitute a substandard building are delineated by Section 17920.3 of the Health and Safety Code.

2. Other than structural requirements, solar photovoltaic panels supported by a structure with no use underneath shall not constitute additional story or additional floor area and may exceed the height limit when constructed on a roof top of a building provided the following conditions are met:

1.1. For all occupancies, the highest point of the structure/panel shall meet the lower of the two values below:

1. 3' above the allowable building height per this code.
2. 3' above the roof of the building immediately below.

2.1. For installations on flat roofs in other than Group R-3 and R-4 occupancies, the highest point of the structure/panel shall meet the lower of the two values below:

1. 10' above the allowable building height per this code.
2. 10' above the roof of the building immediately below.

3. Other than structural requirements, solar photovoltaic panels supported by a structure over parking stalls shall not constitute additional story or additional floor area and may exceed the height limit as specified in exception 2 (above) when the following conditions are met (see Figure 5-1):

1. The area within the perimeter of the photovoltaic array has maximum rectangular dimension of 40 feet by 150 feet.
2. The distance between solar photovoltaic array structures is a minimum of 10 feet clear.
3. The driveway aisle separating solar photovoltaic array structures has a minimum width of 25 feet clear.
4. Solar photovoltaic array structure is used only for parking purposes with no storage.
5. Completely open on all sides (other than necessary structural supports) with no interior partitions.

**503.1.1 Special industrial occupancies.** Buildings and structures designed to house special industrial processes that require large areas and unusual building heights to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be

## GENERAL BUILDING HEIGHTS AND AREAS

exempt from the building height and area limitations of Table 503.

**503.1.2 Buildings on same lot.** Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the building height of each building and the aggregate building area of the buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

**503.1.3 Type I construction.** Buildings of Type I construction permitted to be of unlimited tabular building heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited building height in Sections 503.1.1 and 504.3 or increased building heights and areas for other types of construction.

**TABLE 503**  
**ALLOWABLE BUILDING HEIGHTS AND AREAS<sup>a, b</sup>**

**Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.  
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story**

GROUP		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V
		A	B	A	B	A	B	HT	A	B
HEIGHT (feet)		UL	160	65	55	65	55	65	50	40
<b>STORIES(S) AREA (A)</b>										
A-1	S A	UL UL	5 UL	3 15,500	2 8,500	3 14,000	2 8,500	3 15,000	2 11,500	1 5,500
A-2	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-3	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-4	S A	UL UL	11 UL	3 15,500	2 9,500	3 14,000	2 9,500	3 15,000	2 11,500	1 6,000
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	3 23,000	5 28,500	3 19,000	5 36,000	3 18,000	2 9,000
E	S A	UL UL	5 UL	3 26,500	2 14,500	3 23,500	2 14,500	3 25,500	1 18,500	1 9,500
F-1	S A	UL UL	11 UL	4 25,000	2 15,500	3 19,000	2 12,000	4 33,500	2 14,000	1 8,500
F-2	S A	UL UL	11 UL	5 37,500	3 23,000	4 28,500	3 18,000	5 50,500	3 21,000	2 13,000
H-1	S A	1 21,000	1 16,500	1 11,000	1 7,000	1 9,500	1 7,000	1 10,500	1 7,500	NP NP
H-2	S A	20 21,000	3 16,500	2 11,000	1 7,000	2 9,500	1 7,000	2 10,500	1 7,500	1 3,000
H-3	S A	20 UL	6 60,000	4 26,500	2 14,000	4 17,500	2 13,000	4 25,500	2 10,000	1 5,000
H-4	S A	20 UL	7 UL	5 37,500	3 17,500	5 28,500	3 17,500	5 36,000	3 18,000	2 6,500
H-5	S A	4 UL	4 UL	3 37,500	3 23,000	3 28,500	3 19,000	3 36,000	3 18,000	2 9,000
I-2/I-2.1 <sup>d</sup>	S A	UL UL	4 UL	2 15,000	1 11,000	1 12,000	NP NP	1 12,000	1 9,500	NP NP
I-3 <sup>e</sup>	S A	UL UL	2 15,100	NP NP						
I-4	S A	UL UL	5 60,500	3 26,500	2 13,000	3 23,500	2 13,000	3 25,500	1 18,500	1 9,000
L	S A	20 UL	6 60,000	5 37,500	3 17,500	5 28,500	3 17,500	5 36,000	3 18,000	2 6,500
M	S A	UL UL	11 UL	4 21,500	2 12,500	4 18,500	2 12,500	4 20,500	3 14,000	1 9,000
R-1	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000

(continued)

**TABLE 503—continued**  
**ALLOWABLE BUILDING HEIGHTS AND AREAS<sup>a, b</sup>**

GROUP		TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V	
		A	B	A	B	A	B	HT	A	B	
		HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
STORIES(S) AREA (A)											
R-2	S A	UL UL	11 UL	4 24,000	4 16,000	4 24,000	4 16,000	4 20,500	3 12,000	2 7,000	
R-2.1	S A	UL UL	6 <sup>f</sup> 55,000	3 <sup>e</sup> 19,000	NP NP	3 <sup>e</sup> 16,500	NP NP	NP NP	3 <sup>e</sup> 10,500	NP NP	
R-3/R-3.1	S A	UL UL	11	4 UL	4 UL	4 UL	4 UL	4 UL	3 UL	3 UL	
R-4	S A	UL UL	11 <sup>f</sup> UL	4 <sup>e</sup> 24,000	4 <sup>g</sup> 16,000	4 <sup>e</sup> 24,000	4 <sup>g</sup> 16,000	4 <sup>g</sup> 20,500	3 <sup>e</sup> 12,000	2 <sup>g</sup> 7,000	
S-1	S A	UL UL	11	4 48,000	2 26,000	3 17,500	2 26,000	2 17,500	4 25,500	3 14,000	1 9,000
S-2	S A	UL UL	11	5 39,000	3 26,000	4 39,000	3 26,000	5 38,500	4 21,000	2 13,500	
U	S A	UL UL	5	4 35,500	2 19,000	3 8,500	3 14,000	2 8,500	4 18,000	2 9,000	1 5,500

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:

1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
2. Section 506.2, Allowable building area increase due to street frontage.
3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
4. Section 507, Unlimited area buildings.

b. See Chapter 4 for specific exceptions to the allowable height and areas in Chapter 5.

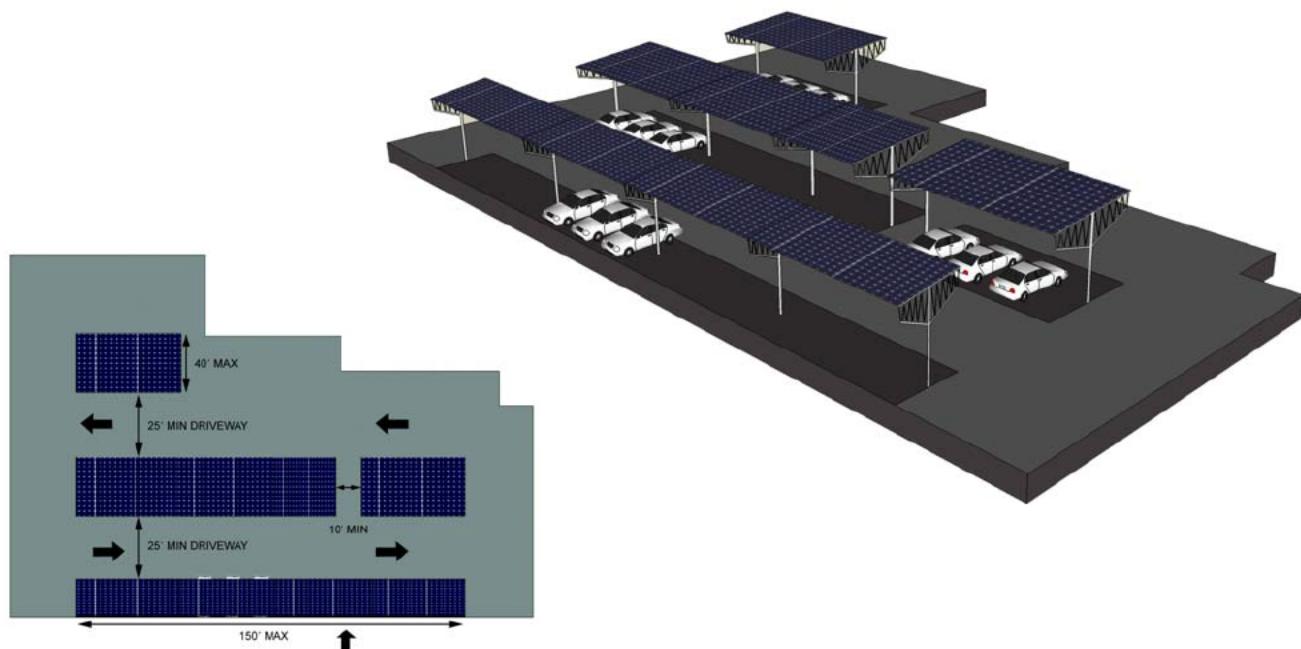
c. See Section 408.1.2 for specific exceptions to construction type, allowable building areas and allowable heights.

d. Restraint shall not be permitted in any building except in Group I-3 occupancies constructed for such use (see Section 408.1.2).

e. Nonambulatory persons shall be limited to the first 2 stories.

f. Nonambulatory persons shall be limited to the first 5 stories.

g. Nonambulatory elderly clients are not permitted in buildings of these types of construction. See Section 425.3.3 and 425.3.4.



**FIGURE 5-1**

## SECTION 504 BUILDING HEIGHT

**504.1 General.** The building height permitted by Table 503 shall be increased in accordance with Sections 504.2 and 504.3.

**Exception:** The building height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic sprinkler system or automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times the building height.

**504.2 Automatic sprinkler system increase.** Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. Increases are permitted in addition to the building area increase in accordance with Section 506.2. *In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, these increases are permitted in addition to the area increase in accordance with Section 506.3.* For Group R-2 buildings of Type VA construction equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively, *these increases are permitted in addition to the area increase in accordance with Section 506.3.* For Group R-3 buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

**Exception:** The use of an automatic sprinkler system to increase building heights shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Buildings where an automatic sprinkler system is substituted for fire-resistance rated construction in accordance with Table 601, Note d.
4. [SFM] Buildings, or portions of buildings, classified as a Group L occupancy.
5. [SFM] Buildings, or portions of buildings, classified as a Licensed Group R-2.1 or R-4 occupancy.

**504.3 Roof structures.** Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible

materials and shall not extend more than 20 feet (6096 mm) above the allowable building height if of combustible materials (see Chapter 15 for additional requirements).

## SECTION 505 MEZZANINES AND EQUIPMENT PLATFORMS

**505.1 General.** Mezzanines shall comply with Section 505.2. Equipment platforms shall comply with Section 505.3.

**505.2 Mezzanines.** A mezzanine or mezzanines in compliance with Section 505.2 shall be considered a portion of the story below. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area. The clear height above and below the mezzanine floor construction shall be not less than 7 feet (2134 mm).

**505.2.1 Area limitation.** The aggregate area of a mezzanine or mezzanines within a room shall be not greater than one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.

Where a room contains both a mezzanine and an equipment platform, the aggregate area of the two raised floor levels shall be not greater than two-thirds of the floor area of that room or space in which they are located.

### Exceptions:

1. The aggregate area of mezzanines in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 503.1.1 shall be not greater than two-thirds of the floor area of the room.
2. The aggregate area of mezzanines in buildings and structures of Type I or II construction shall be not greater than one-half of the floor area of the room in buildings and structures equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and an approved emergency voice/alarm communication system in accordance with Section 907.5.2.2.

**505.2.2 Means of egress.** The means of egress for mezzanines shall comply with the applicable provisions of Chapter 10.

**505.2.3 Openness.** A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) in height, columns and posts.

### Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space is not greater than 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the

means of egress provides direct access to an exit from the mezzanine level.

3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In occupancies other than Groups H and I, that are no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

**505.3 Equipment platforms.** Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area in accordance with Section 903. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs, alternating tread devices and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

**505.3.1 Area limitation.** The aggregate area of all equipment platforms within a room shall be not greater than two-thirds of the area of the room in which they are located. Where an equipment platform is located in the same room as a mezzanine, the area of the mezzanine shall be determined by Section 505.2.1 and the combined aggregate area of the equipment platforms and mezzanines shall be not greater than two-thirds of the room in which they are located.

**505.3.2 Automatic sprinkler system.** Where located in a building that is required to be protected by an automatic sprinkler system, equipment platforms shall be fully protected by sprinklers above and below the platform, where required by the standards referenced in Section 903.3.

**505.3.3 Guards.** Equipment platforms shall have guards where required by Section 1013.2.

## SECTION 506 BUILDING AREA MODIFICATIONS

**506.1 General.** The building areas limited by Table 503 shall be permitted to be increased due to frontage ( $I_f$ ) and automatic sprinkler system protection ( $I_s$ ) in accordance with Equation 5-1:

$$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\} \quad (\text{Equation 5-1})$$

where:

$A_a$  = Allowable building area per story (square feet).

$A_t$  = Tabular building area per story in accordance with Table 503 (square feet).

$I_f$  = Area increase factor due to frontage as calculated in accordance with Section 506.2.

$I_s$  = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

**506.2 Frontage increase.** Every building shall adjoin or have access to a public way to receive a building area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a width of not less than 20 feet (6096 mm), the frontage increase shall be determined in accordance with Equation 5-2:

$$I_f = [F/P - 0.25]W/30 \quad (\text{Equation 5-2})$$

where:

$I_f$  = Area increase due to frontage.

$F$  = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).

$P$  = Perimeter of entire building (feet).

$W$  = Width of public way or open space (feet) in accordance with Section 506.2.1.

**506.2.1 Width limits.** To apply this section the value of  $W$  shall be not less than 20 feet (6096 mm). Where the value of  $W$  varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average calculated in accordance with Equation 5-3 for portions of the exterior perimeter walls where the value of  $W$  is greater than or equal to 20 feet (6096 mm). Where the value of  $W$  is greater than 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space.  $W$  shall be measured perpendicular from the face of the building to the closest interior lot line. Where the building fronts on a public way, the entire width of the public way shall be used. Where two or more buildings are on the same lot,  $W$  shall be measured from the exterior face of each building to the opposing exterior face of each adjacent building, as applicable.

$$\text{Weighted average } W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \dots) / F. \quad (\text{Equation 5-3})$$

where:

$L_n$  = Length of a portion of the exterior perimeter wall.

$w_n$  = Width of open space associated with that portion of the exterior perimeter wall.

$F$  = Building perimeter that fronts on a public way or open space having a width of 20 feet (6096 mm) or more.

**Exception:** Where the building meets the requirements of Section 507, as applicable, except for compliance with the 60-foot (18 288 mm) public way or yard requirement, and the value of  $W$  is greater than 30 feet (9144 mm), the value of  $W$  divided by 30 shall be limited to a maximum of 2.

**506.2.2 Open space limits.** Such open space shall be either on the same lot or dedicated for public use and shall be accessed from a street or approved fire lane.

**506.3 Automatic sprinkler system increase.** Where a building is equipped throughout with *an approved automatic sprinkler system in accordance with Section 903.3.1.1, the building area limitation in Table 503 is permitted to be increased by an additional 200 percent ( $I_s = 2$ ) for buildings with more than one story above grade plane and an additional 300 percent ( $I_s = 3$ ) for buildings with no more than one story above grade plane. In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, these increases are permitted in addition to the height and story increases in accordance with Section 504.2. For Group R-2 buildings of Type VA construction equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, these increases are permitted in addition to the height and story increase in accordance with Section 504.2.*

**Exception:** The use of an automatic sprinkler system to increase the building area limitation shall not be permitted for the following conditions:

1. Buildings classified as a Group H-1 occupancy.
2. Buildings, or portions of buildings, classified as either a Group H-2 or H-3 occupancy. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Buildings where an automatic sprinkler system is substituted for fire-resistance rated construction in accordance with Table 601, Note d.
4. [SFM] *The automatic sprinkler system increase shall not apply to buildings with an occupancy in Group L.*

**506.4 Single occupancy buildings with more than one story.** The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined in accordance with this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

**Exception:** A single basement need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

**506.4.1 Area determination.** *In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, the total allowable building area of a single occupancy building with more than one story above grade plane shall be determined by multiplying the allowable building area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane as listed below:*

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable building area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exception:** Unlimited area buildings in accordance with Section 507.

*For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, the total allowable building area of a single occupancy building with more than one story above grade plane shall be determined by multiplying the allowable building area per story ( $A_a$ ), as determined in Section 506.1, by the number of stories above grade plane as listed below:*

1. For buildings with two or more stories above grade plane, multiply by 2;
2. No story shall exceed the allowable building area per story ( $A_a$ ), as determined in Section 506.1, for the occupancies on that story.

**Exception:** Unlimited area buildings in accordance with Section 507.

**506.5 Mixed occupancy area determination.** The total allowable building area for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single basement need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

**506.5.1 No more than one story above grade plane.** For buildings with no more than one story above grade plane and containing mixed occupancies, the total building area shall be determined in accordance with the applicable provisions of Section 508.1.

**506.5.2 More than one story above grade plane.** For buildings with more than one story above grade plane and containing mixed occupancies, each story shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 3.

*For other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 3.*

*For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11*

*regulated by the Office of the State Fire Marshal, buildings with more than two stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 2.*

## SECTION 507 UNLIMITED AREA BUILDINGS

**507.1 General.** The area of buildings of the occupancies and configurations specified in Sections 507.1 through 507.12 shall not be limited.

**Exception:** Other occupancies shall be permitted in unlimited area buildings in accordance with the provisions of Section 508.2.

Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by public ways and yards, those open spaces shall be determined as follows:

1. Yards shall be measured from the building perimeter in all directions to the closest interior lot lines or to the exterior face of an opposing building located on the same lot, as applicable.
- 2 Where the building fronts on a public way, the entire width of the public way shall be used.

**507.2 Nonsprinklered, one story.** The area of a Group F-2 or S-2 building no more than one story in height shall not be limited where the building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.3 Sprinklered, one story.** The area of a Group B, F, M or S building no more than one story above grade plane of any construction type, shall not be limited where the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**Exception:** Buildings and structures of Types I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.3 and 903.3.1.1 and Chapter 32 of the *California Fire Code*.

**507.3.1 Mixed occupancy buildings with Groups A-1 and A-2.** Group A-1 and A-2 occupancies of other than Type V construction shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.3, provided:

1. Group A-1 and A-2 occupancies are separated from other occupancies as required for separated occupancies in Section 508.4.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
2. Each area of the portions of the building used for Group A-1 or A-2 occupancies shall not exceed the

maximum allowable area permitted for such occupancies in Section 503.1; and

3. Exit doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.

**507.4 Two story.** The area of a Group B, F, M or S building no more than two stories above grade plane shall not be limited where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.5 Reduced open space.** The public ways or yards of 60 feet (18 288 mm) in width required in Sections 507.2, 507.3, 507.4, 507.6 and 507.11 shall be permitted to be reduced to not less than 40 feet (12 192 mm) in width provided all of the following requirements are met:

1. The reduced width shall not be allowed for more than 75 percent of the perimeter of the building.
2. The exterior walls facing the reduced width shall have a fire-resistance rating of not less than 3 hours.
3. Openings in the exterior walls facing the reduced width shall have opening protectives with a fire protection rating of not less than 3 hours.

**507.6 Group A-3 buildings of Type II construction.** The area of a Group A-3 building no more than one story above grade plane, used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction, shall not be limited provided all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.7 Group A-3 buildings of Types III and IV construction.** The area of a Group A-3 building of Type III or IV construction, with no more than one story above grade plane, and used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court, shall not be limited provided all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.

4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.8 Group H occupancies.** Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies in accordance with Sections 507.3 and 507.4 and the provisions of Sections 507.8.1 through 507.8.4.

**507.8.1 Allowable area.** The aggregate floor area of Group H occupancies located in an unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2 based upon the perimeter of each Group H floor area that fronts on a public way or open space.

**507.8.1.1 Located within the building.** The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the Group H occupancies as specified in Table 503.

**507.8.1.1.1 Liquid use, dispensing and mixing rooms.** Liquid use, dispensing and mixing rooms having a floor area of not more than 500 square feet ( $46.5 \text{ m}^2$ ) need not be located on the outer perimeter of the building where they are in accordance with the *California Fire Code* and NFPA 30.

**507.8.1.1.2 Liquid storage rooms.** Liquid storage rooms having a floor area of not more than 1,000 square feet ( $93 \text{ m}^2$ ) need not be located on the outer perimeter where they are in accordance with the *California Fire Code* and NFPA 30.

**507.8.1.1.3 Spray paint booths.** Spray paint booths that comply with the *California Fire Code* need not be located on the outer perimeter.

**507.8.2 Located on building perimeter.** Except as provided for in Section 507.8.1.1, Group H occupancies shall be located on the perimeter of the building. In Group H-2 and H-3 occupancies, not less than 25 percent of the perimeter of such occupancies shall be an exterior wall.

**507.8.3 Occupancy separations.** Group H occupancies shall be separated from the remainder of the unlimited area building and from each other in accordance with Table 508.4.

**507.8.4 Height limitations.** For two-story unlimited area buildings, Group H occupancies shall not be located more than one story above grade plane unless permitted based on the allowable height in stories and feet as set forth in Table 503 for the type of construction of the unlimited area building.

**507.9 Aircraft paint hangar.** The area of a Group H-2 aircraft paint hangar no more than one story above grade plane shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.6 and is surrounded and adjoined by public ways or yards not less in width than one and one-half times the building height.

**507.10 Group E buildings.** The area of a Group E building no more than one story above grade plane, of Type II, IIIA or IV construction, shall not be limited provided all of the following criteria are met:

1. Each classroom shall have not less than two means of egress, with one of the means of egress being a direct exit to the outside of the building complying with Section 1020.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.11 Motion picture theaters.** In buildings of Type II construction, the area of a motion picture theater located on the first story above grade plane shall not be limited provided the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

**507.12 Covered and open mall buildings and anchor buildings.** The area of covered and open mall buildings and anchor buildings not exceeding three stories in height that comply with Section 402 shall not be limited.

## SECTION 508 MIXED USE AND OCCUPANCY

**508.1 General.** Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

### Exceptions:

1. Occupancies separated in accordance with Section 510.
2. Where required by Table 415.5.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a detached building or structure.
3. Uses within live/work units, complying with Section 419, are not considered separate occupancies.

**508.2 Accessory occupancies.** Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4.

**508.2.1 Area limitations.** Aggregate accessory occupancies shall not occupy more than 10 percent of the building area of the story in which they are located and shall not exceed the tabular values in Table 503, without building area increases in accordance with Section 506 for such accessory occupancies.

**508.2.2 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to

each portion of the building based on the occupancy classification of that space.

**508.2.3 Allowable building area and height.** The allowable building area and height of the building shall be based on the allowable building area and height for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The building area of the accessory occupancies shall be in accordance with Section 508.2.1.

**508.2.4 Separation of occupancies.** No separation is required between accessory occupancies and the main occupancy.

**Exceptions:**

1. Group H-2, H-3, H-4, H-5, I-2, I-2.1, I-3 and L occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2, R-2.1 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

**508.3 Nonseparated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

**508.3.1 Occupancy Classification.** Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space. In addition, the most restrictive provisions of Chapter 9 which apply to the nonseparated occupancies shall apply to the total nonseparated occupancy area. Where nonseparated occupancies occur in a high-rise building, the most restrictive requirements of Section 403 which apply to the nonseparated occupancies shall apply throughout the high-rise building.

**508.3.2 Allowable building area and height.** The allowable building area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

**508.3.3 Separation.** No separation is required between nonseparated occupancies.

**Exceptions:**

1. Group H-2, H-3, H-4, H-5, I-2, I-2.1, I-3 and L occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group R-1, R-2, R-2.1 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from other occupan-

cies contiguous to them in accordance with the requirements of Section 420.

**508.4 Separated occupancies.** Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.

**508.4.1 Occupancy classification.** Separated occupancies shall be individually classified in accordance with Section 302.1. Each separated space shall comply with this code based on the occupancy classification of that portion of the building.

**508.4.2 Allowable building area.** In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed 1.

**508.4.3 Allowable height.** Each separated occupancy shall comply with the building height limitations based on the type of construction of the building in accordance with Section 503.1.

**Exception:** Special provisions permitted by Section 510 shall permit occupancies at building heights other than provided in Section 503.1.

**508.4.4 Separation.** Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

**508.4.4.1 Construction.** Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies.

## SECTION 509 INCIDENTAL USES

**509.1 General.** Incidental uses located within single occupancy or mixed occupancy buildings shall comply with the provisions of this section. Incidental uses are ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy and are limited to those uses listed in Table 509.

**Exception:** Incidental uses within and serving a dwelling unit are not required to comply with this section.

**509.2 Occupancy classification.** Incidental uses shall not be individually classified in accordance with Section 302.1. Incidental uses shall be included in the building occupancies within which they are located.

**509.3 Area limitations.** Incidental uses shall not occupy more than 10 percent of the building area of the story in which they are located.

**509.4 Separation and protection.** The incidental uses listed in Table 509 shall be separated from the remainder of the building or equipped with an automatic sprinkler system, or both, in accordance with the provisions of that table.

**TABLE 508.4**  
**REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

OCCUPANCY	A, E		I-4, R-2.1		I-2, I-2.1		I-3		R-1, R-2, R-3, R-3.1, R-4		F-2, S-2 <sup>b</sup> , U		B, F-1 <sup>c</sup> , M, S-1		L		H-1		H-2		H-3, H-4				
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS			
A, E	N	N	2	2	2	NP	2	NP	1	2	N	1	1	2	2	NP	NP	NP	3	4	2	3 <sup>a</sup>	2	NP	
I-4, R-2.1	—	—	I <sup>e</sup>	NP	2	NP	2	NP	1	NP	I	2	1	2	2	NP	NP	NP	4	NP	4	NP	4	NP	
I-2, I-2.1	—	—	—	—	N	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	4	NP	4	NP	4	NP	
I-3	—	—	—	—	—	—	N	NP	2	NP	2	2	2	2	2	NP	NP	NP	4	NP	4	NP	4	NP	
R-1, R-2, R-3, R-3.1, R-4	—	—	—	—	—	—	—	—	N	N	I <sup>c</sup>	2 <sup>e</sup>	1	2	4	NP	NP	NP	3	NP	2	NP	2	NP	
F-2, S-2 <sup>b</sup> , U	—	—	—	—	—	—	—	—	N	N	N	N	1	2	I	NP	NP	NP	3	4	2	3 <sup>a</sup>	2	NP	
B, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	—	—	N	N	I	NP	NP	NP	2	3	1	2 <sup>a</sup>	1	NP	
L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	I	NP	NP	NP	2	NP	I	NP	I	NP
H-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP	NP	NP	
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP	1	NP		
H-3, H-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 <sup>d</sup>	NP	1	NP	
H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	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.

a. See Section 420.

b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.

c. See Section 406.3.4.

d. Separation is not required between occupancies of the same classification.

e. [SFM] Group I and F1 occupancies and Group R-2.1 and F-1 occupancies shall have a 3 hour separation.

**509.4.1 Separation.** Where Table 509 specifies a fire-resistance-rated separation, the incidental uses shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both. Construction supporting 1-hour fire barriers or horizontal assemblies used for incidental use separations in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

**509.4.2 Protection.** Where Table 509 permits an automatic sprinkler system without a fire barrier, the incidental uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor assembly or roof assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic-closing upon detection of smoke in accordance with Section 716.5.9.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental use shall not have air transfer

openings unless provided with smoke dampers in accordance with Section 710.7.

**509.4.2.1 Protection limitation.** Except as specified in Table 509 for certain incidental uses, where an automatic sprinkler system is provided in accordance with Table 509, only the space occupied by the incidental use need be equipped with such a system.

## SECTION 510 SPECIAL PROVISIONS

**510.1 General.** The provisions in Sections 510.2 through 510.9 shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable building heights and areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code. The provisions of Sections 510.2 through 510.8 are to be considered independent and separate from each other.

**510.2 Horizontal building separation allowance.** A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of fire

**TABLE 509**  
**INCIDENTAL USES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system <sup>a</sup>
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system <sup>a</sup>
Refrigerant machinery room	1 hour or provide automatic sprinkler system <sup>a</sup>
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
Laboratories and vocational shops, not classified as Group H, located in Group I 2 and I 2.1 occupancies	1 hour or provide automatic fire extinguishing system <sup>a</sup>
<i>[SFM] Rooms or areas with special hazards such as laboratories, vocational shops and other such areas not classified as Group H, located in Group E occupancies where hazardous materials in quantities not exceeding the maximum allowable quantity are used or stored.</i>	1 hour
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system <sup>a</sup>
Waste and linen collection rooms located in either Group I 2, I 2.1 occupancies or ambulatory care facilities	1 hour <sup>a</sup>
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies <sup>a</sup>

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

a. [SFM] Fire barrier protection and automatic sprinkler protection required throughout the fire area in I 2 and I 2.1 occupancies as indicated.

walls, limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a fire-resistance rating of not less than 3 hours.
2. The building below the horizontal assembly is not greater than one story above grade plane.
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Section 716.5.

**Exception:** Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Section 716.5, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
2. The enclosure connects fewer than four stories; and
3. The enclosure opening protectives above the horizontal assembly have a fire protection rating of not less than 1 hour.
4. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A occupancies, each with an occupant load of less 300, or Group B, M, R or S occupancies.
5. The building below the horizontal assembly shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:
  - 6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;
  - 6.2. Multiple Group A, each with an occupant load of less than 300;

- 6.3. Group B;
  - 6.4. Group M;
  - 6.5. Group R; and
  - 6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).
7. The maximum building height in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

**510.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above.** A Group S-2 enclosed parking garage with not more than one story above grade plane and located below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.
3. The height and the number of tiers of the Group S-2 open parking garage shall be limited as specified in Table 406.5.4.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m<sup>2</sup>), and mechanical equipment rooms incidental to the operation of the building.

**510.4 Parking beneath Group R.** Where a maximum one story above grade plane Group S-2 parking garage, enclosed or open, or combination thereof, of Type I construction or open of Type IV construction, with grade entrance, is provided under a building of Group R, the number of stories to be used in determining the minimum type of construction shall be measured from the floor above such a parking area. The floor assembly between the parking garage and the Group R above shall comply with the type of construction required for the parking garage and shall also provide a fire-resistance rating not less than the mixed occupancy separation required in Section 508.4.

**510.5 Group R-1 and R-2 buildings of Type IIIA construction.** The height limitation for buildings of Type IIIA construction in Groups R-1 and R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first floor assem-

bly above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m<sup>2</sup>).

**510.6 Group R-1 and R-2 buildings of Type II A construction.** The height limitation for buildings of Type II A construction in Groups R-1 and R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first floor assembly has a fire-resistance rating of not less than 1½ hours.

**510.7 Open parking garage beneath Groups A, I, B, M and R.** Open parking garages constructed under Groups A, I, B, M and R shall not exceed the height and area limitations permitted under Section 406.5. The height and area of the portion of the building above the open parking garage shall not exceed the limitations in Section 503 for the upper occupancy. The height, in both feet and stories, of the portion of the building above the open parking garage shall be measured from grade plane and shall include both the open parking garage and the portion of the building above the parking garage.

**510.7.1 Fire separation.** Fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711 between the parking occupancy and the upper occupancy shall correspond to the required fire-resistance rating prescribed in Table 508.4 for the uses involved. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking structure, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. Means of egress for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by fire barriers having not less than a 2-hour fire-resistance rating as required by Section 707 with self-closing doors complying with Section 716 or horizontal assemblies having not less than a 2-hour fire-resistance rating as required by Section 711, with self-closing doors complying with Section 716. *Means of egress from the open parking garage shall comply with Section 406.5.*

**510.8 Group B or M with Group S-2 open parking garage.** Group B or M occupancies located not higher than the first story above grade plane shall be considered as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a fire-resistance rating of not less than 2 hours.
2. The occupancies in the building below the horizontal assembly are limited to Groups B and M.
3. The occupancy above the horizontal assembly is limited to a Group S-2 open parking garage.

4. The building below the horizontal assembly is of Type I or II construction but not less than the type of construction required for the Group S-2 open parking garage above.
5. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503.
6. The height and area of the Group S-2 open parking garage does not exceed the limits set forth in Section 405.5. The height, in both feet and stories, of the Group S-2 open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly.
7. Exits serving the Group S-2 open parking garage discharge directly to a street or public way and are separated from the building below the horizontal assembly by 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

**510.9 Multiple buildings above a horizontal assembly.**

Where two or more buildings are provided above the horizontal assembly separating a Group S-2 parking garage or building below from the buildings above in accordance with the special provisions in Sections 510.2, 510.3 or 510.8, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings from each other and shall comply with all other provisions of this code as applicable to each separate and distinct building.

**510.10 Group R. [SFM]** *Buildings housing protective social care homes or in occupancies housing inmates who are not restrained need not be of one-hour fire- resistive construction when not more than two stories in height. In no case shall individual floor areas exceed 3,000 square feet (279 m<sup>2</sup>). The fire-resistive protection of the exterior walls shall not be less than one hour where such walls are located within 5 feet (1524 mm) of the property line. Openings within such walls are not permitted. Openings in exterior nonrated walls need not be protected.*



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 6 – TYPES OF CONSTRUCTION

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X		X	X			X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)		X																		
Adopt only those sections that are listed below																				
Chapter / Section																				
Table 601		X																		
602.1		X																		
Table 602		X																		
603.1		X																		
603.1.1		X																		
603.1.2		X																		
603.1.3		X																		



# CHAPTER 6

## TYPES OF CONSTRUCTION

### SECTION 601 GENERAL

**601.1 Scope.** The provisions of this chapter shall control the classification of buildings as to type of construction.

### SECTION 602 CONSTRUCTION CLASSIFICATION

**602.1 General.** Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602. Where required to have a fire-resistance rating by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The pro-

tection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

**Exception:** Noncombustible structural members supporting solar photovoltaic panels are not required to meet the fire resistance rating for the following:

1. Photovoltaic panel supported by a structure and having no use underneath. Signs may be provided, as determined by the enforcing agency prohibiting any use underneath including storage.
2. Solar photovoltaic (PV) panels supported by non-combustible framing that have sufficient uniformly distributed and unobstructed openings throughout the top of the array (horizontal plane) to allow heat and gases to escape, as determined by the enforcing agency.

**TABLE 601**  
**FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A <sup>d</sup>	B	A <sup>d</sup>	B		A <sup>d</sup>	B
Primary structural frame <sup>e</sup> (see Section 202)	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	HT	1	0
Bearing walls									
Exterior <sup>f,g</sup>	3	2	1	0	2	2	2	1	0
Interior	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions							See Table 602		
Exterior							See Table 602		
Nonbearing walls and partitions	0	0	0	0	0	0	See Section 602.4.6	0	0
Interior <sup>e</sup>									
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 <sup>b,c</sup>	1 <sup>b,c</sup>	1 <sup>b,c</sup>	0 <sup>c</sup>	1 <sup>b,c</sup>	0	HT	1 <sup>b,c</sup>	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b.1 Except in Group A, E, F 1, H, I, L, M, R 1, R 2, R 2.1 and S 1 occupancies, high rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire retardant treated wood members shall be allowed to be used for such unprotected members.
- b.2 For Group A, E, I, L, R 1, R 2 and R 2.1 occupancies, high rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, fire protection of members other than the structural frame shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire retardant treated wood members shall be allowed to be used for such unprotected members.
- b.3 For one story portions of Group A and E assembly occupancies the roof framing system of Type II A or Type III A construction may be of unprotected construction when such roof-framing system is open to the assembly area and does not contain concealed spaces.
- c. In all occupancies, heavy timber shall be allowed where a 1 hour or less fire resistance rating is required.
- d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1 hour fire resistance rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1 hour substitution for the fire resistance of exterior walls shall not be permitted.
- e. Not less than the fire resistance rating required by other sections of this code.
- f. Not less than the fire resistance rating based on fire separation distance (see Table 602).
- g. Not less than the fire resistance rating as referenced in Section 704.10

3. Solar photovoltaic panels supported by a structure over parking stalls where the panels constitute the roof and all the following conditions are met (see Figure 5-1):
- 3.1. The area within the perimeter of the solar photovoltaic array has maximum rectangular dimension of 40 feet by 150 feet.
  - 3.2. The distance between solar photovoltaic array structures is a minimum of 10 feet clear.
  - 3.3. The driveway aisle separating solar photovoltaic array structures has a minimum width of 25 feet clear.
  - 3.4. Solar photovoltaic array structure is used only for parking purposes with no storage.
  - 3.5. Completely open on all sides (other than necessary structural supports) with no interior partitions.

**602.1.1 Minimum requirements.** A building or portion thereof shall not be required to conform to the details of a type of construction higher than that type which meets the minimum requirements based on occupancy even though certain features of such a building actually conform to a higher type of construction.

**602.2 Types I and II.** Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code.

**602.3 Type III.** Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

**602.4 Type IV.** Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less. Minimum solid sawn nominal dimensions are required for structures built using Type IV construction (HT). For glued-laminated members the equivalent net finished width and depths corresponding to the minimum nominal width and depths of solid sawn lumber are required as specified in Table 602.4.

TABLE 602.4  
WOOD MEMBER SIZE EQUIVALENCIES

MINIMUM NOMINAL SOLID SAWN SIZE		MINIMUM GLUED-LAMINATED NET SIZE	
Width, inch	Depth, inch	Width, inch	Depth, inch
8	8	6 $\frac{3}{4}$	8 $\frac{1}{4}$
6	10	5	10 $\frac{1}{2}$
6	8	5	8 $\frac{1}{4}$
6	6	5	6
4	6	3	6 $\frac{7}{8}$

For SI: 1 inch = 25.4 mm.

**602.4.1 Columns.** Wood columns shall be sawn or glued laminated and shall be not less than 8 inches (203 mm), nominal, in any dimension where supporting floor loads and not less than 6 inches (152 mm) nominal in width and not less than 8 inches (203 mm) nominal in depth where supporting roof and ceiling loads only. Columns shall be continuous or superimposed and connected in an approved manner.

TABLE 602  
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE<sup>a, e</sup>

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H <sup>c</sup> , L	OCCUPANCY GROUP F-1, M, S-1 <sup>d</sup>	OCCUPANCY GROUP A, B, E, F-2, I, R <sup>b, f</sup> , S-2 <sup>g</sup> , U <sup>b, h, i</sup>
x < 5 <sup>c</sup>	All	3	2	1
5 ≤ x < 10	IA Others	3 2	2 1	1 1
10 ≤ x < 30	IA, IB IIB, VB Others	2 1 1	1 0 1	1 <sup>d</sup> 0 1 <sup>d</sup>
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

- a. Load bearing exterior walls shall also comply with the fire resistance rating requirements of Table 601.
- b. For special requirements for Group U occupancies, see Section 406.3.
- c. See Section 706.1.1 for party walls.
- d. Open parking garages complying with Section 406 shall not be required to have a fire resistance rating.
- e. The fire resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- f. For special requirements for Group H occupancies, see Section 415.5.
- g. For special requirements for Group S aircraft hangars, see Section 412.4.1.
- h. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire resistance rating for the exterior walls is 0 hours.
- i. *Group R 3 and Group U occupancies when used as accessory to Group R 3 occupancies, shall not be required to have a fire resistance rating where the fire separation distance is 5 feet or more; or when equipped throughout with an automatic residential fire sprinkler system installed in accordance with Section 903.3 the fire resistance rating shall not be required where the fire separation distance is 3 feet or more.*

**602.4.2 Floor framing.** Wood beams and girders shall be of sawn or glued-laminated timber and shall be not less than 6 inches (152 mm) nominal in width and not less than 10 inches (254 mm) nominal in depth. Framed sawn or glued-laminated timber arches, which spring from the floor line and support floor loads, shall be not less than 8 inches (203 mm) nominal in any dimension. Framed timber trusses supporting floor loads shall have members of not less than 8 inches (203 mm) nominal in any dimension.

**602.4.3 Roof framing.** Wood-frame or glued-laminated arches for roof construction, which spring from the floor line or from grade and do not support floor loads, shall have members not less than 6 inches (152 mm) nominal in width and have not less than 8 inches (203 mm) nominal in depth for the lower half of the height and not less than 6 inches (152 mm) nominal in depth for the upper half. Framed or glued-laminated arches for roof construction that spring from the top of walls or wall abutments, framed timber trusses and other roof framing, which do not support floor loads, shall have members not less than 4 inches (102 mm) nominal in width and not less than 6 inches (152 mm) nominal in depth. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.

**602.4.4 Floors.** Floors shall be without concealed spaces. Wood floors shall be of sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or diagonally, or 0.5-inch (12.7 mm) particleboard or planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or  $\frac{15}{32}$ -inch (12 mm) wood structural panel or 0.5-inch (12.7 mm) particleboard. The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than 0.5 inch (12.7 mm) to walls. Such 0.5-inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbeling of masonry walls under the floor shall be permitted to be used in place of molding.

**602.4.5 Roofs.** Roofs shall be without concealed spaces and wood roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than 2 inches (51 mm) nominal in thickness,  $1\frac{1}{8}$ -inch-thick (32 mm) wood structural panel (exterior glue), or of planks not less than 3 inches (76 mm) nominal in width, set on edge close together and laid as required for floors. Other types of

decking shall be permitted to be used if providing equivalent fire resistance and structural properties.

**602.4.6 Partitions.** Partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

**602.4.7 Exterior structural members.** Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes shall be permitted to be used externally.

**602.5 Type V.** Type V construction is that type of construction in which the structural elements, exterior walls and interior walls are of any materials permitted by this code.

### SECTION 603 COMBUSTIBLE MATERIAL IN TYPE I AND II CONSTRUCTION

**603.1 Allowable materials.** Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
  - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
  - 1.2. Nonbearing exterior walls where fire-resistance rated construction is not required.
  - 1.3. Roof construction, including girders, trusses, framing and decking.

**Exception:** In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

#### Exceptions:

1. Insulation placed between two layers of non-combustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. Interior floor finish and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.

7. Interior wall and ceiling finishes installed in accordance with Sections 801 and 803.
8. Trim installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
13. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.4.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.7 and 1406.3.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire-resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.13 and 1705.14, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the *California Mechanical Code*.

**603.1.1 Ducts.** The use of nonmetallic ducts shall be permitted where installed in accordance with the limitations of the *California Mechanical Code*.

**603.1.2 Piping.** The use of combustible piping materials shall be permitted where installed in accordance with the limitations of the *California Mechanical Code* and the *California Plumbing Code*.

**603.1.3 Electrical.** The use of electrical wiring methods with combustible insulation, tubing, raceways and related components shall be permitted where installed in accordance with the limitations of the *California Electrical Code*.

## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE CHAPTER 7 – FIRE AND SMOKE PROTECTION FEATURES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X					X	X		X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X									X			X		
Chapter / Section																				
702.1		X																		
703.4																				
703.5																				
705.5		X																		
705.8.1		X																		
705.8.5		X																		
705.12		X																		
Table 706.4		X																		
707.1		X																		
Table 707.3.10		X																		
708.1		X																		
708.3		X																		
708.4		X																		
710.2		X																		
710.8		X																		
712.1.3		X																		
712.1.5		X																		
712.1.8		X																		
713.14.1		X																		
716.5.3		X																		
716.5.5		X																		
716.5.5.1		X																		
716.5.7.1		X																		
716.5.9.3		X																		
717.2.2		X																		
717.5.2		X																		
717.5.3		X																		
717.5.4		X																		
717.5.4.1		X																		
717.6.1		X																		
717.6.2		X																		
717.6.3		X																		
718.3.3		X																		
718.4.3		X																		
718.5		X																		
720.1		X																		
720.7		X																		
721.2				X	X															
821.2.1				X	X															



# CHAPTER 7

## FIRE AND SMOKE PROTECTION FEATURES

### SECTION 701 GENERAL

**701.1 Scope.** The provisions of this chapter shall govern the materials, systems and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings.

**701.2 Multiple use fire assemblies.** Fire assemblies that serve multiple purposes in a building shall comply with all of the requirements that are applicable for each of the individual fire assemblies.

### SECTION 702 DEFINITIONS

**702.1 Definitions.** The following terms are defined in Chapter 2:

**ANNULAR SPACE.**

**BUILDING ELEMENT.**

**CEILING RADIATION DAMPER.**

**COMBINATION FIRE/SMOKE DAMPER.**

**DAMPER.**

**DRAFTSTOP**

**F RATING.**

**FIRE BARRIER.**

**FIRE DAMPER.**

**FIRE DOOR.**

**FIRE DOOR ASSEMBLY.**

**FIRE PARTITION.**

**FIRE PROTECTION RATING.**

**FIRE-RATED GLAZING.**

**FIRE RESISTANCE.**

**FIRE-RESISTANCE RATING.**

**FIRE-RESISTANT JOINT SYSTEM.**

**FIRE SEPARATION DISTANCE.**

**FIRE-SMOKE BARRIER.**

**FIRE WALL.**

**FIRE WINDOW ASSEMBLY.**

**FIREBLOCKING.**

**FLOOR FIRE DOOR ASSEMBLY.**

**HORIZONTAL ASSEMBLY.**

**JOINT.**

**L RATING.**

**MEMBRANE PENETRATION.**

**MEMBRANE-PENETRATION FIRESTOP.**

**MEMBRANE-PENETRATION FIRESTOP SYSTEM.**

**MINERAL FIBER.**

**MINERAL WOOL.**

**PENETRATION FIRESTOP.**

**SELF-CLOSING.**

**SHAFT.**

**SHAFT ENCLOSURE.**

**SMOKE BARRIER.**

**SMOKE COMPARTMENT.**

**SMOKE DAMPER.**

**SPLICE.**

**T RATING.**

**THROUGH PENETRATION.**

**THROUGH-PENETRATION FIRESTOP SYSTEM.**

### SECTION 703 FIRE-RESISTANCE RATINGS AND FIRE TESTS

**703.1 Scope.** Materials prescribed herein for fire resistance shall conform to the requirements of this chapter.

**703.2 Fire-resistance ratings.** The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire-resistance rating.

**Exception:** In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 or UL 263 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior non-bearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with

ASTM E 119 or UL 263, the fire exposure time period, water pressure and application duration criteria for the hose stream test of ASTM E 119 or UL 263 shall be based upon the fire-resistance rating determined in accordance with this exception.

**703.2.1 Nonsymmetrical wall construction.** Interior walls and partitions of nonsymmetrical construction shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests conducted in compliance with ASTM E 119 or UL 263. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side (see Section 705.5 for exterior walls).

**703.2.2 Combustible components.** Combustible aggregates are permitted in gypsum and Portland cement concrete mixtures for fire-resistance-rated construction. Any component material or admixture is permitted in assemblies if the resulting tested assembly meets the fire-resistance test requirements of this code.

**703.2.3 Restrained classification.** Fire-resistance-rated assemblies tested under ASTM E 119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the building official is furnished by the registered design professional showing that the construction qualifies for a restrained classification in accordance with ASTM E 119 or UL 263. Restrained construction shall be identified on the plans.

**703.3 Alternative methods for determining fire resistance.** The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263. The required fire resistance of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.

**703.4 Automatic sprinklers.** Under the prescriptive fire-resistance requirements of the *California Building Code*, the fire-resistance rating of a building element, component or assembly shall be established without the use of automatic sprinklers or any other fire suppression system being incorporated as part of the assembly tested in accordance with the fire exposure, procedures, and acceptance criteria specified in ASTM E 119 or UL 263. However, this section shall not pro-

hibit or limit the duties and powers of the building official allowed by Sections 104.10 and 104.11.

**703.5 Noncombustibility tests.** The tests indicated in Sections 703.5.1 and 703.5.2 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Type I, II, III and IV construction. The term "noncombustible" does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

**703.5.1 Elementary materials.** Materials required to be noncombustible shall be tested in accordance with ASTM E 136.

**703.5.2 Composite materials.** Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.

**703.6 Fire-resistance-rated glazing.** Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a label marked in accordance with Table 716.3 issued by an agency and shall be permanently identified on the glazing.

**703.7 Marking and identification.** Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located in accessible concealed floor, floor-ceiling or attic spaces;
2. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition; and
3. Include lettering not less than 3 inches (76 mm) in height with a minimum  $\frac{3}{8}$  inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording. "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS" or other wording.

**Exception:** Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

## SECTION 704 FIRE-RESISTANCE RATING OF STRUCTURAL MEMBERS

**704.1 Requirements.** The fire-resistance ratings of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601. The fire-resistance ratings shall not be less than

the ratings required for the fire-resistance-rated assemblies supported by the structural members.

**Exception:** Fire barriers, fire partitions, smoke barriers and horizontal assemblies as provided in Sections 707.5, 708.4, 709.4 and 711.4, respectively.

**704.2 Column protection.** Where columns are required to have protection to be fire-resistance rated, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

**704.3 Protection of the primary structural frame other than columns.** Members of the primary structural frame other than columns that are required to have protection to achieve a fire-resistance rating and support more than two floors or one floor and roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be provided individual encasement protection by protecting them on all sides for the full length, including connections to other structural members, with materials having the required fire-resistance rating.

**Exception:** Individual encasement protection on all sides shall be permitted on all exposed sides provided the extent of protection is in accordance with the required fire-resistance rating, as determined in Section 703.

**704.4 Protection of secondary members.** Secondary members that are required to have a fire-resistance rating shall be protected by individual encasement protection, by the membrane or ceiling of a horizontal assembly in accordance with Section 711, or by a combination of both.

**704.4.1 Light-frame construction.** King studs and boundary elements that are integral elements in load-bearing walls of light-frame construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

**704.5 Truss protection.** The required thickness and construction of fire-resistance-rated assemblies enclosing trusses shall be based on the results of full-scale tests or combinations of tests on truss components or on approved calculations based on such tests that satisfactorily demonstrate that the assembly has the required fire resistance.

**704.6 Attachments to structural members.** The edges of lugs, brackets, rivets and bolt heads attached to structural members shall be permitted to extend to within 1 inch (25 mm) of the surface of the fire protection.

**704.7 Reinforcing.** Thickness of protection for concrete or masonry reinforcement shall be measured to the outside of the reinforcement except that stirrups and spiral reinforcement ties are permitted to project not more than 0.5-inch (12.7 mm) into the protection.

**704.8 Embedments and enclosures.** Pipes, wires, conduits, ducts or other service facilities shall not be embedded in the required fire protective covering of a structural member that is required to be individually encased.

**704.9 Impact protection.** Where the fire protective covering of a structural member is subject to impact damage from moving vehicles, the handling of merchandise or other activity, the fire protective covering shall be protected by corner guards or by a substantial jacket of metal or other noncombustible material to a height adequate to provide full protection, but not less than 5 feet (1524 mm) from the finished floor.

**Exception:** Corner protection is not required on concrete columns in open or enclosed parking garages.

**704.10 Exterior structural members.** Load-bearing structural members located within the exterior walls or on the outside of a building or structure shall be provided with the highest fire-resistance rating as determined in accordance with the following:

1. As required by Table 601 for the type of building element based on the type of construction of the building;
2. As required by Table 601 for exterior bearing walls based on the type of construction; and
3. As required by Table 602 for exterior walls based on the fire separation distance.

**704.11 Bottom flange protection.** Fire protection is not required at the bottom flange of lintels, shelf angles and plates; spanning not more than 6 feet 4 inches (1931 mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the structural frame, regardless of span.

**704.12 Seismic isolation systems.** Fire-resistance ratings for the isolation system shall meet the fire-resistance rating required for the columns, walls or other structural elements in which the isolation system is installed in accordance with Table 601. Isolation systems required to have a fire-resistance rating shall be protected with approved materials or construction assemblies designed to provide the same degree of fire resistance as the structural element in which it is installed when tested in accordance with ASTM E 119 or UL 263 (see Section 703.2).

Such isolation system protection applied to isolator units shall be capable of retarding the transfer of heat to the isolator unit in such a manner that the required gravity load-carrying capacity of the isolator unit will not be impaired after exposure to the standard time-temperature curve fire test prescribed in ASTM E 119 or UL 263 for a duration not less than that required for the fire-resistance rating of the structure element in which it is installed.

Such isolation system protection applied to isolator units shall be suitably designed and securely installed so as not to dislodge, loosen, sustain damage or otherwise impair its ability to accommodate the seismic movements for which the isolator unit is designed and to maintain its integrity for the purpose of providing the required fire-resistance protection.

**704.13 Sprayed fire-resistant materials (SFRM).** Sprayed fire-resistant materials (SFRM) shall comply with Sections 704.13.1 through 704.13.5.

**704.13.1 Fire-resistance rating.** The application of SFRM shall be consistent with the fire-resistance rating

and the listing, including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions and the use of bonding adhesives, sealants, reinforcing or other materials.

**704.13.2 Manufacturer's installation instructions.** The application of SFRM shall be in accordance with the manufacturer's installation instructions. The instructions shall include, but are not limited to, substrate temperatures and surface conditions and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

**704.13.3 Substrate condition.** The SFRM shall be applied to a substrate in compliance with Sections 704.13.3.1 through 704.13.3.2.

**704.13.3.1 Surface conditions.** Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale and any other condition that prevents adhesion. The substrates shall also be free of primers, paints and encapsulants other than those fire tested and listed by a nationally recognized testing agency. Primed, painted or encapsulated steel shall be allowed, provided that testing has demonstrated that required adhesion is maintained.

**704.13.3.2 Primers, paints and encapsulants.** Where the SFRM is to be applied over primers, paints or encapsulants other than those specified in the listing, the material shall be field tested in accordance with ASTM E 736. Where testing of the SFRM with primers, paints or encapsulants demonstrates that required adhesion is maintained, SFRM shall be permitted to be applied to primed, painted or encapsulated wide flange steel shapes in accordance with the following conditions:

1. The beam flange width does not exceed 12 inches (305 mm); or
2. The column flange width does not exceed 16 inches (400 mm); or
3. The beam or column web depth does not exceed 16 inches (400 mm).
4. The average and minimum bond strength values shall be determined based on a minimum of five bond tests conducted in accordance with ASTM E 736. Bond tests conducted in accordance with ASTM E 736 shall indicate a minimum average bond strength of 80 percent and a minimum individual bond strength of 50 percent, when compared to the bond strength of the SFRM as applied to clean uncoated  $\frac{1}{8}$ -inch thick (3 mm) steel plate.

**704.13.4 Temperature.** A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for a minimum of 24 hours after the application of the SFRM, unless the manufacturer's installation instructions allow otherwise.

**704.13.5 Finished condition.** The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids,

spalls, delamination or any exposure of the substrate. Surface irregularities of SFRM shall be deemed acceptable.

## SECTION 705 EXTERIOR WALLS

**705.1 General.** Exterior walls shall comply with this section.

**705.2 Projections.** Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend any closer to the line used to determine the fire separation distance than shown in Table 705.2.

**TABLE 705.2  
MINIMUM DISTANCE OF PROJECTION**

FIRE SEPARATION DISTANCE (FSD)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 feet to less than 2 feet	Projections not permitted
2 feet to less than 5 feet	24 inches
5 feet or greater	40 inches

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

**Exception:** Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

**705.2.1 Type I and II construction.** Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.

**705.2.2 Type III, IV or V construction.** Projections from walls of Type III, IV or V construction shall be of any approved material.

**705.2.3 Combustible projections.** Combustible projections extending to within 5 feet (1524 mm) of the line used to determine the fire separation distance, or located where openings are not permitted, or where protection of some openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

**Exception:** Type VB construction shall be allowed for combustible projections in Group R-3 and U occupancies with a fire separation distance greater than or equal to 5 feet (1524 mm).

**705.3 Buildings on the same lot.** For the purposes of determining the required wall and opening protection, projections and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them.

Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the exterior wall and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

**Exception:** Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5

for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

**705.4 Materials.** Exterior walls shall be of materials permitted by the building type of construction.

**705.5 Fire-resistance ratings.** *For other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, exterior walls shall be fire-resistance rated in accordance with Tables 601 and 602 and this section. The required fire-resistance rating of exterior walls with a fire separation distance of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.*

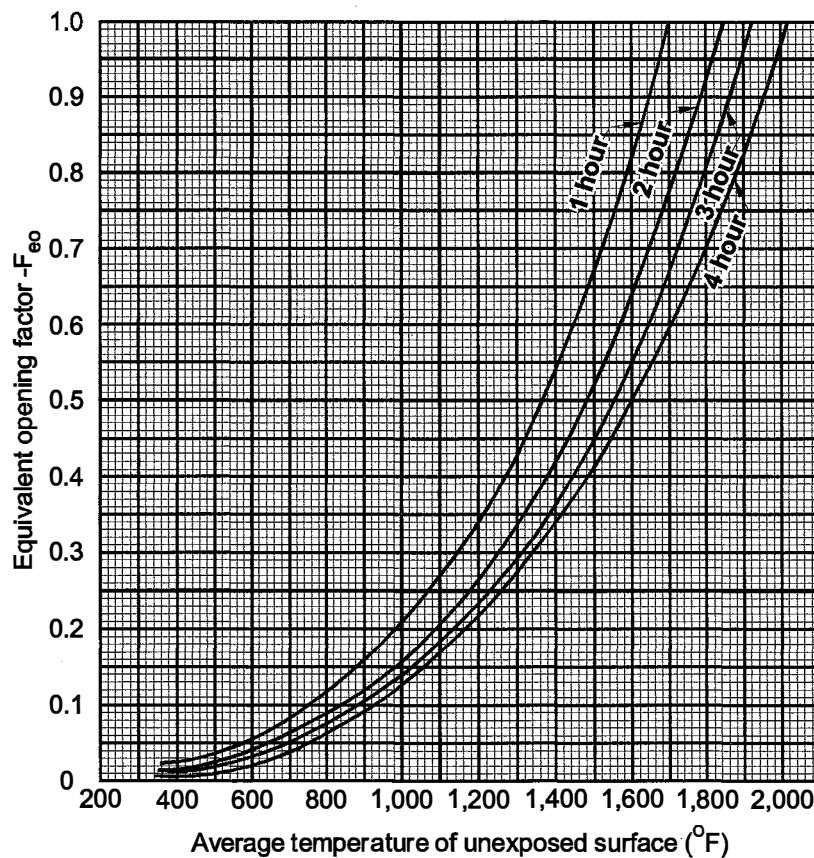
*For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, exterior walls shall be fire-resistance rated in accordance with Tables 601 and 602 and this section. The required fire-resistance rating of exterior walls shall be rated for exposure to fire from both sides.*

**705.6 Structural stability.** The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating. Where exterior walls have a minimum fire separation distance of not less than 30 feet (9144 mm), interior structural elements which brace the exterior wall but which are not located within the plane of the exterior wall shall have the minimum fire-resistance rating required in Table 601 for that structural element. Structural elements which brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum fire-resistance rating required in Tables 601 and 602 for the exterior wall.

**705.7 Unexposed surface temperature.** Where protected openings are not limited by Section 705.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 or UL 263 shall not apply. Where protected openings are limited by Section 705.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 or UL 263 shall not apply provided that a correction is made for radiation from the unexposed exterior wall surface in accordance with the following formula:

$$A_c = A + (A_t \times F_{eo})$$

(Equation 7-1)



For SI:  $^{\circ}\text{C} = [({}^{\circ}\text{F}) - 32] / 1.8$ .

FIGURE 705.7  
EQUIVALENT OPENING FACTOR

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where:

$A_e$  = Equivalent area of protected openings.

$A$  = Actual area of protected openings.

$A_f$  = Area of exterior wall surface in the story under consideration exclusive of openings, on which the temperature limitations of ASTM E 119 or UL 263 for walls are exceeded.

$F_{eo}$  = An "equivalent opening factor" derived from Figure 705.7 based on the average temperature of the unexposed wall surface and the fire-resistance rating of the wall.

**705.8 Openings.** Openings in exterior walls shall comply with Sections 705.8.1 through 705.8.6.

**705.8.1 Allowable area of openings.** The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8.

### Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the first story above grade plane either:

1.1. Where the wall faces a street and has a fire separation distance of more than 15 feet (4572 mm); or

1.2. Where the wall faces an unoccupied space. The unoccupied space shall be on

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

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA <sup>a</sup>
0 to less than 3 <sup>b, c</sup>	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5 <sup>d, e</sup>	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	15%
	Protected (P)	15%
5 to less than 10 <sup>e, f, i</sup>	Unprotected, Nonsprinklered (UP, NS)	10% <sup>h</sup>
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	25%
	Protected (P)	25%
10 to less than 15 <sup>e, f, g</sup>	Unprotected, Nonsprinklered (UP, NS)	15% <sup>h</sup>
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	45%
	Protected (P)	45%
15 to less than 20 <sup>f, g</sup>	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	75%
	Protected (P)	75%
20 to less than 25 <sup>f, g</sup>	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	No Limit
	Protected (P)	No Limit
25 to less than 30 <sup>f, g</sup>	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S) <sup>i</sup>	Not Required
	Protected (P)	Not Required

For SI: 1 foot = 304.8 mm.

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.

a. Values indicated are the percentage of the area of the exterior wall, per story.

b. For the requirements for fire walls of buildings with differing heights, see Section 706.6.1.

c. For openings in a fire wall for buildings on the same lot, see Section 706.8.

d. The maximum percentage of unprotected and protected openings shall be 25 percent for Group R 3 occupancies.

e. Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H 2 and H 3 occupancies.

f. The area of unprotected and protected openings shall not be limited for Group R 3 occupancies, with a fire separation distance of 5 feet or greater.

g. The area of openings in an open parking structure with a fire separation distance of 10 feet or greater shall not be limited.

h. Includes buildings accessory to Group R 3.

i. Not applicable to Group H 1, H 2 and H 3 occupancies.

j. For special requirements for Group U occupancies, see Section 406.3.2.

- the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width and shall have access from a street by a posted fire lane in accordance with the *California Fire Code*.
2. Buildings whose exterior bearing walls, exterior nonbearing walls and exterior primary structural frame are not required to be fire-resistance rated shall be permitted to have unlimited unprotected openings.

**705.8.2 Protected openings.** Where openings are required to be protected, fire doors and fire shutters shall comply with Section 716.5 and fire window assemblies shall comply with Section 716.6.

**Exception:** Opening protectives are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and the exterior openings are protected by a water curtain using automatic sprinklers approved for that use.

**705.8.3 Unprotected openings.** Where unprotected openings are permitted, windows and doors shall be constructed of any approved materials. Glazing shall conform to the requirements of Chapters 24 and 26.

**705.8.4 Mixed openings.** Where both unprotected and protected openings are located in the exterior wall in any story of a building, the total area of openings shall be determined in accordance with the following:

$$(A_p/a_p) + (A_u/a_u) \leq 1 \quad (\text{Equation 7-2})$$

where:

$A_p$  = Actual area of protected openings, or the equivalent area of protected openings,  $A_e$  (see Section 705.7).

$a_p$  = Allowable area of protected openings.

$A_u$  = Actual area of unprotected openings.

$a_u$  = Allowable area of unprotected openings.

**705.8.5 Vertical separation of openings.** Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower story is not a protected opening with a fire protection rating of not less than  $\frac{3}{4}$  hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, exterior walls or other similar assemblies that have a fire-resistance rating of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the exterior wall. Flame barriers shall also have a fire-resistance rating of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 or UL 263 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

**Exceptions:**

1. This section shall not apply to buildings that are three stories or less above grade plane.

2. This section shall not apply to buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. Open parking garages.

**705.8.6 Vertical exposure.** For buildings on the same lot, opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the fire separation distance between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm).

**Exceptions:**

1. Opening protectives are not required where the roof assembly of the adjacent building or structure has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with Section 705.8.6.

**705.9 Joints.** Joints made in or between exterior walls required by this section to have a fire-resistance rating shall comply with Section 715.

**Exception:** Joints in exterior walls that are permitted to have unprotected openings.

**705.9.1 Voids.** The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 715.4.

**705.10 Ducts and air transfer openings.** Penetrations by air ducts and air transfer openings in fire-resistance-rated exterior walls required to have protected openings shall comply with Section 717.

**Exception:** Foundation vents installed in accordance with this code are permitted.

**705.11 Parapets.** Parapets shall be provided on exterior walls of buildings.

**Exceptions:** A parapet need not be provided on an exterior wall where any of the following conditions exist:

1. The wall is not required to be fire-resistance rated in accordance with Table 602 because of fire separation distance.
2. The building has an area of not more than 1,000 square feet ( $93 \text{ m}^2$ ) on any floor.
3. Walls that terminate at roofs of not less than 2-hour fire-resistance-rated construction or where the roof, including the deck or slab and supporting construction, is constructed entirely of noncombustible materials.

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4. One-hour fire-resistance-rated exterior walls that terminate at the underside of the roof sheathing, deck or slab, provided:
  - 4.1. Where the roof/ceiling framing elements are parallel to the walls, such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction for a width of 4 feet (1220 mm) for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
  - 4.2. Where roof/ceiling framing elements are not parallel to the wall, the entire span of such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction.
  - 4.3. Openings in the roof shall not be located within 5 feet (1524 mm) of the 1-hour fire-resistance-rated exterior wall for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
  - 4.4. The entire building shall be provided with not less than a Class B roof covering.
5. In Groups R-2 and R-3 where the entire building is provided with a Class C roof covering, the exterior wall shall be permitted to terminate at the underside of the roof sheathing or deck in Type III, IV and V construction, provided:
  - 5.1. The roof sheathing or deck is constructed of approved noncombustible materials or of fire-retardant-treated wood for a distance of 4 feet (1220 mm); or
  - 5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm).

**705.11.1 Parapet construction.** Parapets shall have the same fire-resistance rating as that required for the supporting wall, and on any side adjacent to a roof surface, shall have noncombustible faces for the uppermost 18 inches (457 mm), including counterflashing and coping materials. The height of the parapet shall not be less than 30 inches (762 mm) above the point where the roof surface and the wall intersect. Where the roof slopes toward a parapet at a slope greater than two units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a fire separation distance where protection of wall openings is required, but

in no case shall the height be less than 30 inches (762 mm).

**705.12 Exterior graphics on exterior walls of high-rise buildings.** Where installed on the exterior walls of high-rise buildings, exterior graphics, both permanent and temporary, greater than 100 square feet in area or greater than 10 feet in either dimension shall comply with the following conditions subject to the review and approval of the fire code official and building official:

1. The materials used for graphics installed at a height greater than 40 feet above the grade plane shall be noncombustible materials or shall have a flame spread index not greater than 25 when tested in accordance with ASTM E 84 or UL 723.
2. The method of attachment and mounting of the graphics to the exterior wall shall be such that the graphics are securely attached.
3. The graphics shall not interfere with the active or passive ventilation required for the building and the required smoke control systems in the building.
4. The graphics shall not impair the functions of any fire or life safety systems in the building.

## SECTION 706 FIRE WALLS

**706.1 General.** Each portion of a building separated by one or more fire walls that comply with the provisions of this section shall be considered a separate building. The extent and location of such fire walls shall provide a complete separation. Where a fire wall also separates occupancies that are required to be separated by a fire barrier wall, the most restrictive requirements of each separation shall apply.

**706.1.1 Party walls.** Any wall located on a lot line between adjacent buildings, which is used or adapted for joint service between the two buildings, shall be constructed as a fire wall in accordance with Section 706. Party walls shall be constructed without openings and shall create separate buildings.

**Exception:** Openings in a party wall separating an anchor building and a mall shall be in accordance with Section 402.7.3.1.

**706.2 Structural stability.** Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required fire-resistance rating or shall be constructed as double fire walls in accordance with NFPA 221.

**706.3 Materials.** Fire walls shall be of any approved non-combustible materials.

**Exception:** Buildings of Type V construction.

**706.4 Fire-resistance rating.** Fire walls shall have a fire-resistance rating of not less than that required by Table 706.4.

**TABLE 706.4**  
**FIRE WALL FIRE-RESISTANCE RATINGS**

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, R-2.1, U, L	3 <sup>a</sup>
F-1, H-3 <sup>b</sup> , H-5, M, S-1	3
H-1, H-2	4 <sup>b</sup>
F-2, S-2, R-3, R-4	2

a. In Type II or V construction, walls shall be permitted to have a 2 hour fire resistance rating.

b. For Group H 1, H 2 or H 3 buildings, also see Sections 415.6 and 415.7.

**706.5 Horizontal continuity.** Fire walls shall be continuous from exterior wall to exterior wall and shall extend at least 18 inches (457 mm) beyond the exterior surface of exterior walls.

**Exceptions:**

1. Fire walls shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided the exterior wall has a fire-resistance rating of at least 1 hour for a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour.
2. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided the sheathing, siding, or other exterior noncombustible finish extends a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall.
3. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the fire wall is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

**706.5.1 Exterior walls.** Where the fire wall intersects exterior walls, the fire-resistance rating and opening protection of the exterior walls shall comply with one of the following:

1. The exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with  $\frac{3}{4}$ -hour protection where opening protection is required by Section 705.8. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the fire wall to exterior wall. Exterior wall intersections at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.
2. Buildings or spaces on both sides of the intersecting fire wall shall assume to have an imaginary lot line at the fire wall and extending beyond the exterior of the fire wall. The location of the assumed line in relation to the exterior walls and the fire wall shall be such that the exterior wall and opening protection

meet the requirements set forth in Sections 705.5 and 705.8. Such protection is not required for exterior walls terminating at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad).

**706.5.2 Horizontal projecting elements.** Fire walls shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees and similar projections that are within 4 feet (1220 mm) of the fire wall.

**Exceptions:**

1. Horizontal projecting elements without concealed spaces, provided the exterior wall behind and below the projecting element has not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting element on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour.
2. Noncombustible horizontal projecting elements with concealed spaces, provided a minimum 1-hour fire-resistance-rated wall extends through the concealed space. The projecting element shall be separated from the building by a minimum of 1-hour fire-resistance-rated construction for a distance on each side of the fire wall equal to the depth of the projecting element. The wall is not required to extend under the projecting element where the building exterior wall is not less than 1-hour fire-resistance rated for a distance on each side of the fire wall equal to the depth of the projecting element. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour.
3. For combustible horizontal projecting elements with concealed spaces, the fire wall need only extend through the concealed space to the outer edges of the projecting elements. The exterior wall behind and below the projecting element shall be of not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting elements on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire-protection rating of not less than  $\frac{3}{4}$  hour.

**706.6 Vertical continuity.** Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

**Exceptions:**

1. Stepped buildings in accordance with Section 706.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab, provided:
  - 2.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour

- fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
- 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
  - 2.3. Each building shall be provided with not less than a Class B roof covering.
  3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
  4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks, provided:
    - 4.1. There are no openings in the roof within 4 feet (1220 mm) of the fire wall;
    - 4.2. The roof is covered with a minimum Class B roof covering, and
    - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with  $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
  5. In buildings designed in accordance with Section 510.2, fire walls located above the 3-hour horizontal assembly required by Section 510.2, Item 1 shall be permitted to extend from the top of this horizontal assembly.
  6. Buildings with sloped roofs in accordance with Section 706.6.2.

**706.6.1 Stepped buildings.** Where a fire wall serves as an exterior wall for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof level, provided the exterior wall for a height of 15 feet (4572 mm) above the lower roof is not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.

**Exception:** Where the fire wall terminates at the underside of the roof sheathing, deck or slab of the lower roof, provided:

1. The lower roof assembly within 10 feet (3048 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.

2. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the fire wall.

**706.6.2 Buildings with sloped roofs.** Where a fire wall serves as an interior wall for a building, and the roof on one side or both sides of the fire wall slopes toward the fire wall at a slope greater than two units vertical in 12 units horizontal (2:12), the fire wall shall extend to a height equal to the height of the roof located 4 feet (1219 mm) from the fire wall plus 30 inches (762 mm). In no case shall the extension of the fire wall be less than 30 inches (762 mm).

**706.7 Combustible framing in fire walls.** Adjacent combustible members entering into a concrete or masonry fire wall from opposite sides shall not have less than a 4-inch (102 mm) distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches (102 mm) above, below and between the structural members, with non-combustible materials approved for fireblocking.

**706.8 Openings.** Each opening through a fire wall shall be protected in accordance with Section 716.5 and shall not exceed 156 square feet ( $15\text{ m}^2$ ). The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall.

#### Exceptions:

1. Openings are not permitted in party walls constructed in accordance with Section 706.1.1.
2. Openings shall not be limited to 156 square feet ( $15\text{ m}^2$ ) where both buildings are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

**706.9 Penetrations.** Penetrations of fire walls shall comply with Section 714.

**706.10 Joints.** Joints made in or between fire walls shall comply with Section 715.

**706.11 Ducts and air transfer openings.** Ducts and air transfer openings shall not penetrate fire walls.

**Exception:** Penetrations by ducts and air transfer openings of fire walls that are not on a lot line shall be allowed provided the penetrations comply with Section 717. The size and aggregate width of all openings shall not exceed the limitations of Section 706.8.

## SECTION 707 FIRE BARRIERS

**707.1 General.** Fire barriers installed as required elsewhere in this code or the *California Fire Code* shall comply with this section.

**707.2 Materials.** Fire barriers shall be of materials permitted by the building type of construction.

**707.3 Fire-resistance rating.** The fire-resistance rating of fire barriers shall comply with this section.

**707.3.1 Shaft enclosures.** The fire-resistance rating of the fire barrier separating building areas from a shaft shall comply with Section 713.4.

**707.3.2 Interior exit stairway and ramp construction.** The fire-resistance rating of the fire barrier separating building areas from an interior exit stairway or ramp shall comply with Section 1022.1.

**707.3.3 Enclosures for exit access stairways.** The fire-resistance rating of the fire barrier separating building areas from an exit access stairway or ramp shall comply with Section 1009.3.1.2.

**707.3.4 Exit passageway.** The fire-resistance rating of the fire barrier separating building areas from an exit passageway shall comply with Section 1023.3.

**707.3.5 Horizontal exit.** The fire-resistance rating of the separation between building areas connected by a horizontal exit shall comply with Section 1025.1.

**707.3.6 Atriums.** The fire-resistance rating of the fire barrier separating atriums shall comply with Section 404.6.

**707.3.7 Incidental uses.** The fire barrier separating incidental uses from other spaces in the building shall have a fire-resistance rating of not less than that indicated in Table 509.

**707.3.8 Control areas.** Fire barriers separating control areas shall have a fire-resistance rating of not less than that required in Section 414.2.4.

**707.3.9 Separated occupancies.** Where the provisions of Section 508.4 are applicable, the fire barrier separating mixed occupancies shall have a fire-resistance rating of not less than that indicated in Table 508.4 based on the occupancies being separated.

**707.3.10 Fire areas.** The fire barriers or horizontal assemblies, or both, separating a single occupancy into different fire areas shall have a fire-resistance rating of not less than that indicated in Table 707.3.10. The fire barriers or horizontal assemblies, or both, separating fire areas of mixed occupancies shall have a fire-resistance rating of not less than the highest value indicated in Table 707.3.10 for the occupancies under consideration.

**TABLE 707.3.10**  
**FIRE-RESISTANCE RATING REQUIREMENTS FOR FIRE BARRIER ASSEMBLIES OR HORIZONTAL ASSEMBLIES BETWEEN FIRE AREAS**

OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, E, F-2, H-4, H-5, I, L, M, R, S-2	2
U	1

**707.4 Exterior walls.** Where exterior walls serve as a part of a required fire-resistance-rated shaft or stairway or ramp enclosure, or separation, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure or separation requirements shall not apply.

**Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019 for exterior egress balconies, Section 1022.7 for interior exit stairways and ramps and Section 1026.6 for exterior exit stairways and ramp.

**707.5 Continuity.** Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space above a suspended ceiling. Joints and voids at intersections shall comply with Sections 707.8 and 707.9

**707.5.1 Supporting construction.** The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported. Hollow vertical spaces within a fire barrier shall be fire-blocked in accordance with Section 718.2 at every floor level.

**Exceptions:**

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.8.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. Supporting construction for 1-hour fire barriers required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Interior exit stairway and ramp enclosures required by Section 1022.2 and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 713.12.

**707.6 Openings.** Openings in a fire barrier shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet ( $15 \text{ m}^2$ ). Openings in enclosures for exit access stairways and ramps, interior exit stairways and ramps and exit passageways shall also comply with Sections 1022.3 and 1023.5, respectively.

**Exceptions:**

1. Openings shall not be limited to 156 square feet ( $15 \text{ m}^2$ ) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet ( $15 \text{ m}^2$ ) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving enclosures for exit access stairways, exit access ramps, interior exit stairways and interior exit ramps.

3. Openings shall not be limited to 156 square feet ( $15 \text{ m}^2$ ) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTM E 119 or UL 263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet ( $15 \text{ m}^2$ ) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier separating an enclosures for exit access stairways, exit access ramps, interior exit stairways and interior exit ramps from an exit passageway in accordance with Section 1022.2.1.

**707.7 Penetrations.** Penetrations of fire barriers shall comply with Section 714.

**707.7.1 Prohibited penetrations.** Penetrations into enclosures for exit access stairways, exit access ramps, interior exit stairways, interior exit ramps or an exit passageway shall be allowed only when permitted by Section 1009.3.1.5, 1022.5 or 1023.6, respectively.

**707.8 Joints.** Joints made in or between fire barriers, and joints made at the intersection of fire barriers with underside of a fire-resistance rated floor or roof sheathing, slab, or deck above, and the exterior vertical wall intersection shall comply with Section 715.

**707.9 Voids at intersections.** The voids created at the intersection of a fire barrier and a non-fire-resistance-rated roof assembly shall be filled. An approved material or system shall be used to fill the void, shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

**707.10 Ducts and air transfer openings.** Penetrations in a fire barrier by ducts and air transfer openings shall comply with Section 717.

## SECTION 708 FIRE PARTITIONS

**708.1 General.** The following wall assemblies shall comply with this section.

1. Walls separating dwelling units in the same building as required by Section 420.2.
2. Walls separating sleeping units in the same building as required by Section 420.2.
3. Walls separating tenant spaces in covered and open mall buildings as required by Section 402.4.2.1.
4. Corridor walls as required by Section 1018.1.
5. Elevator lobby separation as required by Section 713.14.1.

6. Walls separating enclosed tenant spaces in high-rise buildings and in buildings of Types I, IIA, IIIA, IV or VA construction of Group A, E, H, I, L and R-2.1 occupancies and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal.

**708.2 Materials.** The walls shall be of materials permitted by the building type of construction.

**708.3 Fire-resistance rating.** Fire partitions shall have a fire-resistance rating of not less than 1 hour.

**Exceptions:**

1. Corridor walls permitted to have a  $\frac{1}{2}$  hour fire-resistance rating by Table 1018.1.
2. Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than  $\frac{1}{2}$  hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. Walls separating enclosed tenant spaces in Group B high-rise buildings of Type I and II construction equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**708.4 Continuity.** Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. In combustible construction where the fire partitions are not required to be continuous to the sheathing, deck or slab, the space between the ceiling and the sheathing, deck or slab above shall be fire-blocked or draftstopped in accordance with Sections 718.2 and 718.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered and open mall buildings, walls separating dwelling units, walls separating sleeping units and corridor walls, in buildings of Type IIB, IIIB and VB construction.

**Exceptions:**

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partitions separating tenant spaces in a covered or open mall building, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resis-

tance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.

5. Attic fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet ( $279\text{ m}^2$ ) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in *all* combustible floor/ceiling and roof/ceiling spaces.

**708.5 Exterior walls.** Where exterior walls serve as a part of a required fire-resistance-rated separation, such walls shall comply with the requirements of Section 705 for exterior walls, and the fire-resistance-rated separation requirements shall not apply.

**Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section 1022.7 for interior exit stairways and ramps and Section 102.6.6 for exterior exit stairways and ramps.

**708.6 Openings.** Openings in a fire partition shall be protected in accordance with Section 716.

**708.7 Penetrations.** Penetrations of fire partitions shall comply with Section 714.

**708.8 Joints.** Joints made in or between fire partitions shall comply with Section 715.

**708.9 Ducts and air transfer openings.** Penetrations in a fire partition by ducts and air transfer openings shall comply with Section 717.

## SECTION 709 SMOKE BARRIERS

**709.1 General.** Smoke barriers shall comply with this section.

**709.2 Materials.** Smoke barriers shall be of materials permitted by the building type of construction.

**709.3 Fire-resistance rating.** A 1-hour fire-resistance rating is required for smoke barriers.

**Exception:** Smoke barriers constructed of minimum 0.10-inch-thick (2.5 mm) steel in Group I-3 buildings.

**709.4 Continuity.** Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

### Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 are not required to extend from outside wall to outside wall.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 are not required to extend from outside wall to outside wall.

**709.5 Openings.** Openings in a smoke barrier shall be protected in accordance with Section 716.

### Exceptions:

1. In Group I-2, I-2.1 and ambulatory care facilities, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of  $\frac{3}{4}$ -inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 716.

**709.6 Penetrations.** Penetrations of smoke barriers shall comply with Section 714.

**709.7 Joints.** Joints made in or between smoke barriers shall comply with Section 715.

**709.8 Ducts and air transfer openings.** Penetrations in a smoke barrier by ducts and air transfer openings shall comply with Section 717.

## SECTION 710 SMOKE PARTITIONS

**710.1 General.** Smoke partitions installed as required elsewhere in the code shall comply with this section.

**710.2 Materials.** The walls shall be of materials permitted by the building type of construction. *In Group I-2 and I-2.1, smoke partitions shall have framing covered with noncombustible materials having an approved thermal barrier with an index of not less than 15 in accordance with FM 4880, UL 1040, NFPA 286 or UL 1715.*

**710.3 Fire-resistance rating.** Unless required elsewhere in the code, smoke partitions are not required to have a fire-resistance rating.

**710.4 Continuity.** Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

**710.5 Openings.** Openings in smoke partitions shall comply with Sections 710.5.1 and 710.5.2.

**710.5.1 Windows.** Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke.

**710.5.2 Doors.** Doors in smoke partitions shall comply with Sections 710.5.2.1 through 710.5.2.3.

**710.5.2.1 Louvers.** Doors in smoke partitions shall not include louvers.

**710.5.2.2 Smoke and draft control doors.** Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot ( $0.015424 \text{ m}^3/(\text{s} \cdot \text{m}^2)$ ) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

**710.5.2.3 Self- or automatic-closing doors.** Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**710.6 Penetrations.** The space around penetrating items shall be filled with an approved material to limit the free passage of smoke.

**710.7 Joints.** Joints shall be filled with an approved material to limit the free passage of smoke.

**710.8 Ducts and air transfer openings.** The space around a duct penetrating a smoke partition shall be filled with an *approved* material to limit the free passage of smoke. Air transfer openings in smoke partitions shall be provided with a *smoke damper* complying with Section 717.3.2.2. *For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, duct openings in smoke partitions shall also be provided with a smoke damper complying with Section 717.3.2.2.*

**Exception:**

1. Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternative protection shall be utilized.
2. *[SFM] Smoke dampers are not required in corridor penetrations where the duct is constructed of steel*

*not less than 0.019-inch (0.40 mm) in thickness and there are no openings serving the corridor.*

## SECTION 711 HORIZONTAL ASSEMBLIES

**711.1 General.** Floor and roof assemblies required to have a fire-resistance rating shall comply with this section. Nonfire-resistance-rated floor and roof assemblies shall comply with Section 714.4.2.

**711.2 Materials.** The floor and roof assemblies shall be of materials permitted by the building type of construction.

**711.3 Fire-resistance rating.** The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.4 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 707.3.10. Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.

**Exception:** Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than  $\frac{1}{2}$  hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**711.3.1 Ceiling panels.** Where the weight of lay-in ceiling panels, used as part of fire-resistance-rated floor/ceiling or roof/ceiling assemblies, is not adequate to resist an upward force of 1 pound per square foot (48 Pa), wire or other approved devices shall be installed above the panels to prevent vertical displacement under such upward force.

**711.3.2 Access doors.** Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies provided such doors are tested in accordance with ASTM E 119 or UL 263 as horizontal assemblies and labeled by an approved agency for such purpose.

**711.3.3 Unusable space.** In 1-hour fire-resistance-rated floor assemblies, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof assemblies, the floor membrane is not required to be installed where unusable attic space occurs above.

**711.4 Continuity.** Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 712.1, 714.4, 715, 1009.3 and 1022.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance

rated in accordance with Section 705.8.6. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

**Exception:** In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 509, provided the required fire-resistance rating does not exceed 1 hour.
2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 420.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

**711.4.1 Nonfire-resistance-rated assemblies.** Joints in or between floor assemblies without a required fire-resistance rating shall comply with one of the following:

1. The joint shall be concealed within the cavity of a wall.
2. The joint shall be located above a ceiling.
3. The joint shall be sealed, treated or covered with an approved material or system to resist the free passage of flame and the products of combustion.

**Exception:** Joints meeting one of the joint exceptions listed in Section 715.1.

**711.5 Penetrations.** Penetrations of horizontal assemblies, whether concealed or unconcealed, shall comply with Section 714.

**711.6 Joints.** Joints made in or between horizontal assemblies shall comply with Section 715. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 715.4.

**711.7 Ducts and air transfer openings.** Penetrations in horizontal assemblies by ducts and air transfer openings shall comply with Section 717.

**711.8 Floor fire door assemblies.** Floor fire door assemblies used to protect openings in fire-resistance-rated floors shall be tested in accordance with NFPA 288, and shall achieve a fire-resistance rating not less than the assembly being penetrated. Floor fire door assemblies shall be labeled by an approved agency. The label shall be permanently affixed and shall specify the manufacturer, the test standard and the fire-resistance rating.

**711.9 Smoke barrier.** Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition of smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 714.5 and 715.6. Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 713.14.1. Openings through horizontal assem-

blies shall be protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.

## SECTION 712 VERTICAL OPENINGS

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**712.1 General.** The provisions of this section shall apply to the vertical opening applications listed in Sections 712.1.1 through 712.1.18.

**712.1.1 Shaft enclosures.** Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted.

**712.1.2 Individual dwelling unit.** Unconcealed vertical openings totally within an individual residential dwelling unit and connecting four stories or less shall be permitted.

**712.1.3 Escalator openings.** *In other than Groups I-2, I-2.1 and I-3,* where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, an escalator opening shall be protected according to Section 712.1.3.1 or 712.1.3.2.

**712.1.3.1 Opening size.** Protection by a draft curtain and closely spaced sprinklers in accordance with NFPA 13 shall be permitted where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the escalator. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

**712.1.3.2 Automatic shutters.** Protection of the opening by approved shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.

**712.1.4 Penetrations.** Penetrations shall be protected in accordance with Section 714.

**712.1.5 Ducts.** Penetrations by ducts shall be protected in accordance with Section 717.6. Grease ducts shall be protected in accordance with the *California Mechanical Code*.

**712.1.6 Atriums.** In other than Group H occupancies, atriums complying with Section 404 shall be permitted.

**712.1.7 Masonry chimney.** Approved masonry chimneys shall be permitted where the annular space is fireblocked at each floor level in accordance with Section 718.2.5.

**712.1.8 Two-story openings.** In other than Groups I-2, I-2.1 and I-3, a floor opening that is not used as one of the

applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

**712.1.9 Parking garages.** Automobile ramps in open and enclosed parking garages shall be permitted where constructed in accordance with Sections 406.5 and 406.6, respectively.

**712.1.10 Mezzanine.** Vertical openings between a mezzanine complying with Section 505 and the floor below shall be permitted.

**712.1.11 Joints.** Joints shall be permitted where complying with Section 715.

**712.1.12 Unenclosed stairs and ramps.** Vertical floor openings created by unenclosed stairs or ramps in accordance with Sections 1009.2 and 1009.3 shall be permitted.

**712.1.13 Floor fire doors.** Vertical openings shall be permitted where protected by floor fire doors in accordance with Section 711.8.

**712.1.14. Group I-3.** In Group I-3 occupancies, vertical openings shall be permitted in accordance with Section 408.5.

**712.1.15 Elevators in parking garages.** Vertical openings for elevator hoistways in open or enclosed parking garages that serve only the parking garage, and complying with Sections 406.5 and 406.6 respectively, shall be permitted.

**712.1.16 Duct systems in parking garages.** Vertical openings for mechanical exhaust or supply duct systems in open or enclosed parking garages complying with Sections 406.5 and 406.6 respectively, shall be permitted to be unenclosed where such duct system is contained within and serves only the parking garage.

**712.1.17 Nonfire-resistance-rated joints.** Joints in or between floors without a required fire-resistance rating shall be permitted in accordance with Section 711.4.1.

**712.1.18 Openings otherwise permitted.** Vertical openings shall be permitted where allowed by other sections of this code.

## SECTION 713 SHAFT ENCLOSURES

**713.1 General.** The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and exit access ramps shall be protected in accordance with the applicable provisions of Section 1009. Interior exit stairways and interior exit ramps shall be protected in accordance with the requirements of Section 1022.

**713.2 Construction.** Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.

**713.3 Materials.** The shaft enclosure shall be of materials permitted by the building type of construction.

**713.4 Fire-resistance rating.** Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.

**713.5 Continuity.** Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, and shall have continuity in accordance with Section 707.5 for fire barriers or Section 711.4 for horizontal assemblies as applicable.

**713.6 Exterior walls.** Where exterior walls serve as a part of a required shaft enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

**Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section 1022.7 for interior exit stairways and ramps and Section 1026.6 for exterior exit stairways and ramps.

**713.7 Openings.** Openings in a shaft enclosure shall be protected in accordance with Section 716 as required for fire barriers. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**713.7.1 Prohibited openings.** Openings other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

**713.8 Penetrations.** Penetrations in a shaft enclosure shall be protected in accordance with Section 714 as required for fire barriers. Structural elements, such as beams or joists, where protected in accordance with Section 714 shall be permitted to penetrate a shaft enclosure.

**713.8.1 Prohibited penetrations.** Penetrations other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

**713.9 Joints.** Joints in a shaft enclosure shall comply with Section 715.

**713.10 Duct and air transfer openings.** Penetrations of a shaft enclosure by ducts and air transfer openings shall comply with Section 717.

**713.11 Enclosure at the bottom.** Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:

1. They shall be enclosed at the lowest level with construction of the same fire-resistance rating as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure.
2. They shall terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating and opening protectives shall be at least equal to the protection required for the shaft enclosure.
3. They shall be protected by approved fire dampers installed in accordance with their listing at the lowest floor level within the shaft enclosure.

**Exceptions:**

1. The fire-resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom of the shaft shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for draftstopping, or the room shall be provided with an approved automatic sprinkler system.
2. A shaft enclosure containing a refuse chute or laundry chute shall not be used for any other purpose and shall terminate in a room protected in accordance with Section 713.13.4.
3. The fire-resistance-rated room separation and the protection at the bottom of the shaft are not required provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.

**713.12 Enclosure at top.** A shaft enclosure that does not extend to the underside of the roof sheathing, deck or slab of the building shall be enclosed at the top with construction of the same fire-resistance rating as the topmost floor penetrated by the shaft, but not less than the fire-resistance rating required for the shaft enclosure.

**713.13 Refuse and laundry chutes.** In other than Group I-2 and I-2.1, refuse and laundry chutes, access and termination rooms and incinerator rooms shall meet the requirements of Sections 713.13.1 through 713.13.6.

**Exceptions:**

1. Chutes serving and contained within a single dwelling unit.
2. Refuse and laundry chutes in Group I-2 and I-2.1 shall comply with the provisions of NFPA 82, Chapter 5.

**713.13.1 Refuse, recycling and laundry chute enclosures.** A shaft enclosure containing a refuse, recycling, or laundry chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. Openings into the shaft, including those from access rooms and termination rooms, shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in corridors. Doors shall be self- or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.5.9.3, except that heat-activated closing devices shall be permitted between the shaft and the termination room.

**713.13.2 Materials.** A shaft enclosure containing a refuse, recycling, or laundry chute shall be constructed of materials as permitted by the building type of construction.

**713.13.3 Refuse, recycling and laundry chute access rooms.** Access openings for refuse, recycling and laundry chutes shall be located in rooms or compartments enclosed by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings into the access rooms shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.5.9.3.

**713.13.4 Termination room.** Refuse, recycling, and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings into the termination room shall be protected by opening protectives having a fire protection rating equal to the protection required for the shaft enclosure. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.5.9.3. Refuse chutes shall not terminate in an incinerator room. Refuse, recycling and laundry rooms that are not provided with chutes need only comply with Table 509.

**713.13.5 Incinerator room.** Incinerator rooms shall comply with Table 509.

**713.13.6 Automatic sprinkler system.** An approved automatic sprinkler system shall be installed in accordance with Section 903.2.11.2.

**713.14 Elevator, dumbwaiter and other hoistways.** Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 713 and Chapter 30.

**713.14.1 Elevator lobby.** An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than two stories in Group A, E, H, I, L, R-1, R-2 and R-2.1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, and more than three stories for all other occupancies. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls

shall also comply with Section 716.5.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 717.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

**Exceptions:**

1. Enclosed elevator lobbies are not required at the level(s) of exit discharge, provided the level(s) of exit discharge is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 712.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
  - 4.1. *Group A occupancies;*
  - 4.2. *Group E occupancies;*
  - 4.3. *Group H occupancies;*
  - 4.4. *Group I occupancies;*
  - 4.5. *Group L occupancies;*
  - 4.6. *Group R-1, R-2, and R-2.1 occupancies; and*
  - 4.7. *High-rise buildings.*
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 717.5.4.1.
6. *[SFM] When approved, in other than Group I-2 occupancies* enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.5.

8. *[SFM] Enclosed elevator lobbies are not required where the hoistway door has a fire-protection rating as required by Section 708.7 and the hoistway door opening is also protected by a listed and labeled smoke containment system complying with ICC ES AC 77.*

*See Section 403.6 for additional requirements for highrise buildings.*

**713.14.1.1 Areas of refuge.** Areas of refuge shall be provided as required in Section 1007.

## SECTION 714 PENETRATIONS

**714.1 Scope.** The provisions of this section shall govern the materials and methods of construction used to protect through penetrations and membrane penetrations of horizontal assemblies and fire-resistance-rated wall assemblies.

**714.1.1 Ducts and air transfer openings.** Penetrations of fire-resistance-rated walls by ducts that are not protected with dampers shall comply with Sections 714.2 through 714.3.3. Penetrations of horizontal assemblies not protected with a shaft as permitted by Section 717.6, and not required to be protected with fire dampers by other sections of this code, shall comply with Sections 714.4 through 714.4.2.2. Ducts and air transfer openings that are protected with dampers shall comply with Section 717.

**714.2 Installation details.** Where sleeves are used, they shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

**714.3 Fire-resistance-rated walls.** Penetrations into or through fire walls, fire barriers, smoke barrier walls and fire partitions shall comply with Sections 714.3.1 through 714.3.3. Penetrations in smoke barrier walls shall also comply with Section 714.5.

**714.3.1 Through penetrations.** Through penetrations of fire-resistance-rated walls shall comply with Section 714.3.1.1 or 714.3.1.2.

**Exception:** Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space between the penetrating item and the fire-resistance-rated wall is permitted to be protected as follows:

1. In concrete or masonry walls where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m<sup>2</sup>), concrete, grout or mortar is permitted where it is installed the full thickness of the wall or the thickness required to maintain the fire-resistance rating; or

2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

**714.3.1.1 Fire-resistance-rated assemblies.** Penetrations shall be installed as tested in an approved fire-resistance-rated assembly.

**714.3.1.2 Through-penetration firestop system.** Through penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water and shall have an F rating of not less than the required fire-resistance rating of the wall penetrated.

**714.3.2 Membrane penetrations.** Membrane penetrations shall comply with Section 714.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire-resistance will not be reduced.

**Exceptions:**

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches ( $0.0103 \text{ m}^2$ ) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches ( $0.0645 \text{ m}^2$ ) in any 100 square feet ( $9.29 \text{ m}^2$ ) of wall area. The annular space between the wall membrane and the box shall not exceed  $\frac{1}{8}$  inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

- 1.1. By a horizontal distance of not less than 24 inches (610 mm) where the wall or partition is constructed with individual noncommunicating stud cavities;
- 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
- 1.3. By solid fireblocking in accordance with Section 718.2.1;
- 1.4. By protecting both outlet boxes with listed putty pads; or
- 1.5. By other listed materials and methods.

2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not

exceed  $\frac{1}{8}$  inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

- 2.1. By the horizontal distance specified in the listing of the electrical boxes;
- 2.2. By solid fireblocking in accordance with Section 718.2.1;
- 2.3. By protecting both boxes with listed putty pads; or
- 2.4. By other listed materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes, provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.
5. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

**714.3.3 Dissimilar materials.** Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the wall is maintained.

**714.4 Horizontal assemblies.** Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 712.1 shall be protected in accordance with Sections 714.4.1 through 714.4.2.2.

**714.4.1 Fire-resistance-rated assemblies.** Penetrations of the fire-resistance-rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections 714.4.1.1 through 714.4.1.4. Penetrations in horizontal smoke barriers shall also comply with 714.5.

**714.4.1.1 Through penetrations.** Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 714.4.1.1.1 or 714.4.1.1.2.

**Exceptions:**

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to

ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches ( $92\ 900\ mm^2$ ) in any 100 square feet ( $9.3\ m^2$ ) of floor area.

2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating. The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches ( $92\ 900\ mm^2$ ).
3. Penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

**714.4.1.1.1 Installation.** Through penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

**714.4.1.1.2 Through-penetration firestop system.** Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

#### Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.

**714.4.1.2 Membrane penetrations.** Penetrations of membranes that are part of a horizontal assembly shall comply with Section 714.4.1.1 or 714.4.1.1.2. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed

such that the required fire resistance will not be reduced.

#### Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 714.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches ( $64\ 500\ mm^2$ ) in any 100 square feet ( $9.3\ m^2$ ) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour horizontal assemblies by steel electrical boxes that do not exceed 16 square inches ( $10\ 323\ mm^2$ ) in area, provided the aggregate area of such penetrations does not exceed 100 square inches ( $44\ 500\ mm^2$ ) in any 100 square feet ( $9.29\ m^2$ ) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed  $\frac{1}{8}$  inch (3.2 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an opening protective material system for use in horizontal assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed  $\frac{1}{8}$  inch (3.2 mm) unless listed otherwise.
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal escutcheon plate.
6. Noncombustible items that are cast into concrete building elements and that do not penetrate both top and bottom surfaces of the element.
7. The ceiling membrane of 1- and 2-hour fire-resistance-rated horizontal assemblies is permitted to be interrupted with the double wood top plate of a fire-resistance-rated wall assembly, provided that all penetrating items through the double top plates are protected in accordance with Section 714.4.1.1 or 714.4.1.1.2. The fire-resistance rating of the wall shall not be less than the rating of the horizontal assembly.

**714.4.1.3 Dissimilar materials.** Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the horizontal assembly is maintained.

**714.4.2 Nonfire-resistance-rated assemblies.** Penetrations of nonfire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance-rated roof/ceiling assembly shall meet the requirements of Section 713 or shall comply with Section 714.4.2.1 or 714.4.2.2.

**714.4.2.1 Noncombustible penetrating items.** Noncombustible penetrating items that connect not more than five stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

**714.4.2.2 Penetrating items.** Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.

**714.5 Penetrations in smoke barriers.** Penetrations in smoke barriers shall be protected by an approved through-penetration firestop system installed and tested in accordance with the requirements of UL 1479 for air leakage. The L rating of the system measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:

1. 5.0 cfm per square foot ( $0.025\text{m}^3/\text{s} \cdot \text{m}^2$ ) of penetration opening for each through-penetration firestop system; or
2. A total cumulative leakage of 50 cfm ( $0.024\text{m}^3/\text{s}$ ) for any 100 square feet ( $9.3\text{ m}^2$ ) of wall area, or floor area.

## SECTION 715 FIRE-RESISTANT JOINT SYSTEMS

**715.1 General.** Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 715.3.

**Exception:** Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 713.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.

4. Floors within malls.
5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.5 and 406.6, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

**715.1.1 Curtain wall assembly.** The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 715.4.

**715.2 Installation.** A fire-resistant joint system shall be securely installed in accordance with the listing criteria in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

**715.3 Fire test criteria.** Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E 1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.

**Exception:** For exterior walls with a horizontal fire separation distance greater than 5 feet (1524 mm), the joint system shall be required to be tested for interior fire exposure only.

**715.4 Exterior curtain wall/floor intersection.** Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an F rating for a time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

**Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the

time period at least equal to the fire-resistance rating of the floor assembly.

**715.4.1 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections.** Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to retard the interior spread of fire and hot gases between stories.

**715.5 Spandrel wall.** Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require a fire-resistance-rated spandrel wall, the requirements of Section 715.4 shall still apply to the intersection between the spandrel wall and the floor.

**715.6 Fire-resistant joint systems in smoke barriers.** Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal smoke barrier and an exterior curtainwall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The *L* rating of the joint system shall not exceed 5 cfm per linear foot ( $0.00775 \text{ m}^3/\text{s m}$ ) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

## SECTION 716 OPENING PROTECTIVES

**716.1 General.** Opening protectives required by other sections of this code shall comply with the provisions of this section.

**716.2 Fire-resistance-rated glazing.** Fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 or UL 263 and labeled in accordance with Section 703.5 shall be permitted in fire doors and fire window assemblies where tested and installed in accordance with their listings and shall not otherwise be required to comply with this section.

**716.3 Marking fire-rated glazing assemblies.** Fire-rated glazing assemblies shall be marked in accordance with Tables 716.3, 716.5, and 716.6.

**716.3.1 Fire-rated glazing that exceeds the code requirements.** Fire-rated glazing assemblies marked as

complying with hose stream requirements (H) shall be permitted in applications that do not require compliance with hose stream requirements. Fire-rated glazing assemblies marked as complying with temperature rise requirements (T) shall be permitted in applications that do not require compliance with temperature rise requirements. Fire-rated glazing assemblies marked with ratings (XXX) that exceed the ratings required by this code shall be permitted.

**716.4 Alternative methods for determining fire protection ratings.** The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257 or UL 9. The required fire resistance of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in approved sources.
2. Calculations performed in an approved manner.
3. Engineering analysis based on a comparison of opening protective designs having fire protection ratings as determined by the test procedures set forth in NFPA 252, NFPA 257 or UL 9.
4. Alternative protection methods as allowed by Section 104.11.

**716.5 Fire door and shutter assemblies.** Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 716.5.1, 716.5.2 or 716.5.3 and the fire protection rating indicated in Table 716.5. Fire door frames with transom lights, sidelights or both shall be permitted in accordance with Section 716.5.6. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

### Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad fire door assemblies.
2. Floor fire door assemblies in accordance with Section 711.8.

TABLE 716.3  
MARKING FIRE-RATED GLAZING ASSEMBLIES

FIRE TEST STANDARD	MARKING	DEFINITION OF MARKING
ASTM E 119 or UL 263	W	Meets wall assembly criteria.
NFPA 257 or UL 9	OH	Meets fire window assembly criteria including the hose stream test.
NFPA 252 or UL 10B or UL 10C	D H T	Meets fire door assembly criteria. Meets fire door assembly "Hose Stream" test. Meets 450°F temperature rise criteria for 30 minutes
	XXX	The time in minutes of the fire resistance or fire protection rating of the glazing assembly

For SI: °C = [(°F) - 32]/1.8.

**716.5.1 Side-hinged or pivoted swinging doors.** Fire door assemblies with side-hinged and pivoted swinging doors shall be tested in accordance with NFPA 252 or UL 10C. After 5 minutes into the NFPA 252 test, the neutral pressure level in the furnace shall be established at 40 inches (1016 mm) or less above the sill.

**716.5.2 Other types of assemblies.** Fire door assemblies with other types of doors, including swinging elevator doors and fire shutter assemblies, bottom and side-hinged chute intake doors, and top-hinged chute discharge doors, shall be tested in accordance with NFPA 252 or UL 10B. The pressure in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period.

**716.5.3 Door assemblies in corridors and smoke barriers.** Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke barrier walls having a fire-resistance rating in accordance with Table 716.5 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

**Exceptions:**

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has at least one-half of its required exit or exit access doorways opening directly to the exterior or into an exit passageway.
4. Horizontal sliding doors in smoke barriers that comply with Sections 408.3 and 408.8.1 in occupancies in Group I-3.
5. *Cell or room doors, including cell or room doors with integral side-lites that are part of the door assembly in Group I-3 occupancies which open into a required exit corridor within a cell complex.*

**716.5.3.1 Smoke and draft control.** Fire door assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot ( $0.01524 \text{ m}^3/\text{s} \cdot \text{m}^2$ ) of door opening at 0.10 inch

(24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

**716.5.3.2 Glazing in door assemblies.** In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection-rated glazing of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lights and sidelights, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 716.6.

**716.5.4 Door assemblies in other fire partitions.** Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in other fire partitions having a fire-resistance rating of 0.5 hour in accordance with Table 716.5 shall be tested in accordance with NFPA 252, UL 10B or UL 10C with the hose stream test.

**716.5.5 Doors in interior exit stairways and ramps and exit passageways.** Fire door assemblies in interior exit stairways and ramps and exit passageways shall have a maximum transmitted temperature rise of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

**Exception:** The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

**716.5.5.1 Glazing in doors.** Fire-protection-rated glazing in excess of 100 square inches ( $0.065 \text{ m}^2$ ) is not permitted. Fire-resistance-rated glazing in excess of 100 square inches ( $0.065 \text{ m}^2$ ) shall be permitted in fire door assemblies when tested as components of the door assemblies, and not as glass lights, and shall have a maximum transmitted temperature rise of 450°F (250°C) in accordance with Section 716.5.5.

**716.5.6 Fire door frames with transom lights and sidelights.** Door frames with transom lights, sidelights, or both, shall be permitted where a  $\frac{3}{4}$ -hour fire protection rating or less is required in accordance with Table 716.5. Fire door frames with transom lights, sidelights, or both, installed with fire-resistance-rated glazing tested as an assembly in accordance with ASTM E 119 or UL 263 shall be permitted where a fire protection rating exceeding  $\frac{3}{4}$  hour is required in accordance with Table 716.5.

**716.5.7 Labeled protective assemblies.** Fire door assemblies shall be labeled by an approved agency. The labels shall comply with NFPA 80, and shall be permanently affixed to the door or frame.

**FIRE AND SMOKE PROTECTION FEATURES**

**TABLE 716.5  
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL <sup>a</sup>	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	Not Permitted	Not Permitted	Not Permitted	4	Not Permitted	W-240
	3	3 <sup>a</sup>	Not Permitted	Not Permitted	Not Permitted	3	Not Permitted	W-180
	2	1½	100 sq. in. <sup>c</sup>	≤100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1½	1½	100 sq. in. <sup>c</sup>	≤100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	1½	Not Permitted	W-90
Shaft, exit enclosures and exit passageway walls	2	1½	100 sq. in. <sup>c,d</sup>	≤100 sq.in. = D-H-90 > 100 sq.in.= D-H-T-or D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1	100 sq. in. <sup>c,d</sup>	≤100 sq.in. = D-H-60 >100 sq.in.= D-H-T-60 or D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					<b>Fire protection</b>			
Other fire barriers	1	¾	Maximum size tested	D-H-NT-45	¾		D-H-NT-45	
Fire partitions: Corridor walls	1	1/3 <sup>b</sup>	Maximum size tested	D-20	¾		D-H-OH-45	
	0.5	1/3 <sup>b</sup>	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1	¾	Maximum size tested	D-H-45	¾		D-H-45	
	0.5	1/3 <sup>b</sup>	Maximum size tested	D-H-20	1/3		D-H-20	

(continued)

**TABLE 716.5—continued**  
**OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL *	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Exterior walls	3	1½	100 sq. in. <sup>c</sup>	≤100 sq.in. = D-H-90 >100 sq.in = D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	1½	100 sq. in. <sup>c</sup>	≤100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1	¾	Maximum size tested	D-H-45	¾		D-H-45	
Smoke barriers	1	⅓ <sup>b</sup>	Maximum size tested	D-20	¾		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

- a. Two doors, each with a fire protection rating of 1½ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3 hour fire door.
- b. For testing requirements, see Section 716.6.3.
- c. Fire resistance rated glazing tested to ASTM E 119 in accordance with Section 716.2 shall be permitted, in the maximum size tested.
- d. Except where the building is equipped throughout with an automatic sprinkler and the fire rated glazing meets the criteria established in Section 716.5.5.
- e. Under the column heading "Fire rated glazing marking door vision panel," W refers to the fire resistance rating of the glazing, not the frame.

**716.5.7.1 Fire door labeling requirements.** Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in interior exit stairways and ramps and exit passageways by Section 716.5.5, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 716.5.7.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

**Exception:** In Group I-3 doors that are required to be 45 minutes or higher shall be fire-rated assemblies or certified by the manufacturer as being equivalent to the required standard.

**716.5.7.1.1 Light kits, louvers and components.** Listed light kits and louvers and their required preparations shall be considered as part of the labeled door where such installations are done under the listing program of the third-party agency. Where tested for such use, fire doors and door assemblies shall be permitted to consist of components, including glazing, vision light kits and hardware that are labeled, listed or classified by different third-party agencies.

**716.5.7.2 Oversized doors.** Oversized fire doors shall bear an oversized fire door label by an approved agency or shall be provided with a certificate of inspection furnished by an approved testing agency. When a certificate of inspection is furnished by an approved testing agency, the certificate shall state that the door conforms

to the requirements of design, materials and construction, but has not been subjected to the fire test.

**716.5.7.3 Smoke and draft control door labeling requirements.** Smoke and draft control doors complying with UL 1784 shall be labeled in accordance with Section 716.5.6.1 and shall show the letter "S" on the fire-rating label of the door. This marking shall indicate that the door and frame assembly are in compliance when listed or labeled gasketing is also installed.

**716.5.7.4 Fire door frame labeling requirements.** Fire door frames shall be labeled showing the names of the manufacturer and the third-party inspection agency.

**716.5.8 Glazing material.** Fire-protection-rated glazing conforming to the opening protection requirements in Section 716.5 shall be permitted in fire door assemblies.

**716.5.8.1 Size limitations.** Fire-protection-rated glazing shall comply with the size limitations of NFPA 80, and as provided in Sections 716.5.8.1.1 and 716.5.8.1.2.

**716.5.8.1.1 Fire-resistance-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1 hour.** Fire-resistance-rated glazing tested to ASTM E 119 or UL 263 and NFPA 252, UL 10B or UL 10C shall be permitted in fire door assemblies located in fire walls and in fire barriers in accordance with Table 716.5 to the maximum size tested and in accordance with their listings.

**716.5.8.1.2 Fire-protection-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1 hour.** Fire-protection-rated glazing shall be prohibited in fire walls and fire barriers

except as provided in Sections 716.5.8.1.2.1 and 716.5.8.1.2.2.

**716.5.8.1.2.1 Horizontal exits.** Fire-protection-rated glazing shall be permitted as vision panels in self-closing swinging fire door assemblies serving as horizontal exits in fire walls where limited to 100 square inches ( $0.065\text{ m}^2$ ) with no dimension exceeding 10 inches (0.3 mm).

**716.5.8.1.2.2 Fire barriers.** Fire-protection-rated glazing shall be permitted in fire doors having a  $1\frac{1}{2}$ -hour fire protection rating intended for installation in fire barriers, where limited to 100 square inches ( $0.065\text{ m}^2$ ).

**716.5.8.2 Elevator, stairway and ramp protectives.** Approved fire-protection-rated glazing used in fire door assemblies in elevator, stairways and ramps enclosures shall be so located as to furnish clear vision of the passageway or approach to the elevator, stairway or ramp.

**716.5.8.3 Labeling.** Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 716.5.8.3.1 that shall be issued by an approved agency and shall be permanently identified on the glazing.

**716.5.8.3.1 Identification.** For fire-protection-rated glazing, the label shall bear the following four-part identification: "D - H or NH - T or NT - XXX." "D" indicates that the glazing shall be used in fire door assemblies and that the glazing meets the fire protection requirements of NFPA 252. "H" shall indicate that the glazing meets the hose stream requirements of NFPA 252. "NH" shall indicate that the glazing does not meet the hose stream requirements of the test. "T" shall indicate that the glazing meets the temperature requirements of Section 716.5.5.1. "NT" shall indicate that the glazing does not meet the temperature requirements of Section 716.5.5.1. The placeholder "XXX" shall specify the fire-protection-rating period, in minutes.

**716.5.8.4 Safety glazing.** Fire-protection-rated glazing installed in fire doors in areas subject to human impact in hazardous locations shall comply with Chapter 24.

**716.5.9 Door closing.** Fire doors shall be self- or automatic-closing in accordance with this section. Self-closing chute intake doors shall not fail in a "door open" position in the event of a closer failure.

#### Exceptions:

1. Fire doors located in common walls separating sleeping units in Group R-1 shall be permitted without automatic- or self-closing devices.
2. The elevator car doors and the associated hoistway enclosure doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.

**716.5.9.1 Latch required.** Unless otherwise specifically permitted, single fire doors and both leaves of pairs of side-hinged swinging fire doors shall be provided with an active latch bolt that will secure the door when it is closed.

**716.5.9.1.1 Chute intake door latching.** Chute intake doors shall be positive latching, remaining latched and closed in the event of latch spring failure during a fire emergency.

**716.5.9.2 Automatic-closing fire door assemblies.** Automatic-closing fire door assemblies shall be self-closing in accordance with NFPA 80.

**716.5.9.3 Smoke-activated doors.** Automatic-closing doors installed in the following locations shall be automatic-closing by the actuation of smoke detectors installed in accordance with Section 907.3 or by loss of power to the smoke detector or hold-open device. Doors that are automatic-closing by smoke detection shall not have more than a 10-second delay before the door starts to close after the smoke detector is actuated:

1. Doors installed across a corridor.
2. Doors that protect openings in exits or corridors required to be of fire-resistance-rated construction.
3. Doors that protect openings in walls that are capable of resisting the passage of smoke in accordance with Section 509.4.
4. Doors installed in smoke barriers in accordance with Section 709.5.
5. Doors installed in fire partitions in accordance with Section 708.6.
6. Doors installed in a fire wall in accordance with Section 706.8.
7. Doors installed in shaft enclosures in accordance with Section 713.7.
8. Doors installed in refuse and laundry chutes and access and termination rooms in accordance with Section 713.13. Automatic-closing chute intake doors installed in refuse and laundry chutes shall also meet the requirements of Sections 716.5.9 and 716.5.9.1.1.
9. Doors installed in the walls for compartmentation of underground buildings in accordance with Section 405.4.2.
10. Doors installed in the elevator lobby walls of underground buildings in accordance with Section 405.4.3.
11. Doors installed in smoke partitions in accordance with Section 710.5.2.3.
12. [SFM] Doors installed in walls required to be fire rated in accordance with Section 509.4.
13. [SFM] Doors installed in walls required to be fire rated in accordance with Section 508.4.

*In Group I-2 and I-2.1 occupancies smoke activated doors installed in the above locations shall be automatic closing by actuation of the fire alarm system, or actuation of smoke detectors installed in accordance with Section 907.3, or activation of the sprinkler system installed in accordance with Section 903.1.*

**716.5.9.4 Doors in pedestrian ways.** Vertical sliding or vertical rolling steel fire doors in openings through which pedestrians travel shall be heat activated or activated by smoke detectors with alarm verification.

**716.5.10 Swinging fire shutters.** Where fire shutters of the swinging type are installed in exterior openings, not less than one row in every three vertical rows shall be arranged to be readily opened from the outside, and shall be identified by distinguishing marks or letters not less than 6 inches (152 mm) high.

**716.5.11 Rolling fire shutters.** Where fire shutters of the rolling type are installed, such shutters shall include approved automatic-closing devices.

**716.6 Fire-protection-rated glazing.** Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 716.6. Glazing in fire door assemblies shall comply with Section 716.5.8. Fire-protection-rated glazing in fire window assemblies shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 705.3, 705.8, 705.8.5 or 705.8.6 shall have a fire protection rating of not less than  $\frac{3}{4}$  hour. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have a 0.33-hour fire protection rating.

**716.6.1 Testing under positive pressure.** NFPA 257 or UL 9 shall evaluate fire-protection-rated glazing under positive pressure. Within the first 10 minutes of a test, the

pressure in the furnace shall be adjusted so at least two-thirds of the test specimen is above the neutral pressure plane, and the neutral pressure plane shall be maintained at that height for the balance of the test.

**716.6.2 Nonsymmetrical glazing systems.** Nonsymmetrical fire-protection-rated glazing systems in fire partitions, fire barriers or in exterior walls with a fire separation distance of 5 feet (1524 mm) or less pursuant to Section 705 shall be tested with both faces exposed to the furnace, and the assigned fire protection rating shall be the shortest duration obtained from the two tests conducted in compliance with NFPA 257 or UL 9.

**716.6.3 Safety glazing.** Fire-protection-rated glazing installed in fire window assemblies in areas subject to human impact in hazardous locations shall comply with Chapter 24.

**716.6.4 Glass and glazing.** Glazing in fire window assemblies shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in NFPA 80.

**716.6.5 Installation.** Fire-protection-rated glazing shall be in the fixed position or be automatic-closing and shall be installed in approved frames.

**716.6.6 Window mullions.** Metal mullions that exceed a nominal height of 12 feet (3658 mm) shall be protected with materials to afford the same fire-resistance rating as required for the wall construction in which the protective is located.

**716.6.7 Interior fire window assemblies.** Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

TABLE 716.6  
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP <sup>a</sup>	W-XXX <sup>b</sup>
Fire barriers	>1	NP <sup>a</sup>	W-XXX <sup>b</sup>
	1	NP <sup>a</sup>	W-XXX <sup>b</sup>
Incidental use areas (707.3.7), Mixed occupancy separations (707.3.9)	1	$\frac{3}{4}$	OH-45 or W-60
Fire partitions	1	$\frac{3}{4}$	OH-45 or W-60
	0.5	$\frac{1}{3}$	OH-20 or W-30
Smoke barriers	1	$\frac{3}{4}$	OH-45 or W-60
Exterior walls	>1	$1\frac{1}{2}$	OH-90 or W-XXX <sup>b</sup>
	1	$\frac{3}{4}$	OH-45 or W-60
	0.5	$\frac{1}{3}$	OH-20 or W-30
Party wall	All	NP	Not Applicable

NP = Not Permitted.

a. Not permitted except fire-resistance-rated glazing assemblies tested to ASTM E 119 or UL 263, as specified in Section 716.2.

b. XXX = The fire rating duration period in minutes, which shall be equal to the fire-resistance rating required for the wall assembly.

**716.6.7.1 Where  $\frac{3}{4}$ -hour fire protection window assemblies permitted.** Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 716.6 shall be limited to fire partitions designed in accordance with Section 708 and fire barriers utilized in the applications set forth in Sections 707.3.7 and 707.3.9 where the fire-resistance rating does not exceed 1 hour. Fire-resistance-rated glazing assemblies tested in accordance with ASTM E 119 or UL 263 shall not be subject to the limitations of this section.

**716.6.7.2 Area limitations.** The total area of the glazing in fire-protection-rated windows assemblies shall not exceed 25 percent of the area of a common wall with any room.

**716.6.7.3 Where  $\frac{1}{3}$ -hour fire-protection window assemblies permitted.** Fire-protection-rated glazing shall be permitted in window assemblies tested to NFPA 257 or UL 9 in smoke barriers and fire partitions requiring  $\frac{1}{3}$ -hour opening protection in accordance with Table 716.6.

**716.6.8 Labeling requirements.** Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Table 716.6 that shall be issued by an approved agency and shall be permanently identified on the glazing.

## SECTION 717 DUCTS AND AIR TRANSFER OPENINGS

**717.1 General.** The provisions of this section shall govern the protection of duct penetrations and air transfer openings in assemblies required to be protected and duct penetrations in nonfire-resistance-rated floor assemblies.

**717.1.1 Ducts that penetrate fire-resistance-rated assemblies without dampers.** Ducts that penetrate fire-resistance-rated assemblies and are not required by this section to have dampers shall comply with the requirements of Sections 714.2 through 714.3.3. Ducts that penetrate horizontal assemblies not required to be contained within a shaft and not required by this section to have dampers shall comply with the requirements of Sections 714.4 through 714.4.2.2.

**717.1.1.1 Ducts that penetrate nonfire-resistance-rated assemblies.** The space around a duct penetrating a nonfire-resistance-rated floor assembly shall comply with Section 717.6.3.

**717.2 Installation.** Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, the manufacturer's installation instructions and the dampers' listing.

**717.2.1 Smoke control system.** Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternative protection shall be utilized. Where

mechanical systems including ducts and dampers utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

**717.2.2 Hazardous exhaust ducts.** Fire dampers for hazardous exhaust duct systems shall comply with the *California Mechanical Code*.

**717.3 Damper testing, ratings and actuation.** Damper testing, ratings and actuation shall be in accordance with Sections 717.3.1 through 717.3.3.

**717.3.1 Damper testing.** Dampers shall be listed and labeled in accordance with the standards in this section. Fire dampers shall comply with the requirements of UL 555. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263.

**717.3.2 Damper rating.** Damper ratings shall be in accordance with Sections 717.3.2.1 through 717.3.2.3.

**717.3.2.1 Fire damper ratings.** Fire dampers shall have the minimum fire protection rating specified in Table 717.3.2.1 for the type of penetration.

TABLE 717.3.2.1  
FIRE DAMPER RATING

TYPE OF PENETRATION	MINIMUM DAMPER RATING (hours)
Less than 3-hour fire-resistance-rated assemblies	1.5
3-hour or greater fire-resistance-rated assemblies	3

**717.3.2.2 Smoke damper ratings.** Smoke damper leakage ratings shall be Class I or II. Elevated temperature ratings shall not be less than 250°F (121°C).

**717.3.2.3 Combination fire/smoke damper ratings.** Combination fire/smoke dampers shall have the minimum fire protection rating specified for fire dampers in Table 717.3.2.1 for the type of penetration and shall also have a minimum smoke damper rating as specified in Section 717.3.2.2.

**717.3.3 Damper actuation.** Damper actuation shall be in accordance with Sections 717.3.3.1 through 717.3.3.4 as applicable.

**717.3.3.1 Fire damper actuation device.** The fire damper actuation device shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).

2. The operating temperature shall be not more than 350°F (177°C) where located in a smoke control system complying with Section 909.

**717.3.3.2 Smoke damper actuation.** The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.3 and one of the following methods, as applicable:

1. Where a smoke damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. Where a smoke damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.
3. Where a smoke damper is installed within an air transfer opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper.
4. Where a smoke damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.
5. Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, smoke dampers shall be permitted to be controlled by the smoke detection system.

**717.3.3.3 Combination fire/smoke damper actuation.** Combination fire/smoke damper actuation shall be in accordance with Sections 717.3.3.1 and 717.3.3.2. Combination fire/smoke dampers installed in smoke control system shaft penetrations shall not be activated by local area smoke detection unless it is secondary to the smoke management system controls.

**717.3.3.4 Ceiling radiation damper actuation.** The operating temperature of a ceiling radiation damper actuation device shall be 50°F (27.8°C) above the normal temperature within the duct system, but not less than 160°F (71°C).

**717.4 Access and identification.** Fire and smoke dampers shall be provided with an approved means of access, which is large enough to permit inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the

exterior by a label having letters not less than  $\frac{1}{2}$  inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

**717.5 Where required.** Fire dampers, smoke dampers and combination fire/smoke dampers shall be provided at the locations prescribed in Sections 717.5.1 through 717.5.7 and 717.6. Where an assembly is required to have both fire dampers and smoke dampers, combination fire/smoke dampers or a fire damper and a smoke damper shall be required.

**717.5.1 Fire walls.** Ducts and air transfer openings permitted in fire walls in accordance with Section 706.11 shall be protected with listed fire dampers installed in accordance with their listing.

**717.5.1.1 Horizontal exits.** A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a fire wall that serves as a horizontal exit.

**717.5.2 Fire barriers.** In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal. Ducts and air transfer openings of fire barriers shall be protected with approved fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for stairways, ramps and exit passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

**Exception:** Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire damper would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

[SFM] For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, ducts and air transfer openings of fire barriers shall be protected with approved fire and smoke dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate exit enclo-

sures and exit passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

**Exceptions:**

1. Fire dampers are not required at penetrations of fire barriers where penetrations are tested in accordance with ASTM E119 as part of the fire-resistance rated assembly.
2. Fire and smoke dampers are not required where ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire or smoke damper would interfere with the operation of a smoke control system.

**717.5.2.1 Horizontal exits.** A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a fire barrier that serves as a horizontal exit.

**717.5.3 Shaft enclosures.** Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

**Exceptions:**

1. Fire dampers are not required at penetrations of shafts where:
  - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
  - 1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
  - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
  - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
  - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.0187-inch (0.4712 mm) (No. 26 gage);
  - 2.2. The subducts extend at least 22 inches (559 mm) vertically; and

2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.

3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *California Mechanical Code*.

**717.5.4 Fire partitions.** In other than Group A, E, I and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

**Exceptions:** In occupancies other than Group H and L, fire dampers are not required where any of the following apply:

1. Corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 714.
2. Tenant partitions in covered and open mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of approved materials in accordance with the *California Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
  - 3.1. The duct shall not exceed 100 square inches ( $0.06 \text{ m}^2$ ).
  - 3.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.
  - 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
  - 3.4. The duct shall be installed above a ceiling.

- 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
- 3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 1½-inch by 1½-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.
4. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

*For Group A, E, I and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listings.*

**Exceptions:**

1. *Fire dampers are not required in corridor penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness, protected as a through penetration in accordance with Section 713 and there are no openings serving the corridor.*
2. *Fire dampers are not required where the duct system is constructed of approved materials in accordance with the California Mechanical Code and the duct penetrating the wall complies with all of the following requirements:*
  - 2.1. *For other than corridors in Group I-2 occupancies the duct shall not exceed 100 square inches (0.6 m<sup>2</sup>).*
  - 2.2. *The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.*
  - 2.3. *The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.*
  - 2.4. *The duct shall be installed above a ceiling.*

- 2.5. *The duct shall not terminate at a wall register in the fire-resistance rated wall.*
- 2.6. *The duct shall be protected as a through penetration in accordance with Section 714 or shall comply with the all of the following:*
1. *A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening.*
  2. *The sleeve shall be secured to both sides of the wall and for all four sides of the sleeve with minimum 1½-inch by 1½-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles.*
  3. *The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws.*
  4. *The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.*

**717.5.4.1 Corridors.** *In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal a listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a corridor enclosure required to have smoke and draft control doors in accordance with Section 716.5.3.*

**Exceptions:**

1. Smoke dampers are not required where the building is equipped throughout with an approved smoke control system in accordance with Section 909, and smoke dampers are not necessary for the operation and control of the system.
2. Smoke dampers are not required in corridor penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the corridor.

*[SFM] For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, a listed smoke damper designed to resist the passage of smoke shall also be provided at each point a duct or air transfer opening penetrates a fire-resistance rated corridor enclosure required to have smoke and draft doors in accordance with Section 716.5.3.*

**Exceptions:**

1. *Smoke dampers are not required where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.*
2. *Smoke damper are not required in corridor penetrations where the duct is constructed of*

*steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the corridor.*

**717.5.5 Smoke barriers.** A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a smoke barrier. Smoke dampers and smoke damper actuation methods shall comply with Section 717.3.3.2.

**Exception:** Smoke dampers are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.

**717.5.6 Exterior walls.** Ducts and air transfer openings in fire-resistance-rated exterior walls required to have protected openings in accordance with Section 705.10 shall be protected with listed fire dampers installed in accordance with their listing.

**717.5.7 Smoke partitions.** A listed smoke damper designed to resist the passage of smoke shall be provided at each point that an air transfer opening penetrates a smoke partition. Smoke dampers and smoke damper actuation methods shall comply with Section 717.3.3.2.

**Exception:** Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternative protection shall be utilized.

**717.6 Horizontal assemblies.** Penetrations by ducts and air transfer openings of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected by a shaft enclosure that complies with Section 713 or shall comply with Sections 717.6.1 through 717.6.3.

**717.6.1 Through penetrations.** In occupancies other than Groups I-2, I-2.1 and I-3, a duct constructed of approved materials in accordance with the *California Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 714.4. For air transfer openings, see Section 712.1.8.

**Exception:** A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided such duct meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712 mm) (No. 26 gage).
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m<sup>2</sup>) in any 100 square feet (9.3 m<sup>2</sup>) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste

where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 717.6.2.1.

**717.6.2 Membrane penetrations.** Ducts and air transfer openings constructed of approved materials in accordance with the *California Mechanical Code* that penetrate the ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with one of the following:

1. A shaft enclosure in accordance with Section 713.
2. A listed ceiling radiation damper installed at the ceiling line where a duct penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.
3. A listed ceiling radiation damper installed at the ceiling line where a diffuser with no duct attached penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.

**717.6.2.1 Ceiling radiation dampers.** Ceiling radiation dampers shall be tested in accordance with Section 717.3.1. Ceiling radiation dampers shall be installed in accordance with the details listed in the fire-resistance-rated assembly and the manufacturer's installation instructions and the listing. Ceiling radiation dampers are not required where either of the following applies:

1. Tests in accordance with ASTM E 119 or UL 263 have shown that ceiling radiation dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 714.4.1.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.

**717.6.3 Nonfire-resistance-rated floor assemblies.** Duct systems constructed of approved materials in accordance with the *California Mechanical Code* that penetrate non-fire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 713.
2. The duct connects not more than two stories, and the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the products of combustion.
3. The duct connects not more than three stories, and the annular space around the penetrating duct is protected with an approved noncombustible material that resists the free passage of flame and the prod-

ucts of combustion and a fire damper is installed at each floor line.

**Exception:** Fire dampers are not required in ducts within individual residential dwelling units.

**717.7 Flexible ducts and air connectors.** Flexible ducts and air connectors shall not pass through any fire-resistance-rated assembly. Flexible air connectors shall not pass through any wall, floor or ceiling.

## SECTION 718 CONCEALED SPACES

**718.1 General.** Fireblocking and draftstopping shall be installed in combustible concealed locations in accordance with this section. Fireblocking shall comply with Section 718.2. Draftstopping in floor/ceiling spaces and attic spaces shall comply with Sections 718.3 and 718.4, respectively. The permitted use of combustible materials in concealed spaces of buildings of Type I or II construction shall be limited to the applications indicated in Section 718.5.

**718.2 Fireblocking.** In combustible construction, fireblocking shall be installed to cut off concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space. Fireblocking shall be installed in the locations specified in Sections 718.2.2 through 718.2.7.

**718.2.1 Fireblocking materials.** Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as tested for the specific application.

**718.2.1.1 Batts or blankets of mineral wool or mineral fiber.** Batts or blankets of mineral wool or mineral fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

**718.2.1.2 Unfaced fiberglass.** Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16

inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

**718.2.1.3 Loose-fill insulation material.** Loose-fill insulation material, insulating foam sealants and caulk materials shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

**718.2.1.4 Fireblocking integrity.** The integrity of fireblocks shall be maintained.

**718.2.1.5 Double stud walls.** Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be allowed as fireblocking in walls constructed using parallel rows of studs or staggered studs.

**718.2.2 Concealed wall spaces.** Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, as follows:

1. Vertically at the ceiling and floor levels.
2. Horizontally at intervals not exceeding 10 feet (3048 mm).

**718.2.3 Connections between horizontal and vertical spaces.** Fireblocking shall be provided at interconnections between concealed vertical stud wall or partition spaces and concealed horizontal spaces created by an assembly of floor joists or trusses, and between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings and similar locations.

**718.2.4 Stairways.** Fireblocking shall be provided in concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall also comply with Section 1009.9.3.

**718.2.5 Ceiling and floor openings.** Where required by Section 712.1.7, Exception 1 of Section 714.4.1.2 or Section 714.4.2, fireblocking of the annular space around vents, pipes, ducts, chimneys and fireplaces at ceilings and floor levels shall be installed with a material specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and resist the free passage of flame and the products of combustion.

**718.2.5.1 Factory-built chimneys and fireplaces.** Factory-built chimneys and fireplaces shall be fireblocked in accordance with UL 103 and UL 127.

**718.2.6 Exterior wall coverings.** Fireblocking shall be installed within concealed spaces of exterior wall coverings and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1406 or where erected with combustible frames. Fireblocking shall be installed at maximum intervals of 20 feet (6096 mm) in either dimension so that there will be no concealed space exceeding 100 square feet ( $9.3\text{ m}^2$ ) between fireblocking. Where wood furring strips are used, they shall be of approved wood of natural decay resistance

or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with at least 4 inches (102 mm) of separation between sections.

**Exceptions:**

1. Fireblocking of cornices is not required in single-family dwellings. Fireblocking of cornices of a two-family dwelling is required only at the line of dwelling unit separation.
2. Fireblocking shall not be required where the exterior wall covering is installed on noncombustible framing and the face of the exterior wall covering exposed to the concealed space is covered by one of the following materials:
  - 2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
  - 2.2. Corrosion-resistant steel having a base metal thickness not less than 0.016 inch (0.4 mm) at any point.
  - 2.3. Other approved noncombustible materials.
3. Fireblocking shall not be required where the exterior wall covering has been tested in accordance with, and complies with the acceptance criteria of, NFPA 285. The exterior wall covering shall be installed as tested in accordance with NFPA 285.

**718.2.7 Concealed sleeper spaces.** Where wood sleepers are used for laying wood flooring on masonry or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an approved material to resist the free passage of flame and products of combustion or fireblocked in such a manner that there will be no open spaces under the flooring that will exceed 100 square feet ( $9.3 \text{ m}^2$ ) in area and such space shall be filled solidly under permanent partitions so that there is no communication under the flooring between adjoining rooms.

**Exceptions:**

1. Fireblocking is not required for slab-on-grade floors in gymnasiums.
2. Fireblocking is required only at the juncture of each alternate lane and at the ends of each lane in a bowling facility.

**718.3 Draftstopping in floors.** In combustible construction, draftstopping shall be installed to subdivide floor/ceiling assemblies in the locations prescribed in Sections 718.3.2 through 718.3.3.

**718.3.1 Draftstopping materials.** Draftstopping materials shall not be less than  $\frac{1}{2}$ -inch (12.7 mm) gypsum board,  $\frac{3}{8}$ -inch (9.5 mm) wood structural panel,  $\frac{3}{8}$ -inch (9.5 mm) particleboard, 1-inch (25-mm) nominal lumber, cement fiberboard, batts or blankets of mineral wool or glass fiber, or other approved materials adequately supported. The integrity of draftstops shall be maintained.

**718.3.2 Groups R-1, R-2, R-3 and R-4.** Draftstopping shall be provided in floor/ceiling spaces in Group R-1

buildings, in Group R-2 buildings with three or more dwelling units, in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.

**Exceptions:**

1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces where the draftstopping is being omitted.

**718.3.3 Other groups.** In other groups, draftstopping shall be installed so that horizontal floor areas do not exceed 1,000 square feet ( $93 \text{ m}^2$ ).

**Exceptions:**

1. *In other than Group A, E, H, I, L and R-2.1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.*
2. *In Group A, E, H, I and L occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, where an automatic sprinkler system in accordance with Section 903.3.1.1 is installed, the area between draft stops may be 3,000 square feet ( $279 \text{ m}^2$ ) and the greatest horizontal dimension may be 100 feet (30 480 mm).*

**718.4 Draftstopping in attics.** In combustible construction, draftstopping shall be installed to subdivide attic spaces and concealed roof spaces in the locations prescribed in Sections 718.4.2 and 718.4.3. Ventilation of concealed roof spaces shall be maintained in accordance with Section 1203.2.

**718.4.1 Draftstopping materials.** Materials utilized for draftstopping of attic spaces shall comply with Section 718.3.1.

**718.4.1.1 Openings.** Openings in the partitions shall be protected by self-closing doors with automatic latches constructed as required for the partitions.

**718.4.2 Groups R-1 and R-2.** Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling unit separation walls that do not extend to the underside of the roof sheathing above.

**Exceptions:**

1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.

2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories above grade plane, the attic space shall be subdivided by draftstops into areas not exceeding 3,000 square feet ( $279 \text{ m}^2$ ) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed space where the draftstopping is being omitted.

**718.4.3 Other groups.** Draftstopping shall be installed in attics and concealed roof spaces, such that any horizontal area does not exceed 3,000 square feet ( $279 \text{ m}^2$ ).

**Exceptions:**

1. *In other than Group A, E, H, I and L and R-2.1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.*
2. *In Group A, E, H, I, L and R-2.1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, where an automatic sprinkler system in accordance with Section 903.3.1.1 is installed, the area between draft stops may be 9,000 square feet ( $836 \text{ m}^2$ ) and the greatest horizontal dimension may be 100 feet (30 480 mm).*

**718.5 Combustible materials in concealed spaces in Type I or II construction.** Combustible materials shall not be permitted in concealed spaces of buildings of Type I or II construction.

**Exceptions:**

1. Combustible materials in accordance with Section 603.
2. Combustible materials exposed within plenums complying with Section 602 of the *California Mechanical Code*.
3. Class A interior finish materials classified in accordance with Section 803.
4. Combustible piping within partitions or shaft enclosures installed in accordance with the provisions of this code.
5. Combustible piping within concealed ceiling spaces installed in accordance with the *California Mechanical Code* and the *California Plumbing Code*.
6. Combustible insulation and covering on pipe and tubing, installed in concealed spaces other than plenums, complying with Section 720.7.

## SECTION 719 FIRE-RESISTANCE REQUIREMENTS FOR PLASTER

**719.1 Thickness of plaster.** The minimum thickness of gypsum plaster or Portland cement plaster used in a fire-resistance-rated system shall be determined by the prescribed fire tests. The plaster thickness shall be measured from the face of the lath where applied to gypsum lath or metal lath.

**719.2 Plaster equivalents.** For fire-resistance purposes,  $\frac{1}{2}$  inch (12.7 mm) of unsanded gypsum plaster shall be deemed equivalent to  $\frac{3}{4}$  inch (19.1 mm) of one-to-three gypsum sand plaster or 1 inch (25 mm) of Portland cement sand plaster.

**719.3 Noncombustible furring.** In buildings of Type I and II construction, plaster shall be applied directly on concrete or masonry or on approved noncombustible plastering base and furring.

**719.4 Double reinforcement.** Plaster protection more than 1 inch (25 mm) in thickness shall be reinforced with an additional layer of approved lath embedded at least  $\frac{3}{4}$  inch (19.1 mm) from the outer surface and fixed securely in place.

**Exception:** Solid plaster partitions or where otherwise determined by fire tests.

**719.5 Plaster alternatives for concrete.** In reinforced concrete construction, gypsum plaster or Portland cement plaster is permitted to be substituted for  $\frac{1}{2}$  inch (12.7 mm) of the required poured concrete protection, except that a minimum thickness of  $\frac{3}{8}$  inch (9.5 mm) of poured concrete shall be provided in reinforced concrete floors and 1 inch (25 mm) in reinforced concrete columns in addition to the plaster finish. The concrete base shall be prepared in accordance with Section 2510.7.

## SECTION 720 THERMAL- AND SOUND-INSULATING MATERIALS

**720.1 General.** Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture or other atmospheric conditions shall not be permitted.

**Exceptions:**

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *California Mechanical Code*.
4. All layers of single and multilayer reflective plastic core insulation shall comply with Section 2613.

**720.2 Concealed installation.** Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

**Exception:** Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 720.6, shall only be required to meet the smoke-developed index of not more than 450.

**720.2.1 Facings.** Where such materials are installed in concealed spaces in buildings of Type III, IV or V construction, the flame spread and smoke-developed limitations do not apply to facings, coverings, and layers of reflective foil insulation that are installed behind and in substantial contact with the unexposed surface of the ceiling, wall or floor finish.

**Exception:** All layers of single and multilayer reflective plastic core insulation shall comply with Section 2613.

**720.3 Exposed installation.** Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

**Exception:** Cellulose loose-fill insulation that is not spray applied complying with the requirements of Section 720.6 shall only be required to meet the smoke-developed index of not more than 450.

**720.3.1 Attic floors.** Exposed insulation materials installed on attic floors shall have a critical radiant flux of not less than 0.12 watt per square centimeter when tested in accordance with ASTM E 970.

**720.4 Loose-fill insulation.** Loose-fill insulation materials that cannot be mounted in the ASTM E 84 or UL 723 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 720.2 and 720.3 when tested in accordance with CAN/ULC S102.2.

**Exception:** Cellulose loose-fill insulation shall not be required to be tested in accordance with CAN/ULC S102.2, provided such insulation complies with the requirements of Section 720.2 or 720.3, as applicable, and Section 720.6.

**720.5 Roof insulation.** The use of combustible roof insulation not complying with Sections 720.2 and 720.3 shall be permitted in any type of construction provided it is covered with approved roof coverings directly applied thereto.

**720.6 Cellulose loose-fill insulation.** Cellulose loose-fill insulation shall comply with CPSC 16 CFR Part 1209 and

CPSC 16 CFR Part 1404. Each package of such insulating material shall be clearly labeled in accordance with CPSC 16 CFR Part 1209 and CPSC 16 CFR Part 1404.

**720.7 Insulation and covering on pipe and tubing.** Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

**Exception:** Insulation and covering on pipe and tubing installed in plenums shall comply with the *California Mechanical Code*.

## SECTION 721 PRESCRIPTIVE FIRE RESISTANCE

**721.1 General.** The provisions of this section contain prescriptive details of fire-resistance-rated building elements, components or assemblies. The materials of construction listed in Tables 721.1(1), 721.1(2), and 721.1(3) shall be assumed to have the fire-resistance ratings prescribed therein. Where materials that change the capacity for heat dissipation are incorporated into a fire-resistance-rated assembly, fire test results or other substantiating data shall be made available to the building official to show that the required fire-resistance-rating time period is not reduced.

**721.1.1 Thickness of protective coverings.** The thickness of fire-resistant materials required for protection of structural members shall be not less than set forth in Table 721.1(1), except as modified in this section. The figures shown shall be the net thickness of the protecting materials and shall not include any hollow space in back of the protection.

**721.1.2 Unit masonry protection.** Where required, metal ties shall be embedded in bed joints of unit masonry for protection of steel columns. Such ties shall be as set forth in Table 721.1(1) or be equivalent thereto.

**721.1.3 Reinforcement for cast-in-place concrete column protection.** Cast-in-place concrete protection for steel columns shall be reinforced at the edges of such members with wire ties of not less than 0.18 inch (4.6 mm) in diameter wound spirally around the columns on a pitch of not more than 8 inches (203 mm) or by equivalent reinforcement.

**721.1.4 Plaster application.** The finish coat is not required for plaster protective coatings where they comply with the design mix and thickness requirements of Tables 721.1(1), 721.1(2) and 721.1(3).

**TABLE 721.1(1)**  
**MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS**  
**FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS<sup>m</sup>**

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hours	3 hours	2 hours	1 hour
1. Steel columns and all of primary trusses (continued)	1-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 6" × 6" or greater (not including sandstone, granite and siliceous gravel). <sup>a</sup>	2 <sup>1</sup> / <sub>2</sub>	2	1 <sup>1</sup> / <sub>2</sub>	1
	1-1.2	Carbonate, lightweight and sand-lightweight aggregate concrete, members 8" × 8" or greater (not including sandstone, granite and siliceous gravel). <sup>a</sup>	2	1 <sup>1</sup> / <sub>2</sub>	1	1
	1-1.3	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" × 12" or greater (not including sandstone, granite and siliceous gravel). <sup>a</sup>	1 <sup>1</sup> / <sub>2</sub>	1	1	1
	1-1.4	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 6" × 6" or greater. <sup>a</sup>	3	2	1 <sup>1</sup> / <sub>2</sub>	1
	1-1.5	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 8" × 8" or greater. <sup>a</sup>	2 <sup>1</sup> / <sub>2</sub>	2	1	1
	1-1.6	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 12" × 12" or greater. <sup>a</sup>	2	1	1	1
	1-2.1	Clay or shale brick with brick and mortar fill. <sup>a</sup>	3 <sup>3</sup> / <sub>4</sub>	—	—	2 <sup>1</sup> / <sub>4</sub>
	1-3.1	4" hollow clay tile in two 2" layers; 1 <sup>1</sup> / <sub>2</sub> " mortar between tile and column; 3 <sup>7</sup> / <sub>8</sub> " metal mesh 0.046" wire diameter in horizontal joints; tile fill. <sup>a</sup>	4	—	—	—
	1-3.2	2" hollow clay tile; 3 <sup>1</sup> / <sub>4</sub> " mortar between tile and column; 3 <sup>7</sup> / <sub>8</sub> " metal mesh 0.046" wire diameter in horizontal joints; limestone concrete fill <sup>a</sup> ; plastered with 3 <sup>1</sup> / <sub>4</sub> " gypsum plaster.	3	—	—	—
	1-3.3	2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile or 3 <sup>7</sup> / <sub>8</sub> " metal mesh 0.046" diameter wire in horizontal joints; limestone or trap-rock concrete fill <sup>a</sup> extending 1" outside column on all sides.	—	—	3	—
	1-3.4	2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile with or without concrete fill; 3 <sup>1</sup> / <sub>4</sub> " mortar between tile and column.	—	—	—	2
	1-4.1	Cement plaster over metal lath wire tied to 3 <sup>1</sup> / <sub>4</sub> " cold-rolled vertical channels with 0.049" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1:2 1 <sup>1</sup> / <sub>2</sub> by volume, cement to sand.	—	—	2 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>
	1-5.1	Vermiculite concrete, 1:4 mix by volume over paperbacked wire fabric lath wrapped directly around column with additional 2" × 2" 0.065" / 0.065" (No. 16/16 B.W. gage) wire fabric placed 3 <sup>1</sup> / <sub>4</sub> " from outer concrete surface. Wire fabric tied with 0.049" (No. 18 B.W. gage) wire spaced 6" on center for inner layer and 2" on center for outer layer.	2	—	—	—
	1-6.1	Perlite or vermiculite gypsum plaster over metal lath wrapped around column and furred 1 <sup>1</sup> / <sub>4</sub> " from column flanges. Sheets lapped at ends and tied at 6" intervals with 0.049" (No. 18 B.W. gage) tie wire. Plaster pushed through to flanges.	1 <sup>1</sup> / <sub>2</sub>	1	—	—
	1-6.2	Perlite or vermiculite gypsum plaster over self-furring metal lath wrapped directly around column, lapped 1" and tied at 6" intervals with 0.049" (No. 18 B.W. gage) wire.	1 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	1	—
	1-6.3	Perlite or vermiculite gypsum plaster on metal lath applied to 3 <sup>1</sup> / <sub>4</sub> " cold-rolled channels spaced 24" apart vertically and wrapped flatwise around column.	1 <sup>1</sup> / <sub>2</sub>	—	—	—
	1-6.4	Perlite or vermiculite gypsum plaster over two layers of 1 <sup>1</sup> / <sub>2</sub> " plain full-length gypsum lath applied tight to column flanges. Lath wrapped with 1" hexagonal mesh of No. 20 gage wire and tied with doubled 0.035" diameter (No. 18 B.W. gage) wire ties spaced 23" on center. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 <sup>1</sup> / <sub>2</sub> cubic feet of aggregate for the 3-hour system.	2 <sup>1</sup> / <sub>2</sub>	2	—	—

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(1)—continued  
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS  
FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS<sup>m</sup>

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hours	3 hours	2 hours	1 hour
1. Steel columns and all of primary trusses	1-6.5	Perlite or vermiculite gypsum plaster over one layer of $\frac{1}{2}$ " plain full-length gypsum lath applied tight to column flanges. Lath tied with doubled 0.049" (No. 18 B.W. gage) wire ties spaced 23" on center and scratch coat wrapped with 1" hexagonal mesh 0.035" (No. 20 B.W. gage) wire fabric. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to $2\frac{1}{2}$ cubic feet of aggregate.	—	2	—	—
	1-7.1	Multiple layers of $\frac{1}{2}$ " gypsum wallboard <sup>d</sup> adhesively <sup>d</sup> secured to column flanges and successive layers. Wallboard applied without horizontal joints. Corner edges of each layer staggered. Wallboard layer below outer layer secured to column with doubled 0.049" (No. 18 B.W. gage) steel wire ties spaced 15" on center. Exposed corners taped and treated.	—	—	2	1
	1-7.2	Three layers of $\frac{5}{8}$ " Type X gypsum wallboard. <sup>c</sup> First and second layer held in place by $\frac{1}{8}$ " diameter by $1\frac{3}{8}$ " long ring shank nails with $\frac{5}{16}$ " diameter heads spaced 24" on center at corners. Middle layer also secured with metal straps at mid-height and 18" from each end, and by metal corner bead at each corner held by the metal straps. Third layer attached to corner bead with 1" long gypsum wallboard screws spaced 12" on center.	—	—	$1\frac{7}{8}$	—
	1-7.3	Three layers of $\frac{5}{8}$ " Type X gypsum wallboard, <sup>c</sup> each layer screw attached to $1\frac{5}{8}$ " steel studs 0.018" thick (No. 25 carbon sheet steel gage) at each corner of column. Middle layer also secured with 0.049" (No. 18 B.W. gage) double-strand steel wire ties, 24" on center. Screws are No. 6 by 1" spaced 24" on center for inner layer, No. 6 by $1\frac{7}{8}$ " spaced 12" on center for middle layer and No. 8 by $2\frac{1}{4}$ " spaced 12" on center for outer layer.	—	$1\frac{7}{8}$	—	—
	1-8.1	Wood-fibered gypsum plaster mixed 1:1 by weight gypsum-to-sand aggregate applied over metal lath. Lath lapped 1" and tied 6" on center at all end, edges and spacers with 0.049" (No. 18 B.W. gage) steel tie wires. Lath applied over $\frac{1}{2}$ " spacers made of $\frac{3}{4}$ " furring channel with 2" legs bent around each corner. Spacers located 1" from top and bottom of member and a maximum of 40" on center and wire tied with a single strand of 0.049" (No. 18 B.W. gage) steel tie wires. Corner bead tied to the lath at 6" on center along each corner to provide plaster thickness.	—	—	$1\frac{5}{8}$	—
	1-9.1	Minimum W8x35 wide flange steel column ( $w/d \geq 0.75$ ) with each web cavity filled even with the flange tip with normal weight carbonate or siliceous aggregate concrete (3,000 psi minimum compressive strength with $145 \text{pcf} \pm 3 \text{pcf}$ unit weight). Reinforce the concrete in each web cavity with a minimum No. 4 deformed reinforcing bar installed vertically and centered in the cavity, and secured to the column web with a minimum No. 2 horizontal deformed reinforcing bar welded to the web every 18" on center vertically. As an alternative to the No. 4 rebar, $\frac{3}{4}$ " diameter by 3" long headed studs, spaced at 12" on center vertically, shall be welded on each side of the web midway between the column flanges.	—	—	—	See Note n
2. Webs or flanges of steel beams and girders (continued)	2-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete (not including sand-stone, granite and siliceous gravel) with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	2	$1\frac{1}{2}$	1	1
	2-1.2	Siliceous aggregate concrete and concrete excluded in Item 2-1.1 with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	$2\frac{1}{2}$	2	$1\frac{1}{2}$	1
	2-2.1	Cement plaster on metal lath attached to $\frac{3}{4}$ " cold-rolled channels with 0.04" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1:2 $\frac{1}{2}$ by volume, cement to sand.	—	—	$2\frac{1}{2}$ <sup>b</sup>	$\frac{7}{8}$

(continued)

**TABLE 721.1(1)—continued**  
**MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS**  
**FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS<sup>m</sup>**

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hours	3 hours	2 hours	1 hour
2. Webs or flanges of steel beams and girders	2-3.1	Vermiculite gypsum plaster on a metal lath cage, wire tied to 0.165" diameter (No. 8 B.W. gage) steel wire hangers wrapped around beam and spaced 16" on center. Metal lath ties spaced approximately 5" on center at cage sides and bottom.	—	7/8	—	—
	2-4.1	Two layers of 5/8" Type X gypsum wallboard <sup>c</sup> are attached to U-shaped brackets spaced 24" on center. 0.018" thick (No. 25 carbon sheet steel gage) 1 5/8" deep by 1" galvanized steel runner channels are first installed parallel to and on each side of the top beam flange to provide a 1/2" clearance to the flange. The channel runners are attached to steel deck or concrete floor construction with approved fasteners spaced 12" on center. U-shaped brackets are formed from members identical to the channel runners. At the bent portion of the U-shaped bracket, the flanges of the channel are cut out so that 1 5/8" deep corner channels can be inserted without attachment parallel to each side of the lower flange. As an alternative, 0.021" thick (No. 24 carbon sheet steel gage) 1" × 2" runner and corner angles may be used in lieu of channels, and the web cutouts in the U-shaped brackets may be omitted. Each angle is attached to the bracket with 1/2"-long No. 8 self-drilling screws. The vertical legs of the U-shaped bracket are attached to the runners with one 1/2" long No. 8 self-drilling screw. The completed steel framing provides a 2 1/8" and 1 1/2" space between the inner layer of wallboard and the sides and bottom of the steel beam, respectively. The inner layer of wallboard is attached to the top runners and bottom corner channels or corner angles with 1 1/4"-long No. 6 self-drilling screws spaced 16" on center. The outer layer of wallboard is applied with 1 3/4"-long No. 6 self-drilling screws spaced 8" on center. The bottom corners are reinforced with metal corner beads.	—	—	1 1/4	—
	2-4.2	Three layers of 5/8" Type X gypsum wallboard <sup>c</sup> attached to a steel suspension system as described immediately above utilizing the 0.018" thick (No. 25 carbon sheet steel gage) 1" × 2" lower corner angles. The framing is located so that a 2 1/8" and 2" space is provided between the inner layer of wallboard and the sides and bottom of the beam, respectively. The first two layers of wallboard are attached as described immediately above. A layer of 0.035" thick (No. 20 B.W. gage) 1" hexagonal galvanized wire mesh is applied under the soffit of the middle layer and up the sides approximately 2". The mesh is held in position with the No. 6 1 5/8"-long screws installed in the vertical leg of the bottom corner angles. The outer layer of wallboard is attached with No. 6 2 1/4"-long screws spaced 8" on center. One screw is also installed at the mid-depth of the bracket in each layer. Bottom corners are finished as described above.	—	1 7/8	—	—
3. Bonded pre-tensioned reinforcement in prestressed concrete <sup>e</sup>	3-1.1	Carbonate, lightweight, sand-lightweight and siliceous <sup>f</sup> aggregate concrete Beams or girders	4 <sup>g</sup>	3 <sup>g</sup>	2 1/2	1 1/2
		Solid <sup>h</sup>		2	1 1/2	1

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(1) —continued  
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS  
FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS<sup>m</sup>

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hours	3 hours	2 hours	1 hour
4. Bonded or unbonded post-tensioned tendons in prestressed concrete <sup>e,i</sup>	4-1.1	Carbonate, lightweight, sand-lightweight and siliceous <sup>f</sup> aggregate concrete Unrestrained members: Solid slabs <sup>h</sup> Beams and girders <sup>j</sup> 8" wide greater than 12" wide	— 3	2 4½ 2½	1½ 2½ 2	— 1¾ 1½
	4-1.2	Carbonate, lightweight, sand-lightweight and siliceous aggregate Restrained members: <sup>k</sup> Solid slabs <sup>h</sup> Beams and girders <sup>j</sup> 8" wide greater than 12" wide	1¼ 2 2	1 2 1¾	¾ 1¾ 1½	— — —
5. Reinforcing steel in reinforced concrete columns, beams girders and trusses	5-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.) Siliceous aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	1½ 2	1½ 1½	1½ 1½	1½ 1½
6. Reinforcing steel in reinforced concrete joists <sup>l</sup>	6-1.1 6-1.2	Carbonate, lightweight and sand-lightweight aggregate concrete Siliceous aggregate concrete	1¼ 1¾	1¼ 1½	1 1	¾ ¾
7. Reinforcing and tie rods in floor and roof slabs <sup>l</sup>	7-1.1 7-1.2	Carbonate, lightweight and sand-lightweight aggregate concrete Siliceous aggregate concrete	1 1¼	1 1	¾ 1	¾ ¾

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm<sup>2</sup>, 1 cubic foot = 0.0283 m<sup>3</sup>, 1 pound per cubic foot = 16.02 kg/m<sup>3</sup>.

- a. Reentrant parts of protected members to be filled solidly.
- b. Two layers of equal thickness with a ¾ inch airspace between.
- c. For all of the construction with gypsum wallboard described in Table 721.1(1), gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard and the joints on the face layer are reinforced, and the entire surface is covered with a minimum of 1/16 inch gypsum veneer plaster.
- d. An approved adhesive qualified under ASTM E 119 or UL 263.
- e. Where lightweight or sand lightweight concrete having an oven dry weight of 110 pounds per cubic foot or less is used, the tabulated minimum cover shall be permitted to be reduced 25 percent, except that in no case shall the cover be less than ¾ inch in slabs or 1½ inches in beams or girders.
- f. For solid slabs of siliceous aggregate concrete, increase tendon cover 20 percent.
- g. Adequate provisions against spalling shall be provided by U shaped or hooped stirrups spaced not to exceed the depth of the member with a clear cover of 1 inch.
- h. Prestressed slabs shall have a thickness not less than that required in Table 721.1(3) for the respective fire resistance time period.
- i. Fire coverage and end anchorages shall be as follows: Cover to the prestressing steel at the anchor shall be ½ inch greater than that required away from the anchor. Minimum cover to steel bearing plate shall be 1 inch in beams and ¾ inch in slabs.
- j. For beam widths between 8 inches and 12 inches, cover thickness shall be permitted to be determined by interpolation.
- k. Interior spans of continuous slabs, beams and girders shall be permitted to be considered restrained.
- l. For use with concrete slabs having a comparable fire endurance where members are framed into the structure in such a manner as to provide equivalent performance to that of monolithic concrete construction.
- m. Generic fire resistance ratings (those not designated as PROPRIETARY\* in the listing) in GA 600 shall be accepted as if herein listed.
- n. No additional insulating material is required on the exposed outside face of the column flange to achieve a 1 hour fire resistance rating.

**TABLE 721.1(2)**  
**RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS<sup>a, b, p</sup>**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
1. Brick of clay or shale	1-1.1	Solid brick of clay or shale <sup>c</sup> .	6	4.9	3.8	2.7
	1-1.2	Hollow brick, not filled.	5.0	4.3	3.4	2.3
	1-1.3	Hollow brick unit wall, grout or filled with perlite vermiculite or expanded shale aggregate.	6.6	5.5	4.4	3.0
	1-2.1	4" nominal thick units at least 75 percent solid backed with a hat-shaped metal furring channel $\frac{3}{4}$ " thick formed from 0.021" sheet metal attached to the brick wall on 24" centers with approved fasteners, and $\frac{1}{2}$ " Type X gypsum wallboard attached to the metal furring strips with 1"-long Type S screws spaced 8" on center.	—	—	5 <sup>d</sup>	—
2. Combination of clay brick and load-bearing hollow clay tile	2-1.1	4" solid brick and 4" tile (at least 40 percent solid).	—	8	—	—
	2-1.2	4" solid brick and 8" tile (at least 40 percent solid).	12	—	—	—
3. Concrete masonry units	3-1.1 <sup>f, g</sup>	Expanded slag or pumice.	4.7	4.0	3.2	2.1
	3-1.2 <sup>f, g</sup>	Expanded clay, shale or slate.	5.1	4.4	3.6	2.6
	3-1.3 <sup>f</sup>	Limestone, cinders or air-cooled slag.	5.9	5.0	4.0	2.7
	3-1.4 <sup>f, g</sup>	Calcareous or siliceous gravel.	6.2	5.3	4.2	2.8
4. Solid concrete <sup>h, i</sup>	4-1.1	Siliceous aggregate concrete.	7.0	6.2	5.0	3.5
		Carbonate aggregate concrete.	6.6	5.7	4.6	3.2
		Sand-lightweight concrete.	5.4	4.6	3.8	2.7
		Lightweight concrete.	5.1	4.4	3.6	2.5
5. Glazed or unglazed facing tile, nonload-bearing	5-1.1	One 2" unit cored 15 percent maximum and one 4" unit cored 25 percent maximum with $\frac{3}{4}$ " mortar-filled collar joint. Unit positions reversed in alternate courses.	—	6 $\frac{3}{8}$	—	—
	5-1.2	One 2" unit cored 15 percent maximum and one 4" unit cored 40 percent maximum with $\frac{3}{4}$ " mortar-filled collar joint. Unit positions side with $\frac{3}{4}$ " gypsum plaster. Two wythes tied together every fourth course with No. 22 gage corrugated metal ties.	—	6 $\frac{3}{4}$	—	—
	5-1.3	One unit with three cells in wall thickness, cored 29 percent maximum.	—	—	6	—
	5-1.4	One 2" unit cored 22 percent maximum and one 4" unit cored 41 percent maximum with $\frac{1}{4}$ " mortar-filled collar joint. Two wythes tied together every third course with 0.030" (No. 22 galvanized sheet steel gage) corrugated metal ties.	—	—	6	—
	5-1.5	One 4" unit cored 25 percent maximum with $\frac{3}{4}$ " gypsum plaster on one side.	—	—	4 $\frac{3}{4}$	—
	5-1.6	One 4" unit with two cells in wall thickness, cored 22 percent maximum.	—	—	—	4
	5-1.7	One 4" unit cored 30 percent maximum with $\frac{3}{4}$ " vermiculite gypsum plaster on one side.	—	—	4 $\frac{1}{2}$	—
	5-1.8	One 4" unit cored 39 percent maximum with $\frac{3}{4}$ " gypsum plaster on one side.	—	—	—	4 $\frac{1}{2}$

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(2)—continued  
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
6. Solid gypsum plaster	6-1.1	$\frac{3}{4}$ " by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with 2.6-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 <sup>d</sup>
	6-1.2	$\frac{3}{4}$ " by 0.05" (No. 16 carbon sheet steel gage) cold-rolled channels 16" on center with metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Perlite or vermiculite gypsum plaster each side. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to $2\frac{1}{2}$ cubic feet of aggregate for the 1-hour system.	—	—	$2\frac{1}{2}$ <sup>d</sup>	2 <sup>d</sup>
	6-1.3	$\frac{3}{4}$ " by 0.055" (No. 16 carbon sheet steel gage) vertical cold-rolled channels, 16" on center with $\frac{3}{8}$ " gypsum lath applied to one face and attached with sheet metal clips. Gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 <sup>d</sup>
	6-2.1	Studless with $\frac{1}{2}$ " full-length plain gypsum lath and gypsum plaster each side. Plaster mixed 1:1 for scratch coat and 1:2 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	2 <sup>d</sup>
	6-2.2	Studless with $\frac{1}{2}$ " full-length plain gypsum lath and perlite or vermiculite gypsum plaster each side.	—	—	$2\frac{1}{2}$ <sup>d</sup>	2 <sup>d</sup>
	6-2.3	Studless partition with $\frac{3}{8}$ " rib metal lath installed vertically adjacent edges tied 6" on center with No. 18 gage wire ties, gypsum plaster each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	2 <sup>d</sup>
7. Solid perlite and Portland cement	7-1.1	Perlite mixed in the ratio of 3 cubic feet to 100 pounds of Portland cement and machine applied to stud side of $1\frac{1}{2}$ " mesh by 0.058-inch (No. 17 B.W. gage) paper-backed woven wire fabric lath wire-tied to 4"-deep steel trussed wire studs 16" on center. Wire ties of 0.049" (No. 18 B.W. gage) galvanized steel wire 6" on center vertically.	—	—	$3\frac{1}{8}$ <sup>d</sup>	—
8. Solid neat wood fibered gypsum plaster	8-1.1	$\frac{3}{4}$ " by 0.055-inch (No. 16 carbon sheet steel gage) cold-rolled channels, 12" on center with 2.5-pound flat metal lath applied to one face and tied with 0.049" (No. 18 B.W. gage) wire at 6" spacing. Neat gypsum plaster applied each side.	—	—	2 <sup>d</sup>	—
9. Solid wall-board partition	9-1.1	One full-length layer $\frac{1}{2}$ " Type X gypsum wallboard <sup>e</sup> laminated to each side of 1" full-length V-edge gypsum coreboard with approved laminating compound. Vertical joints of face layer and coreboard staggered at least 3".	—	—	2 <sup>d</sup>	—
10. Hollow (studless) gypsum wallboard partition	10-1.1	One full-length layer of $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> attached to both sides of wood or metal top and bottom runners laminated to each side of 1"×6" full-length gypsum coreboard ribs spaced 2" on center with approved laminating compound. Ribs centered at vertical joints of face plies and joints staggered 24" in opposing faces. Ribs may be recessed 6" from the top and bottom.	—	—	—	$2\frac{1}{4}$ <sup>d</sup>
	10-1.2	1" regular gypsum V-edge full-length backing board attached to both sides of wood or metal top and bottom runners with nails or $1\frac{5}{8}$ " drywall screws at 24" on center. Minimum width of rumors $1\frac{5}{8}$ ". Face layer of $\frac{1}{2}$ " regular full-length gypsum wallboard laminated to outer faces of backing board with approved laminating compound.	—	—	$4\frac{5}{8}$ <sup>d</sup>	—

(continued)

**TABLE 721.1(2) —continued**  
**RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS<sup>a, o, p</sup>**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
11. Noncombustible studs-interior partition with plaster each side	11-1.1	3 $\frac{1}{4}$ " × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 24" on center. 5/8" gypsum plaster on metal lath each side mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	4 $\frac{3}{4}$ <sup>d</sup>
	11-1.2	3 $\frac{3}{8}$ " × 0.055" (No. 16 carbon sheet steel gage) approved nailable <sup>k</sup> studs spaced 24" on center. 5/8" neat gypsum wood-fibered plaster each side over 3/8" rib metal lath nailed to studs with 6d common nails, 8" on center. Nails driven 1 $\frac{1}{4}$ " and bent over.	—	—	5 $\frac{5}{8}$	—
	11-1.3	4" × 0.044" (No. 18 carbon sheet steel gage) channel-shaped steel studs at 16" on center. On each side approved resilient clips pressed onto stud flange at 16" vertical spacing, 1/4" pencil rods snapped into or wire tied onto outer loop of clips, metal lath wire-tied to pencil rods at 6" intervals, 1" perlite gypsum plaster, each side.	—	7 $\frac{5}{8}$ <sup>d</sup>	—	—
	11-1.4	2 $\frac{1}{2}$ " × 0.044" (No. 18 carbon sheet steel gage) steel studs spaced 16" on center. Wood fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied on 3/4-pound metal lath wire tied to studs, each side. 3/4" plaster applied over each face, including finish coat.	—	—	4 $\frac{1}{4}$ <sup>d</sup>	—
12. Wood studs interior partition with plaster each side	12-1.1 <sup>l, m</sup>	2" × 4" wood studs 16" on center with 5/8" gypsum plaster on metal lath. Lath attached by 4d common nails bent over or No. 14 gage by 1 $\frac{1}{4}$ " by 3/4" crown width staples spaced 6" on center. Plaster mixed 1:1 $\frac{1}{2}$ for scratch coat and 1:3 for brown coat, by weight, gypsum to sand aggregate.	—	—	—	5 $\frac{1}{8}$
	12-1.2 <sup>l</sup>	2" × 4" wood studs 16" on center with metal lath and 7/8" neat wood-fibered gypsum plaster each side. Lath attached by 6d common nails, 7" on center. Nails driven 1 $\frac{1}{4}$ " and bent over.	—	—	5 $\frac{1}{2}$ <sup>d</sup>	—
	12-1.3 <sup>l</sup>	2" × 4" wood studs 16" on center with 3/8" perforated or plain gypsum lath and 1/2" gypsum plaster each side. Lath nailed with 1 $\frac{1}{8}$ " by No. 13 gage by 19/64" head plasterboard blued nails, 4" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 $\frac{1}{4}$
	12-1.4 <sup>l</sup>	2" × 4" wood studs 16" on center with 3/8" Type X gypsum lath and 1/2" gypsum plaster each side. Lath nailed with 1 $\frac{1}{8}$ " by No. 13 gage by 19/64" head plasterboard blued nails, 5" on center. Plaster mixed 1:2 by weight, gypsum to sand aggregate.	—	—	—	5 $\frac{1}{4}$
13. Noncombustible studs-interior partition with gypsum wallboard each side	13-1.1	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 24" on center with one full-length layer of 5/8" Type X gypsum wallboard <sup>e</sup> applied vertically attached with 1" long No. 6 drywall screws to each stud. Screws are 8" on center around the perimeter and 12" on center on the intermediate stud. The wallboard may be applied horizontally when attached to 3 $\frac{5}{8}$ " studs and the horizontal joints are staggered with those on the opposite side. Screws for the horizontal application shall be 8" on center at vertical edges and 12" on center at intermediate studs.	—	—	—	2 $\frac{7}{8}$ <sup>d</sup>
	13-1.2	0.018" (No. 25 carbon sheet steel gage) channel-shaped studs 25" on center with two full-length layers of 1/2" Type X gypsum wallboard <sup>e</sup> applied vertically each side. First layer attached with 1"-long, No. 6 drywall screws, 8" on center around the perimeter and 12" on center on the intermediate stud. Second layer applied with vertical joints offset one stud space from first layer using 1 $\frac{5}{8}$ " long, No. 6 drywall screws spaced 9" on center along vertical joints, 12" on center at intermediate studs and 24" on center along top and bottom runners.	—	—	3 $\frac{5}{8}$ <sup>d</sup>	—
	13-1.3	0.055" (No. 16 carbon sheet steel gage) approved nailable metal studs <sup>e</sup> 24" on center with full-length 5/8" Type X gypsum wallboard <sup>e</sup> applied vertically and nailed 7" on center with 6d cement-coated common nails. Approved metal fastener grips used with nails at vertical butt joints along studs.	—	—	—	4 $\frac{7}{8}$

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(2)—continued  
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
14. Wood studs-interior partition with gypsum wallboard each side	14-1.1 <sup>h, m</sup>	2" × 4" wood studs 16" on center with two layers of $\frac{3}{8}$ " regular gypsum wallboard <sup>e</sup> each side, 4d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 8" on center first layer, 5d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 8" on center second layer with laminating compound between layers, joints staggered. First layer applied full length vertically, second layer applied horizontally or vertically.	—	—	—	5
	14-1.2 <sup>l, m</sup>	2" × 4" wood studs 16" on center with two layers $\frac{1}{2}$ " regular gypsum wallboard <sup>e</sup> applied vertically or horizontally each side <sup>k</sup> , joints staggered. Nail base layer with 5d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 8" on center face layer with 8d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 8" on center.	—	—	—	5 $\frac{1}{2}$
	14-1.3 <sup>l, m</sup>	2" × 4" wood studs 24" on center with $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> applied vertically or horizontally nailed with 6d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 7" on center with end joints on nailing members. Stagger joints each side.	—	—	—	4 $\frac{3}{4}$
	14-1.4 <sup>l</sup>	2" × 4" fire-retardant-treated wood studs spaced 24" on center with one layer of $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> applied with face paper grain (long dimension) parallel to studs. Wallboard attached with 6d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 7" on center.	—	—	—	4 $\frac{3}{4}$ <sup>d</sup>
	14-1.5 <sup>l, m</sup>	2" × 4" wood studs 16" on center with two layers $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> each side. Base layers applied vertically and nailed with 6d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 9" on center. Face layer applied vertically or horizontally and nailed with 8d cooler <sup>n</sup> or wallboard <sup>n</sup> nails at 7" on center. For nail-adhesive application, base layers are nailed 6" on center. Face layers applied with coating of approved wallboard adhesive and nailed 12" on center.	—	—	6	—
	14-1.6 <sup>l</sup>	2" × 3" fire-retardant-treated wood studs spaced 24" on center with one layer of $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> applied with face paper grain (long dimension) at right angles to studs. Wallboard attached with 6d cement-coated box nails spaced 7" on center.	—	—	—	3 $\frac{5}{8}$ <sup>d</sup>
15. Exterior or interior walls (continued)	15-1.1 <sup>l, m</sup>	Exterior surface with $\frac{3}{4}$ " drop siding over $\frac{1}{2}$ " gypsum sheathing on 2" × 4" wood studs at 16" on center, interior surface treatment as required for 1-hour-rated exterior or interior 2" × 4" wood stud partitions. Gypsum sheathing nailed with $1\frac{3}{4}$ " by No. 11 gage by $\frac{7}{16}$ " head galvanized nails at 8" on center. Siding nailed with 7d galvanized smooth box nails.	—	—	—	Varies
	15-1.2 <sup>l, m</sup>	2" × 4" wood studs 16" on center with metal lath and $\frac{3}{4}$ " cement plaster on each side. Lath attached with 6d common nails 7" on center driven to 1" minimum penetration and bent over. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	5 $\frac{3}{8}$
	15-1.3 <sup>l, m</sup>	2" × 4" wood studs 16" on center with $\frac{7}{8}$ " cement plaster (measured from the face of studs) on the exterior surface with interior surface treatment as required for interior wood stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies
	15-1.4	$\frac{5}{8}$ " No. 16 gage noncombustible studs 16" on center with $\frac{7}{8}$ " cement plaster (measured from the face of the studs) on the exterior surface with interior surface treatment as required for interior, nonbearing, noncombustible stud partitions in this table. Plaster mix 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.	—	—	—	Varies <sup>d</sup>

(continued)

**TABLE 721.1(2)—continued**  
**RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
15. Exterior or interior walls (continued)	15-1.5 <sup>m</sup>	2 <sup>1/4</sup> " × 3 <sup>3/4</sup> " clay face brick with cored holes over 1/2" gypsum sheathing on exterior surface of 2" × 4" wood studs at 16" on center and two layers 5/8" Type X gypsum wallboard <sup>e</sup> on interior surface. Sheathing placed horizontally or vertically with vertical joints over studs nailed 6" on center with 1 <sup>3/4</sup> " × No. 11 gage by 7/16" head galvanized nails. Inner layer of wallboard placed horizontally or vertically and nailed 8" on center with 6d cooler <sup>n</sup> or wallboard <sup>n</sup> nails. Outer layer of wallboard placed horizontally or vertically and nailed 8" on center with 8d cooler <sup>n</sup> or wallboard <sup>n</sup> nails. All joints staggered with vertical joints over studs. Outer layer joints taped and finished with compound. Nail heads covered with joint compound. 0.035 inch (No. 20 galvanized sheet gage) corrugated galvanized steel wall ties 3/4" by 6 <sup>5/8</sup> " attached to each stud with two 8d cooler <sup>n</sup> or wallboard <sup>n</sup> nails every sixth course of bricks.	—	—	10	—
	15-1.6 <sup>l,m</sup>	2" × 6" fire-retardant-treated wood studs 16" on center. Interior face has two layers of 5/8" Type X gypsum with the base layer placed vertically and attached with 6d box nails 12" on center. The face layer is placed horizontally and attached with 8d box nails 8" on center at joints and 12" on center elsewhere. The exterior face has a base layer of 5/8" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by self-furred exterior lath attached with 2 <sup>1/2</sup> ", No. 12 gage galvanized roofing nails with a <sup>3/8</sup> " diameter head and spaced 6" on center along each stud. Cement plaster consisting of a <sup>1/2</sup> " brown coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat.	—	—	8 <sup>1/4</sup>	—
	15-1.7 <sup>l,m</sup>	2" × 6" wood studs 16" on center. The exterior face has a layer of 5/8" Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1" by No. 18 gage self-furred exterior lath attached with 8d by 2 <sup>1/2</sup> " long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a <sup>1/2</sup> " scratch coat, a bonding agent and a <sup>1/2</sup> " brown coat and a finish coat is then applied. The scratch coat is mixed in the proportion of 1:3 by weight, cement to sand with 10 pounds of hydrated lime and 3 pounds of approved additives or admixtures per sack of cement. The brown coat is mixed in the proportion of 1:4 by weight, cement to sand with the same amounts of hydrated lime and approved additives or admixtures used in the scratch coat. The interior is covered with 3/8" gypsum lath with 1" hexagonal mesh of 0.035 inch (No. 20 B.W. gage) woven wire lath furred out 5/16" and 1" perlite or vermiculite gypsum plaster. Lath nailed with 1 <sup>1/8</sup> " by No. 13 gage by 19/64" head plasterboard glued nails spaced 5" on center. Mesh attached by 1 <sup>3/4</sup> " by No. 12 gage by 3/8" head nails with 3/8" furring, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to 2 <sup>1/2</sup> cubic feet of aggregate.	—	—	8 <sup>3/8</sup>	—

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(2)—continued  
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
	15-1.8 <sup>l,m</sup>	2" × 6" wood studs 16" on center. The exterior face has a layer of $\frac{5}{8}$ " Type X gypsum sheathing placed vertically with 6d box nails 8" on center at joints and 12" on center elsewhere. An approved building paper is next applied, followed by 1 $\frac{1}{2}$ " by No. 17 gage self-furred exterior lath attached with 8d by 2 $\frac{1}{2}$ " long galvanized roofing nails spaced 6" on center along each stud. Cement plaster consisting of a $\frac{1}{2}$ " scratch coat, and a $\frac{1}{2}$ " brown coat is then applied. The plaster may be placed by machine. The scratch coat is mixed in the proportion of 1:4 by weight, plastic cement to sand. The brown coat is mixed in the proportion of 1:5 by weight, plastic cement to sand. The interior is covered with $\frac{3}{8}$ " gypsum lath with 1" hexagonal mesh of No. 20 gage woven wire lath furred out $\frac{5}{16}$ " and 1" perlite or vermiculite gypsum plaster. Lath nailed with 1 $\frac{1}{8}$ " by No. 13 gage by $\frac{19}{64}$ " head plasterboard glued nails spaced 5" on center. Mesh attached by 1 $\frac{3}{4}$ " by No. 12 gage by $\frac{3}{8}$ " head nails with $\frac{3}{8}$ " furrings, spaced 8" on center. The plaster mix shall not exceed 100 pounds of gypsum to 2 $\frac{1}{2}$ cubic feet of aggregate.	—	—	8 $\frac{3}{8}$	—
	15-1.9	4" No. 18 gage, nonload-bearing metal studs, 16" on center, with 1" Portland cement lime plaster [measured from the back side of the $\frac{3}{4}$ -pound expanded metal lath] on the exterior surface. Interior surface to be covered with 1" of gypsum plaster on $\frac{3}{4}$ -pound expanded metal lath proportioned by weight-1:2 for scratch coat, 1:3 for brown, gypsum to sand. Lath on one side of the partition fastened to $\frac{1}{4}$ " diameter pencil rods supported by No. 20 gage metal clips, located 16" on center vertically, on each stud. 3" thick mineral fiber insulating batts friction fitted between the studs.	—	—	6 $\frac{1}{2}$ <sup>d</sup>	—
15. Exterior or interior walls (continued)	15-1.10	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, with $\frac{1}{2}$ " Glass Fiber Reinforced Concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $\frac{1}{2}$ "-long flare-bevel welds, and 4" foot attached to the GFRC skin with $\frac{5}{8}$ " thick GFRC bonding pads that extend 2 $\frac{1}{2}$ " beyond the flex anchor foot on both sides. Interior surface to have two layers of $\frac{1}{2}$ " Type X gypsum wallboard. <sup>e</sup> The first layer of wallboard to be attached with 1"-long Type S buglehead screws spaced 24" on center and the second layer is attached with 1 $\frac{5}{8}$ "-long Type S screws spaced at 12" on center. Cavity is to be filled with 5" of 4pcf (nominal) mineral fiber batts. GFRC has 1 $\frac{1}{2}$ " returns packed with mineral fiber and caulked on the exterior.	—	—	6 $\frac{1}{2}$	—
	15-1.11	Steel studs 0.060" thick, 4" deep or 6" at 16" or 24" centers, respectively, with $\frac{1}{2}$ " Glass Fiber Reinforced Concrete (GFRC) on the exterior surface. GFRC is attached with flex anchors at 24" on center, with 5" leg welded to studs with two $\frac{1}{2}$ "-long flare-bevel welds, and 4" foot attached to the GFRC skin with $\frac{5}{8}$ " -thick GFRC bonding pads that extend 2 $\frac{1}{2}$ " beyond the flex anchor foot on both sides. Interior surface to have one layer of $\frac{5}{8}$ " Type X gypsum wallboard <sup>e</sup> , attached with 1 $\frac{1}{4}$ "-long Type S buglehead screws spaced 12" on center. Cavity is to be filled with 5" of 4pcf (nominal) mineral fiber batts. GFRC has 1 $\frac{1}{2}$ " returns packed with mineral fiber and caulked on the exterior.	—	—	—	6 $\frac{1}{8}$
	15-1.12 <sup>g</sup>	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $\frac{5}{8}$ " Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 $\frac{1}{4}$ " Type S drywall screws, spaced 12" on center. Cavity to be filled with 5 $\frac{1}{2}$ " mineral wool insulation.	—	—	—	6 $\frac{3}{4}$

(continued)

**TABLE 721.1(2)—continued**  
**RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
15. Exterior or interior walls (continued)	15-1.13 <sup>d</sup>	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $\frac{5}{8}$ " Type X gypsum wallboard, 4' wide, applied vertically with all joints over framing or blocking and fastened with 2 $\frac{1}{4}$ " Type S drywall screws, spaced 12" on center. R-19 mineral fiber insulation installed in stud cavity.	—	—	—	6 $\frac{3}{4}$
	15-1.14 <sup>d</sup>	2" × 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $\frac{5}{8}$ " Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 $\frac{1}{4}$ " Type S drywall screws, spaced 7" on center.	—	—	—	6 $\frac{3}{4}$
	15-1.15 <sup>d</sup>	2" × 4" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with $\frac{5}{8}$ " Type X gypsum wallboard and sheathing, respectively, 4' wide, applied horizontally or vertically with vertical joints over studs, and fastened with 2 $\frac{1}{4}$ " Type S drywall screws, spaced 12" on center. Cavity to be filled with 3 $\frac{1}{2}$ " mineral wool insulation.	—	—	—	4 $\frac{3}{4}$
	15-1.16 <sup>d</sup>	2" × 6" wood studs at 24" centers with double top plates, single bottom plate; interior and exterior side covered with two layers of $\frac{5}{8}$ " Type X gypsum wallboard, 4' wide, applied horizontally with vertical joints over studs. Base layer fastened with 2 $\frac{1}{4}$ " Type S drywall screws, spaced 24" on center and face layer fastened with Type S drywall screws, spaced 8" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with 5 $\frac{1}{2}$ " mineral wool insulation.	—	—	8	—
	15-2.1 <sup>d</sup>	3 $\frac{5}{8}$ " No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $\frac{3}{4}$ " thick Portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C 1088, Grade TBS or better, installed in running bond in accordance with Section 1405.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than 1 $\frac{3}{4}$ ". Interior side covered with one layer of $\frac{5}{8}$ " thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.	—	—	—	6
	15-2.2 <sup>d</sup>	3 $\frac{5}{8}$ " No. 16 gage steel studs at 24" on center or 2" × 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum $\frac{3}{4}$ " thick Portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C 1088, Grade TBS or better, installed in running bond in accordance with Section 1405.10. Combined total thickness of the Portland cement plaster, mortar and thin veneer brick units shall be not less than 2". Interior side covered with two layers of $\frac{5}{8}$ " thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 $\frac{5}{8}$ " long No. 6 drywall screws at 12" on center.	—	—	6 $\frac{7}{8}$	—
	15-2.3 <sup>d</sup>	3 $\frac{5}{8}$ " No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than 2 $\frac{5}{8}$ " thick complying with ASTM C 216 installed in accordance with Section 1405.6 with a minimum 1" air space. Interior side covered with one layer of $\frac{5}{8}$ " thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.	—	—	—	7 $\frac{7}{8}$

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(2)—continued  
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS <sup>a, o, p</sup>

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE <sup>b</sup> (inches)			
			4 hours	3 hours	2 hours	1 hour
15. Exterior or interior walls	15-2.4 <sup>d</sup>	3 <sup>5/8</sup> " No. 16 gage steel studs at 16" on center or 2" × 4" wood studs at 16" on center. Where metal lath is used, attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than 2 <sup>5/8</sup> " thick complying with ASTM C 216 installed in accordance with Section 1405.6 with a minimum 1" air space. Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 <sup>5/8</sup> " long No. 6 drywall screws at 12" on center.	—	—	8 <sup>1/2</sup>	—
	16-1.1 <sup>q</sup>	2" × 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with 5/8" Type X gypsum wallboard, 4" wide, applied horizontally unblocked, and fastened with 2 <sup>1/4</sup> " Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with 3/8" wood structural panels, applied vertically, horizontal joints blocked and fastened with 6d common nails (bright) — 12" on center in the field, and 6" on center panel edges. Cavity to be filled with 3 <sup>1/2</sup> " mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	4 <sup>1/2</sup>
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 705.5.	16-1.2 <sup>q</sup>	2" × 6" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with 7/8" Type X gypsum wallboard, 4" wide, applied horizontally or vertically with vertical joints over studs and fastened with 2 <sup>1/4</sup> " Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with 7/16" wood structural panels fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with 5 <sup>1/2</sup> " mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	6 <sup>9/16</sup>
	16-1.3 <sup>q</sup>	2" × 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with 5/8" Type X gypsum wallboard, 4" wide, applied vertically with all joints over framing or blocking and fastened with 2 <sup>1/4</sup> " Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with 3/8" wood structural panels, applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 mineral fiber insulation installed in stud cavity. Rating established from the gypsum-covered side only.	—	—	—	6 <sup>1/2</sup>

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm<sup>2</sup>, 1 cubic foot = 0.0283 m<sup>3</sup>.

- a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.
- b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone treated perlite loose fill insulation; vermiculite loose fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness may also include the thickness of applied plaster and lath or gypsum wallboard, where specified.
- c. For units in which the net cross sectional area of cored brick in any plane parallel to the surface containing the cores is at least 75 percent of the gross cross sectional area measured in the same plane.
- d. Shall be used for nonbearing purposes only.
- e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with a minimum of 1/16 inch gypsum veneer plaster.
- f. The fire resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2 hour fire resistance rating in Item 3, and having a thickness of not less than 7<sup>5/8</sup> inches is 4 hours when cores which are not grouted are filled with silicone treated perlite loose fill insulation; vermiculite loose fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of 3/8 inch.
- g. The fire resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

(continued)

**TABLE 721.1(2)—continued**  
**RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS<sup>a, b</sup>**

- h. See also Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.
- i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.
- j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.
- k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.
- l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided the length of the fasteners used to attach the fire protection is increased by an amount at least equal to the thickness of the wood structural panel.
- m. For studs with a slenderness ratio,  $l_{ed}/d$ , greater than 33, the design stress shall be reduced to 78 percent of allowable  $F'_c$ . For studs with a slenderness ratio,  $l_{ed}/d$ , not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress  $F'_c$  calculated for studs having a slenderness ratio  $l_{ed}/d$  of 33.
- n. For properties of cooler or wallboard nails, see ASTM C 514, ASTM C 547 or ASTM F 1667.
- o. Generic fire resistance ratings (those not designated as PROPRIETARY\* in the listing) in the GA 600 shall be accepted as if herein listed.
- p. NCMA TEK 5 8A shall be permitted for the design of fire walls.
- q. The design stress of studs shall be equal to a maximum of 100 percent of the allowable  $F'_c$  calculated in accordance with Section 2306.

**TABLE 721.1(3)**  
**MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
1. Siliceous aggregate concrete	1-1.1		7.0	6.2	5.0	3.5	—	—	—	—
2. Carbonate aggregate concrete	2-1.1		6.6	5.7	4.6	3.2	—	—	—	—
3. Sand-light-weight concrete	3-1.1	Slab (no ceiling required). Minimum cover over nonpre-stressed reinforcement shall not be less than $\frac{3}{4}$ " <sup>b</sup> .	5.4	4.6	3.8	2.7	—	—	—	—
4. Lightweight concrete	4-1.1		5.1	4.4	3.6	2.5	—	—	—	—
	5-1.1	Slab with suspended ceiling of vermiculite gypsum plaster over metal lath attached to $\frac{3}{4}$ " cold-rolled channels spaced 12" on center. Ceiling located 6" minimum below joists.	3	2	—	—	1	$\frac{3}{4}$	—	—
5. Reinforced concrete	5-2.1	$\frac{3}{8}$ " Type X gypsum wallboard <sup>c</sup> attached to 0.018 inch (No. 25 carbon sheet steel gage) by $\frac{7}{8}$ " deep by $2\frac{5}{8}$ " hat-shaped galvanized steel channels with 1"-long No. 6 screws. The channels are spaced 24" on center, span 35" and are supported along their length at 35" intervals by 0.033" (No. 21 galvanized sheet gage) galvanized steel flat strap hangers having formed edges that engage the lips of the channel. The strap hangers are attached to the side of the concrete joists with $\frac{5}{32}$ " by $1\frac{1}{4}$ " long power-driven fasteners. The wallboard is installed with the long dimension perpendicular to the channels. All end joints occur on channels and supplementary channels are installed parallel to the main channels, 12" each side, at end joint occurrences. The finished ceiling is located approximately 12" below the soffit of the floor slab.	—	—	$2\frac{1}{2}$	—	—	$\frac{5}{8}$	—	

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(3)—continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
6. Steel joists constructed with a poured reinforced concrete slab on metal lath forms or steel form units <sup>d, e</sup>	6-1.1	Gypsum plaster on metal lath attached to the bottom chord with single No. 16 gage or doubled No. 18 gage wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 2-hour system. For 3-hour system plaster is neat.	—	—	2 $\frac{1}{2}$	2 $\frac{1}{4}$	—	—	$\frac{3}{4}$	$\frac{5}{8}$
	6-2.1	Vermiculite gypsum plaster on metal lath attached to the bottom chord with single No. 16 gage or doubled 0.049-inch (No. 18 B.W. gage) wire ties 6" on center.	—	2	—	—	—	$\frac{5}{8}$	—	—
	6-3.1	Cement plaster over metal lath attached to the bottom chord of joists with single No. 16 gage or doubled 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat for 1-hour system and 1:1 for scratch coat, 1:1 $\frac{1}{2}$ for brown coat for 2-hour system, by weight, cement to sand.	—	—	—	2	—	—	—	$\frac{5}{8}$ <sup>f</sup>
	6-4.1	Ceiling of $\frac{5}{8}$ " Type X wallboard <sup>c</sup> attached to $\frac{7}{8}$ " deep by $2\frac{5}{8}$ " by 0.021 inch (No. 25 carbon sheet steel gage) hat-shaped furring channels 12" on center with 1" long No. 6 wallboard screws at 8" on center. Channels wire tied to bottom chord of joists with doubled 0.049 inch (No. 18 B.W. gage) wire or suspended below joists on wire hangers. <sup>g</sup>	—	—	2 $\frac{1}{2}$	—	—	—	$\frac{5}{8}$	—
	6-5.1	Wood-fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied over metal lath. Lath tied 6" on center to $\frac{3}{4}$ " channels spaced $13\frac{1}{2}$ " on center. Channels secured to joists at each intersection with two strands of 0.049 inch (No. 18 B.W. gage) galvanized wire.	—	—	2 $\frac{1}{2}$	—	—	—	$\frac{3}{4}$	—
7. Reinforced concrete slabs and joists with hollow clay tile fillers laid end to end in rows $2\frac{1}{2}$ " or more apart; reinforcement placed between rows and concrete cast around and over tile.	7-1.1	$\frac{5}{8}$ " gypsum plaster on bottom of floor or roof construction.	—	—	8 <sup>h</sup>	—	—	—	$\frac{5}{8}$	—
	7-1.2	None	—	—	—	5 $\frac{1}{2}$ <sup>i</sup>	—	—	—	—
8. Steel joists constructed with a reinforced concrete slab on top poured on a $\frac{1}{2}$ " deep steel deck. <sup>e</sup>	8-1.1	Vermiculite gypsum plaster on metal lath attached to $\frac{3}{4}$ " cold-rolled channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center.	2 $\frac{1}{2}$ <sup>j</sup>	—	—	—	$\frac{3}{4}$	—	—	—

(continued)

**TABLE 721.1(3)—continued**  
**MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (Inches)				MINIMUM THICKNESS OF CEILING (Inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
9. 3" deep cellular steel deck with concrete slab on top. Slab thickness measured to top.	9-1.1	Suspended ceiling of vermiculite gypsum plaster base coat and vermiculite acoustical plaster on metal lath attached at 6" intervals to $\frac{3}{4}$ " cold-rolled channels spaced 12" on center and secured to $1\frac{1}{2}$ " cold-rolled channels spaced 36" on center with 0.065" (No. 16 B.W. gage) wire. $1\frac{1}{2}$ " channels supported by No. 8 gage wire hangers at 36" on center. Beams within envelope and with a $2\frac{1}{2}$ " airspace between beam soffit and lath have a 4-hour rating.	$2\frac{1}{2}$	—	—	—	$1\frac{1}{8}$ <sup>k</sup>	—	—	—
10. $1\frac{1}{2}$ "-deep steel roof deck on steel framing. Insulation board, 30 pcf density, composed of wood fibers with cement binders of thickness shown bonded to deck with unified asphalt adhesive. Covered with a Class A or B roof covering.	10-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to $\frac{3}{4}$ " furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. $\frac{3}{4}$ " channel saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2" channels spaced 36" on center suspended 2" below steel framing and saddle-tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	$1\frac{7}{8}$	1	—	—	$\frac{3}{4}$ <sup>l</sup>	$\frac{3}{4}$ <sup>l</sup>
11. $1\frac{1}{2}$ "-deep steel roof deck on steel-framing wood fiber insulation board, 17.5 pcf density on top applied over a 15-lb asphalt-saturated felt. Class A or B roof covering.	11-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to $\frac{3}{4}$ " furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. $\frac{3}{4}$ " channels saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2" channels spaced 36" on center suspended 2" below steel framing and saddle tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 1-hour system. For 2-hour system, plaster mix is 1:2 by weight, gypsum-to-sand aggregate.	—	—	$1\frac{1}{2}$	1	—	—	$\frac{7}{8}$ <sup>g</sup>	$\frac{3}{4}$ <sup>l</sup>

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(3)—continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, b</sup>

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
12. 1½" deep steel roof deck on steel-framing insulation of rigid board consisting of expanded perlite and fibers impregnated with integral asphalt waterproofing; density 9 to 12 pcf secured to metal roof deck by ½" wide ribbons of waterproof, cold-process liquid adhesive spaced 6" apart. Steel joist or light steel construction with metal roof deck, insulation, and Class A or B built-up roof covering. <sup>e</sup>	12-1.1	Gypsum-vermiculite plaster on metal lath wire tied at 6" intervals to ¾" furring channels spaced 12" on center and wire tied to 2" runner channels spaced 32" on center. Runners wire tied to bottom chord of steel joists.	—	—	1	—	—	—	7/8	—
13. Double wood floor over wood joists spaced 16" on center. <sup>m,n</sup>	13-1.1	Gypsum plaster over ¾" Type X gypsum lath. Lath initially applied with not less than four 1⅓" by No. 13 gage by 19/64" head plasterboard blued nails per bearing. Continuous stripping over lath along all joist lines. Stripping consists of 3" wide strips of metal lath attached by 1½" by No. 11 gage by 1/2" head roofing nails spaced 6" on center. Alternate stripping consists of 3" wide 0.049" diameter wire stripping weighing 1 pound per square yard and attached by No. 16 gage by 1½" by ¾" crown width staples, spaced 4" on center. Where alternate stripping is used, the lath nailing may consist of two nails at each end and one nail at each intermediate bearing. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	—	—	—	—	—	7/8
	13-1.2	Cement or gypsum plaster on metal lath. Lath fastened with 1½" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, cement to sand aggregate.	—	—	—	—	—	—	—	5/8
	13-1.3	Perlite or vermiculite gypsum plaster on metal lath secured to joists with 1½" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center.	—	—	—	—	—	—	—	5/8
	13-1.4	1/2" Type X gypsum wallboard <sup>c</sup> nailed to joists with 5d cooler <sup>d</sup> or wallboard <sup>d</sup> nails at 6" on center. End joints of wallboard centered on joists.	—	—	—	—	—	—	—	1/2

(continued)

**TABLE 721.1(3) —continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a,q</sup>**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (Inches)				MINIMUM THICKNESS OF CEILING (Inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
14. Plywood stressed skin panels consisting of $\frac{5}{8}$ " - thick interior C-D (exterior glue) top stressed skin on 2" × 6" nominal (minimum) stringers. Adjacent panel edges joined with 8d common wire nails spaced 6" on center. Stringers spaced 12" maximum on center.	14-1.1	$\frac{1}{2}$ " -thick wood fiberboard weighing 15 to 18 pounds per cubic foot installed with long dimension parallel to stringers or $\frac{3}{8}$ " C-D (exterior glue) plywood glued and/or nailed to stringers. Nailing to be with 5d cooler <sup>o</sup> or wallboard <sup>o</sup> nails at 12" on center. Second layer of $\frac{1}{2}$ " Type X gypsum wallboard <sup>c</sup> applied with long dimension perpendicular to joists and attached with 8d cooler <sup>o</sup> or wallboard <sup>o</sup> nails at 6" on center at end joints and 8" on center elsewhere. Wallboard joints staggered with respect to fiberboard joints.	—	—	—	—	—	—	—	1
15. Vermiculite concrete slab proportioned 1:4 (Portland cement to vermiculite aggregate) on a $1\frac{1}{2}$ " -deep steel deck supported on individually protected steel framing. Maximum span of deck 6'-10" where deck is less than 0.019 inch (No. 26 carbon steel sheet gage) or greater. Slab reinforced with 4" × 8" 0.109/0.083" (No. $12/14$ B.W. gage) welded wire mesh.	15-1.1	None	—	—	—	—	3 <sup>i</sup>	—	—	—
16. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on a $1\frac{1}{4}$ " -deep steel deck supported on individually protected steel framing. Slab reinforced with 4" × 8" 0.109/0.083" (No. $12/14$ B.W. gage) welded wire mesh.	16-1.1	None	—	—	—	—	3 <sup>i,j</sup>	—	—	—

*(continued)*

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(3)—continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
17. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on a $\frac{9}{16}$ " -deep steel deck supported by steel joists 4' on center. Class A or B roof covering on top.	17-1.1	Perlite gypsum plaster on metal lath wire tied to $\frac{3}{4}$ " furring channels attached with 0.065" (No. 16 B.W. gage) wire ties to lower chord of joists.	—	2 <sup>p</sup>	2 <sup>p</sup>	—	—	$\frac{7}{8}$	$\frac{3}{4}$	—
18. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on $1\frac{1}{4}$ " -deep steel deck supported on individually protected steel framing. Maximum span of deck 6'-10" where deck is less than 0.019" (No. 26 carbon sheet steel gage) and 8'-0" where deck is 0.019" (No. 26 carbon sheet steel gage) or greater. Slab reinforced with 0.042" (No. 19 B.W. gage) hexagonal wire mesh. Class A or B roof covering on top.	18-1.1	None	—	2 $\frac{1}{4}$ <sup>p</sup>	2 $\frac{1}{4}$ <sup>p</sup>	—	—	—	—	—
19. Floor and beam construction consisting of 3" -deep cellular steel floor unit mounted on steel members with 1:4 (proportion of Portland cement to perlite aggregate) perlite-concrete floor slab on top.	19-1.1	Suspended envelope ceiling of perlite gypsum plaster on metal lath attached to $\frac{3}{4}$ " cold-rolled channels, secured to $1\frac{1}{2}$ " cold-rolled channels spaced 42" on center supported by 0.203 inch (No. 6 B.W. gage) wire 36" on center. Beams in envelope with 3" minimum airspace between beam soffit and lath have a 4-hour rating.	2 <sup>p</sup>	—	—	—	1 <sup>l</sup>	—	—	—

(continued)

**TABLE 721.1(3)—continued**  
**MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>b, q</sup>**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
20. Perlite concrete proportioned 1:6 (Portland cement to perlite aggregate) poured to $\frac{1}{8}$ " thickness above top of corrugations of $1\frac{5}{16}$ " -deep galvanized steel deck maximum span 8'-0" for 0.024" (No. 24 galvanized sheet gage) or 6?0" for 0.019" (No. 26 galvanized sheet gage) with deck supported by individually protected steel framing. Approved polystyrene foam plastic insulation board having a flame spread not exceeding 75 (1" to 4" thickness) with vent holes that approximate 3 percent of the board surface area placed on top of perlite slurry. A 2' by 4' insulation board contains six $2\frac{3}{4}$ " diameter holes. Board covered with $2\frac{1}{4}$ " minimum perlite concrete slab. Slab reinforced with mesh consisting of 0.042" (No. 19 B.W. gage) galvanized steel wire twisted together to form 2" hexagons with straight 0.065" (No. 16 B.W. gage) galvanized steel wire woven into mesh and spaced 3". Alternate slab reinforcement shall be permitted to consist of 4" x 8", 0.109/0.238" (No. 12/4 B.W. gage), or 2" x 2", 0.083/0.083" (No. 14/14 B.W. gage) welded wire fabric. Class A or B roof covering on top.	20-1.1	None	—	—	Varies	—	—	—	—	—
21. Wood joists, wood I-joists, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with $\frac{1}{2}$ " wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with 8d nails. The wood structural panel thickness shall not be less than nominal $\frac{1}{2}$ " nor less than required by Chapter 23.	21-1.1	Base layer $\frac{5}{8}$ " Type X gypsum wallboard applied at right angles to joist or truss 24" o.c. with $1\frac{1}{4}$ " Type S or Type W drywall screws 24" o.c. Face layer $\frac{5}{8}$ " Type X gypsum wallboard or veneer base applied at right angles to joist or truss through base layer with $1\frac{7}{8}$ " Type S or Type W drywall screws 12" o.c. at joints and intermediate joist or truss. Face layer Type G drywall screws placed 2" back on either side of face layer end joints, 12" o.c.	—	—	—	Varies	—	—	—	$1\frac{1}{4}$

(continued)

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(3)—continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, d</sup>

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
22. Steel joists, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with $\frac{1}{2}$ " wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with No. 8 screws. The wood structural panel thickness shall not be less than nominal $\frac{1}{2}$ " nor less than required by Chapter 23.	22-1.1	Base layer $\frac{5}{8}$ " Type X gypsum board applied at right angles to steel framing 24" on center with 1" Type S drywall screws spaced 24" on center. Face layer $\frac{5}{8}$ " Type X gypsum board applied at right angles to steel framing attached through base layer with $\frac{15}{8}$ " Type S drywall screws 12" on center at end joints and intermediate joints and $1\frac{1}{2}$ " Type G drywall screws 12 inches on center placed 2" back on either side of face layer end joints. Joints of the face layer are offset 24" from the joints of the base layer.	—	—	—	Varies	—	—	—	$1\frac{1}{4}$
23. Wood I-joist (minimum joist depth $9\frac{1}{4}$ " with a minimum flange depth of $1\frac{5}{16}$ " and a minimum flange cross-sectional area of 2.3 square inches) at 24" o.c. spacing with 1 inch by 4 inch (nominal) wood furring strip spacer applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the 1" × 4" furring strip spacer.	23-1.1	$\frac{1}{2}$ " deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by $1\frac{7}{8}$ " Type S drywall screws. $\frac{5}{8}$ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with $1\frac{1}{8}$ " Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	$\frac{5}{8}$
24. Wood I-joist (minimum I-joist depth $9\frac{1}{4}$ " with a minimum flange depth of $1\frac{1}{2}$ " and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of $\frac{3}{8}$ ") @ 24" o.c., 1 $\frac{1}{2}$ " mineral wool insulation (2.5 pcf-nominal) resting on hat-shaped furring channels.	24-1.1	Minimum 0.026" thick hat-shaped channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by $1\frac{5}{8}$ " Type S drywall screws. $\frac{5}{8}$ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with $1\frac{1}{8}$ " Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	$\frac{5}{8}$
25. Wood I-joist (minimum I-joist depth $9\frac{1}{4}$ " with a minimum flange depth of $1\frac{1}{2}$ " and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of $\frac{7}{16}$ ") @ 24" o.c., 1 $\frac{1}{2}$ " mineral wool insulation (2.5 pcf-nominal) resting on resilient channels.	25-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by $1\frac{5}{8}$ " Type S drywall screws. $\frac{5}{8}$ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	$\frac{5}{8}$

(continued)

**TABLE 721.1(3)—continued**  
**MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
26. Wood I-joist (minimum I-joist depth $9\frac{1}{4}$ " with a minimum flange thickness of $1\frac{1}{2}$ " and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of $\frac{3}{8}$ ") @ 24" o.c.	26-1.1	Two layers of $\frac{1}{2}$ " Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with $1\frac{5}{8}$ " Type S drywall screws spaced 12" o.c. and the face layer is fastened with 2" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with $1\frac{1}{2}$ " Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1
27. Wood I-joist (minimum I-joist depth $9\frac{1}{2}$ " with a minimum flange depth of $1\frac{5}{16}$ " and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of $\frac{3}{8}$ ") @ 24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by $1\frac{5}{8}$ " Type S drywall screws. Two layers of $\frac{1}{2}$ " Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with $1\frac{1}{4}$ " Type S drywall screws spaced 12" o.c. and the face layer is fastened with $1\frac{5}{8}$ " Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with $1\frac{1}{2}$ " Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

*(continued)*

FIRE AND SMOKE PROTECTION FEATURES

TABLE 721.1(3)—continued  
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a, q</sup>

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
28. Wood I-joint (minimum I-joint depth $9\frac{1}{4}$ " with a minimum flange depth of $1\frac{1}{2}$ " and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of $\frac{3}{8}$ ") @ 24" o.c. Unfaced fiberglass insulation is installed between the I-joists supported on the upper surface of the flange by stay wires spaced 12" o.c.	28-1.1	Base layer of $\frac{5}{8}$ " Type C gypsum wallboard attached directly to I-joists with $1\frac{5}{8}$ " Type S drywall screws spaced 12" o.c. with ends staggered. Minimum 0.0179" thick hat-shaped $\frac{7}{8}$ -inch furring channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by $1\frac{5}{8}$ " Type S drywall screws after the base layer of gypsum wallboard has been applied. The middle and face layers of $\frac{5}{8}$ " Type C gypsum wallboard applied perpendicular to the channel with end joints staggered. The middle layer is fastened with 1" Type S drywall screws spaced 12" o.c. The face layer is applied parallel to the middle layer but with the edge joints offset 24" from those of the middle layer and fastened with $1\frac{5}{8}$ " Type S drywall screws 8" o.c. The joints shall be taped and covered with joint compound.	—	—	—	Varies	—	—	$2\frac{3}{4}$	—
29. Channel-shaped 18 gage steel joists (minimum depth 8") spaced a maximum 24" o.c. supporting tongue-and-groove wood structural panels (nominal minimum $\frac{3}{4}$ " thick) applied perpendicular to framing members. Structural panels attached with $1\frac{5}{8}$ " Type S-12 screws spaced 12" o.c.	29-1.1	Base layer $\frac{5}{8}$ " Type X gypsum board applied perpendicular to bottom of framing members with $1\frac{1}{8}$ " Type S-12 screws spaced 12" o.c. Second layer $\frac{5}{8}$ " Type X gypsum board attached perpendicular to framing members with $1\frac{5}{8}$ " Type S-12 screws spaced 12" o.c. Second layer joints offset 24" from base layer. Third layer $\frac{5}{8}$ " Type X gypsum board attached perpendicular to framing members with $2\frac{3}{8}$ " Type S-12 screws spaced 12" o.c. Third layer joints offset 12" from second layer joints. Hat-shaped $\frac{7}{8}$ -inch rigid furring channels applied at right angles to framing members over third layer with two $2\frac{3}{8}$ " Type S-12 screws at each framing member. Face layer $\frac{5}{8}$ " Type X gypsum board applied at right angles to furring channels with $1\frac{1}{8}$ " Type S screws spaced 12" o.c.	—	—	Varies	—	—	—	$3\frac{3}{8}$	—

(continued)

**TABLE 721.1(3)—continued**  
**MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS<sup>a,q</sup>**

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m<sup>3</sup>,  
 1 pound per square inch = 6.895 kPa, 1 pound per linear foot = 1.4882 kg/m.

- a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.
- b. When the slab is in an unrestrained condition, minimum reinforcement cover shall not be less than  $1\frac{5}{8}$  inches for 4 hours (siliceous aggregate only);  $1\frac{1}{4}$  inches for 4 and 3 hours; 1 inch for 2 hours (siliceous aggregate only); and  $\frac{3}{4}$  inch for all other restrained and unrestrained conditions.
- c. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with a minimum of  $\frac{1}{16}$  inch gypsum veneer plaster.
- d. Slab thickness over steel joists measured at the joists for metal lath form and at the top of the form for steel form units.
- e. (a) The maximum allowable stress level for H Series joists shall not exceed 22,000 psi.  
 (b) The allowable stress for K Series joists shall not exceed 26,000 psi, the nominal depth of such joist shall not be less than 10 inches and the nominal joist weight shall not be less than 5 pounds per linear foot.
- f. Cement plaster with 15 pounds of hydrated lime and 3 pounds of approved additives or admixtures per bag of cement.
- g. Gypsum wallboard ceilings attached to steel framing shall be permitted to be suspended with  $1\frac{1}{2}$  inch cold formed carrying channels spaced 48 inches on center, which are suspended with No. 8 SWG galvanized wire hangers spaced 48 inches on center. Cross furring channels are tied to the carrying channels with No. 18 SWG galvanized wire hangers spaced 48 inches on center. Cross furring channels are tied to the carrying channels with No. 18 SWG galvanized wire (double strand) and spaced as required for direct attachment to the framing. This alternative is also applicable to those steel framing assemblies recognized under Note q.
- h. Six inch hollow clay tile with 2 inch concrete slab above.
- i. Four inch hollow clay tile with  $1\frac{1}{2}$  inch concrete slab above.
- j. Thickness measured to bottom of steel form units.
- k. Five eighths inch of vermiculite gypsum plaster plus  $\frac{1}{2}$  inch of approved vermiculite acoustical plastic.
- l. Furring channels spaced 12 inches on center.
- m. Double wood floor shall be permitted to be either of the following:
  - (a) Subfloor of 1 inch nominal boarding, a layer of asbestos paper weighing not less than 14 pounds per 100 square feet and a layer of 1 inch nominal tongue and groove finished flooring; or
  - (b) Subfloor of 1 inch nominal tongue and groove boarding or  $\frac{15}{32}$  inch wood structural panels with exterior glue and a layer of 1 inch nominal tongue and groove finished flooring or  $\frac{19}{32}$  inch wood structural panel finish flooring or a layer of Type I Grade M 1 particleboard not less than  $\frac{5}{8}$  inch thick.
- n. The ceiling shall be permitted to be omitted over unusable space, and flooring shall be permitted to be omitted where unusable space occurs above.
- o. For properties of cooler or wallboard nails, see ASTM C 514, ASTM C 547 or ASTM F 1667.
- p. Thickness measured on top of steel deck unit.
- q. Generic fire resistance ratings (those not designated as PROPRIETARY\* in the listing) in the GA 600 shall be accepted as if herein listed.

**721.1.5 Bonded prestressed concrete tendons.** For members having a single tendon or more than one tendon installed with equal concrete cover measured from the nearest surface, the cover shall not be less than that set forth in Table 721.1(1). For members having multiple tendons installed with variable concrete cover, the average tendon cover shall not be less than that set forth in Table 721.1(1), provided:

1. The clearance from each tendon to the nearest exposed surface is used to determine the average cover.
2. In no case can the clear cover for individual tendons be less than one-half of that set forth in Table 721.1(1). A minimum cover of  $\frac{3}{4}$  inch (19.1 mm) for slabs and 1 inch (25 mm) for beams is required for any aggregate concrete.
3. For the purpose of establishing a fire-resistance rating, tendons having a clear covering less than that set forth in Table 721.1(1) shall not contribute more than 50 percent of the required ultimate moment capacity for members less than 350 square inches (0.226 m<sup>2</sup>) in cross-sectional area and 65 percent for larger members. For structural design purposes, however, tendons having a reduced cover are assumed to be fully effective.

#### **721.2 Cellular concrete. [HCD 1 & HCD 2]**

**721.2.1 Use and application [HCD 1 & HCD 2]** Controlled-density cellular concrete, when used or applied, shall be in accordance with the use of materials in Bulletin No. 65 of the Federal Housing Administration, United States Department of Housing and Urban Development.

##### **Exceptions:**

1. Regardless of the provisions of Subsections 3.2, 3.3, 3.4 and 3.6 in Section 3, Bulletin No. 65 provisions relating to proportioning, mixing and testing, in the following shall apply to this chapter.
  - 1.1. Field-control weighings for control of the wet-unit weight shall be made. The design wet-unit weight for field control of the concrete shall be based on previously established data for the relation between the wet-unit weight and the air-dry-unit weight at 28 days for the mix being placed. Field-control weighings for determining the wet-unit weight shall be made at the mixer discharge and at the point of deposit. There should be one pair of weighings per batch for batch-type mixers unless equipment is provided with scales allowing the operator to adequately weigh materials.

For continuous weight-instrumented batch mixers, there should be one pair of weighings per 10 cubic yards (7.65 m<sup>3</sup>). The gain in unit weight between the mixer discharge and point

of deposit shall not exceed 5 percent. The wet-unit weight at the point of deposit of the concrete shall not exceed plus 5 percent of the design wet-unit weight. A variation exceeding plus 5 percent of the design wet-unit weight shall require a modification of the mix proportions, a change of materials or a change in the mixing procedure.

- 1.2. When tests are required by the enforcing agency, they shall be performed in the following manner:

Two test cylinders, for compressive strength tests, shall be made for each 8,000 square feet ( $743 \text{ m}^2$ ) of surface area placed. A minimum of two test cylinders shall be made each day. Each strength test result shall be the average of two cylinders from the same sample tested at 28 days or at a specified earlier date.

- 1.3. The minimum air-dry density shall be 90 pounds per cubic foot ( $1,440 \text{ kg/m}^3$ ). The minimum design compressive strength shall be 1,000 psi (6,890 kPa) when the curing procedure specified herein is applied. The minimum design compressive strength shall be 1,250 psi (8,619 kPa) if the slab is placed in a covered area of a building and a specified curing medium is not applied. The specified design compressive strength shall be increased 20 percent when the specified strength is greater than 1,000 psi (6,890 kPa) and the slab is placed in a covered area of a building and a specified curing medium is not applied.

- 1.4. The cellular concrete shall be sampled at the point of deposit in accordance with the applicable procedures of ASTM C 172, Sampling Fresh Concrete. Cylinder molds shall be either 3 inches by 6 inches (76 mm by 152 mm) or 6 inches by 12 inches (152 mm by 305 mm). Lightly tap the sides of the mold with a rubber hammer while filling the mold instead of rodding the mix. Moist cure the specimens for seven days at  $73.4^\circ\text{F}$  ( $40.8^\circ\text{C}$ ) plus or minus  $3^\circ\text{F}$  ( $1.7^\circ\text{C}$ ). At the age of seven days, remove the specimens from the moist condition and store in a temperature of  $73.4^\circ\text{F}$  ( $40.8^\circ\text{C}$ ) plus or minus  $3^\circ\text{F}$  ( $1.7^\circ\text{C}$ ) and a relative humidity of 50 plus or minus 10 percent for 21 days; remove and air dry until the time of test at 28 days. The compressive strength test shall be in accordance with ASTM C 39, Compressive Strength of Cylindrical Concrete Specimens. Determine the air-dry-unit weight at 28 days.

2. Regardless of the provisions of Subsections 4.1 and 4.2 in Section 4 of Bulletin No. 65, relating to placing, finishing and curing, the following shall apply to these regulations.
  - 2.1. The concrete shall be placed, finished and cured to produce a level, smooth surface. The

concrete shall be placed in a single layer to a minimum thickness of  $1\frac{1}{2}$  inches (38 mm). The deviation from a plan shall not exceed  $\frac{1}{4}$  inch (6 mm) in any 10 feet (3048 mm). The final finish of the concrete shall be suitable for the application of the specified wear-resistant covering. Cracks wider than  $\frac{1}{8}$  inch (3 mm) shall be repaired.

- 2.2. Install a water-resistant membrane between wood or plywood subfloors and the cellular concrete to prevent leakage of the concrete and wetting of the subfloor. The membrane shall consist of waterproof paper or plastic sheets conforming to ASTM C 171, Sheet Materials for Curing Concrete, or Type 15 roofing felt conforming to ASTM D 226, D 250 or D 227, or Federal Specification UUB790, Building Paper Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire-resistant) Type 1, Grade B. The sheets shall be securely fastened to the subfloor.
3. Regardless of the provisions of Subsections 6.1 and 6.2 in Section 6, of Bulletin No. 65, relating to applicator qualifications and warranty, these subsections are omitted from this chapter.

## SECTION 722 CALCULATED FIRE RESISTANCE

**722.1 General.** The provisions of this section contain procedures by which the fire resistance of specific materials or combinations of materials is established by calculations. These procedures apply only to the information contained in this section and shall not be otherwise used. The calculated fire resistance of concrete, concrete masonry and clay masonry assemblies shall be permitted in accordance with ACI 216.1/TMS 0216. The calculated fire resistance of steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29. The calculated fire resistance of exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AF&PA National Design Specification for Wood Construction (NDS).

**722.1.1 Definitions.** The following terms are defined in Chapter 2:

**CERAMIC FIBER BLANKET.**

**CONCRETE, CARBONATE AGGREGATE.**

**CONCRETE, CELLULAR.**

**CONCRETE, LIGHTWEIGHT AGGREGATE.**

**CONCRETE, PERLITE.**

**CONCRETE, SAND-LIGHTWEIGHT.**

**CONCRETE, SILICEOUS AGGREGATE.**

**CONCRETE, VERMICULITE.**

**GLASS FIBERBOARD.**

**MINERAL BOARD.**

**722.2 Concrete assemblies.** The provisions of this section contain procedures by which the fire-resistance ratings of concrete assemblies are established by calculations.

**722.2.1 Concrete walls.** Cast-in-place and precast concrete walls shall comply with Section 722.2.1.1. Multiwythe concrete walls shall comply with Section 722.2.1.2. Joints between precast panels shall comply with Section 722.2.1.3. Concrete walls with gypsum wallboard or plaster finish shall comply with Section 722.2.1.4.

**722.2.1.1 Cast-in-place or precast walls.** The minimum equivalent thicknesses of cast-in-place or precast concrete walls for fire-resistance ratings of 1 hour to 4 hours are shown in Table 722.2.1.1. For solid walls with flat vertical surfaces, the equivalent thickness is the same as the actual thickness. The values in Table 722.2.1.1 apply to plain, reinforced or prestressed concrete walls.

**722.2.1.1.1 Hollow-core precast wall panels.** For hollow-core precast concrete wall panels in which the cores are of constant cross section throughout the length, calculation of the equivalent thickness by dividing the net cross-sectional area (the gross cross section minus the area of the cores) of the panel by its width shall be permitted.

**TABLE 722.2.1.1**  
**MINIMUM EQUIVALENT THICKNESS OF CAST-IN-PLACE OR PRECAST CONCRETE WALLS, LOAD-BEARING OR NONLOAD-BEARING**

CONCRETE TYPE	MINIMUM SLAB THICKNESS (inches) FOR FIRE-RESISTANCE RATING OF				
	1 hour	1½ hours	2 hours	3 hours	4 hours
Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.6	5.7	6.6
Sand-lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

For SI: 1 inch = 25.4 mm.

**722.2.1.1.2 Core spaces filled.** Where all of the core spaces of hollow-core wall panels are filled with

loose-fill material, such as expanded shale, clay, or slag, or vermiculite or perlite, the fire-resistance rating of the wall is the same as that of a solid wall of the same concrete type and of the same over all thickness.

**722.2.1.1.3 Tapered cross sections.** The thickness of panels with tapered cross sections shall be that determined at a distance  $2t$  or 6 inches (152 mm), whichever is less, from the point of minimum thickness, where  $t$  is the minimum thickness.

**722.2.1.1.4 Ribbed or undulating surfaces.** The equivalent thickness of panels with ribbed or undulating surfaces shall be determined by one of the following expressions:

For  $s \geq 4t$ , the thickness to be used shall be  $t$

For  $s \leq 2t$ , the thickness to be used shall be  $t_e$

For  $4t > s > 2t$ , the thickness to be used shall be

$$t + \left( \frac{4t}{s} - 1 \right) (t_e - t) \quad (\text{Equation 7-3})$$

where:

$s$  = Spacing of ribs or undulations.

$t$  = Minimum thickness.

$t_e$  = Equivalent thickness of the panel calculated as the net cross-sectional area of the panel divided by the width, in which the maximum thickness used in the calculation shall not exceed  $2t$ .

**722.2.1.2 Multiwythe walls.** For walls that consist of two wythes of different types of concrete, the fire-resistance ratings shall be permitted to be determined from Figure 722.2.1.2.

**722.2.1.2.1 Two or more wythes.** The fire-resistance rating for wall panels consisting of two or more wythes shall be permitted to be determined by the formula:

**TABLE 722.2.1.2(1)**  
**VALUES OF  $R_n^{0.59}$  FOR USE IN EQUATION 7-4**

TYPE OF MATERIAL	THICKNESS OF MATERIAL (inches)											
	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7
Siliceous aggregate concrete	5.3	6.5	8.1	9.5	11.3	13.0	14.9	16.9	18.8	20.7	22.8	25.1
Carbonate aggregate concrete	5.5	7.1	8.9	10.4	12.0	14.0	16.2	18.1	20.3	21.9	24.7	27.2 <sup>c</sup>
Sand-lightweight concrete	6.5	8.2	10.5	12.8	15.5	18.1	20.7	23.3	26.0 <sup>c</sup>	Note c	Note c	Note c
Lightweight concrete	6.6	8.8	11.2	13.7	16.5	19.1	21.9	24.7	27.8 <sup>c</sup>	Note c	Note c	Note c
Insulating concrete <sup>a</sup>	9.3	13.3	16.6	18.3	23.1	26.5 <sup>c</sup>	Note c	Note c	Note c	Note c	Note c	Note c
Airspace <sup>b</sup>	—	—	—	—	—	—	—	—	—	—	—	—

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.02 kg/m<sup>3</sup>.

a. Dry unit weight of 35pcf or less and consisting of cellular, perlite or vermiculite concrete.

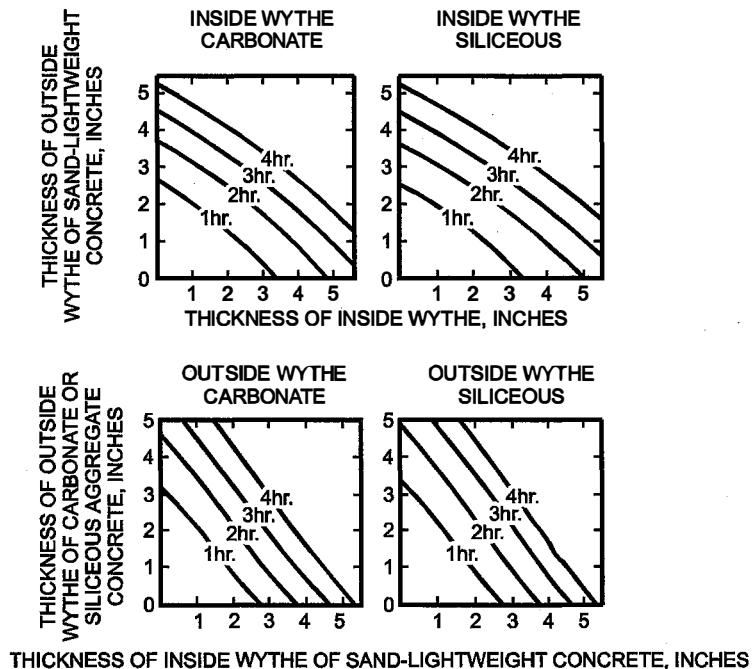
b. The  $R_n^{0.59}$  value for one 1½" to 3½" airspace is 3.3. The  $R_n^{0.59}$  value for two 1½" to 3½" airspaces is 6.7.

c. The fire resistance rating for this thickness exceeds 4 hours.

**TABLE 722.2.1.2(2)**  
**FIRE-RESISTANCE RATINGS BASED ON  $R^{0.59}$**

<b><math>R^a</math>, MINUTES</b>	<b><math>R^{0.59}</math></b>
60	11.20
120	16.85
180	21.41
240	25.37

a. Based on Equation 7-4.



For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.1.2**  
**FIRE-RESISTANCE RATINGS OF TWO-WYTHE CONCRETE WALLS**

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59})^{1.7} \quad (\text{Equation 7-4})$$

where:

$R$  = The fire endurance of the assembly, minutes.

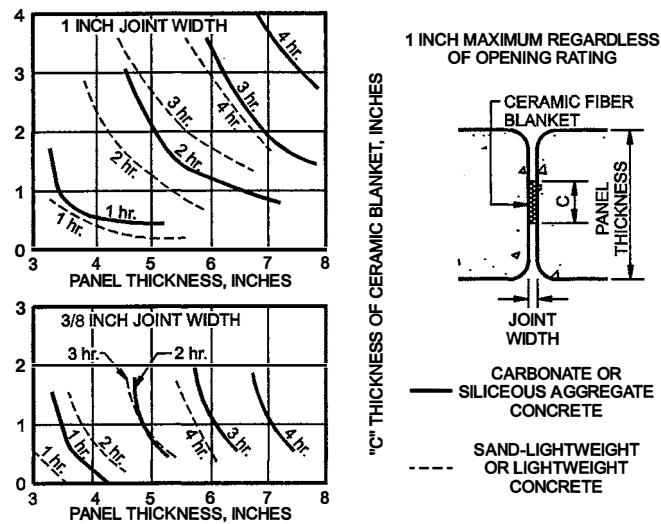
$R_1$ ,  $R_2$ , and  $R_n$  = The fire endurances of the individual wythes, minutes. Values of  $R_n^{0.59}$  for use in Equation 7-4 are given in Table 722.2.1.2(1). Calculated fire-resistance ratings are shown in Table 722.2.1.2(2).

**722.2.1.2.2 Foam plastic insulation.** The fire-resistance ratings of precast concrete wall panels consisting of a layer of foam plastic insulation sandwiched between two wythes of concrete shall be permitted to be determined by use of Equation 7-4. Foam plastic insulation with a total thickness of less than 1 inch (25 mm) shall be disregarded. The  $R_n$  value for thickness of foam plastic insulation of 1 inch (25 mm) or greater, for use in the calculation, is 5 minutes; therefore  $R_n^{0.59} = 2.5$ .

**722.2.1.3 Joints between precast wall panels.** Joints between precast concrete wall panels which are not insulated as required by this section shall be

considered as openings in walls. Uninsulated joints shall be included in determining the percentage of openings permitted by Table 705.8. Where openings are not permitted or are required by this code to be protected, the provisions of this section shall be used to determine the amount of joint insulation required. Insulated joints shall not be considered openings for purposes of determining compliance with the allowable percentage of openings in Table 705.8.

**722.2.1.3.1 Ceramic fiber joint protection.** Figure 722.2.1.3.1 shows thicknesses of ceramic fiber blankets to be used to insulate joints between precast concrete wall panels for various panel thicknesses and for joint widths of  $\frac{3}{8}$  inch (9.5 mm) and 1 inch (25 mm) for fire-resistance ratings of 1 hour to 4 hours. For joint widths between  $\frac{3}{8}$  inch (9.5 mm) and 1 inch (25 mm), the thickness of ceramic fiber blanket is allowed to be determined by direct interpolation. Other tested and labeled materials are acceptable in place of ceramic fiber blankets.



For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.1.3.1  
CERAMIC FIBER JOINT PROTECTION**

**722.2.1.4 Walls with gypsum wallboard or plaster finishes.** The fire-resistance rating of cast-in-place or precast concrete walls with finishes of gypsum wallboard or plaster applied to one or both sides shall be permitted to be calculated in accordance with the provisions of this section.

**722.2.1.4.1 Nonfire-exposed side.** Where the finish of gypsum wallboard or plaster is applied to the side of the wall not exposed to fire, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The thickness of the finish shall first be corrected by multiplying the actual thickness of the finish by the applicable factor determined from Table 722.2.1.4(1) based on the type of aggregate in the concrete. The corrected thickness of finish shall then be added to the actual or equivalent thickness of concrete and fire-resistance rating of the concrete and finish determined from Table 722.2.1.1, Figure 722.2.1.2 or Table 722.2.1.2(1).

**722.2.1.4.2 Fire-exposed side.** Where gypsum wallboard or plaster is applied to the fire-exposed side of the wall, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The time assigned to the finish as established by Table 722.2.1.4(2) shall be added to the fire-resistance rating determined from Table 722.2.1.1 or Figure 722.2.1.2, or Table 722.2.1.2(1) for the concrete alone, or to the rating determined in Section 722.2.1.4.1 for the concrete and finish on the non-fire-exposed side.

**722.2.1.4.3 Nonsymmetrical assemblies.** For a wall having no finish on one side or different types or thicknesses of finish on each side, the calculation procedures of Sections 722.2.1.4.1 and 722.2.1.4.2 shall be performed twice, assuming either side of the wall to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values.

**Exception:** For an exterior wall with a fire separation distance greater than 5 feet (1524 mm) the fire shall be assumed to occur on the interior side only.

**722.2.1.4.4 Minimum concrete fire-resistance rating.** Where finishes applied to one or both sides of a concrete wall contribute to the fire-resistance rating, the concrete alone shall provide not less than one-half of the total required fire-resistance rating. Additionally, the contribution to the fire resistance of the finish on the nonfire-exposed side of a load-bearing wall shall not exceed one-half the contribution of the concrete alone.

**722.2.1.4.5 Concrete finishes.** Finishes on concrete walls that are assumed to contribute to the total fire-resistance rating of the wall shall comply with the installation requirements of Section 722.3.2.5.

**722.2.2 Concrete floor and roof slabs.** Reinforced and prestressed floors and roofs shall comply with Section 722.2.2.1. Multicourse floors and roofs shall comply with Sections 722.2.2.2 and 722.2.2.3, respectively.

**TABLE 722.2.1.4(1)  
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF WALL**

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Concrete Masonry: siliceous or carbonate; solid clay brick	Concrete: sand-lightweight Concrete Masonry: clay tile; hollow clay brick; concrete masonry units of expanded shale and < 20% sand	Concrete: lightweight Concrete Masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or pumice < 20% sand	Concrete Masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75 <sup>a</sup>	0.75 <sup>a</sup>	0.50 <sup>a</sup>
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm.

- a. For Portland cement sand plaster  $\frac{5}{8}$  inch or less in thickness and applied directly to the concrete or concrete masonry on the nonfire exposed side of the wall, the multiplying factor shall be 1.00.

**FIRE AND SMOKE PROTECTION FEATURES**

**TABLE 722.2.1.4(2)**  
**TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF WALL**

FINISH DESCRIPTION	TIME (minutes)
Gypsum wallboard $\frac{3}{8}$ inch	10
$\frac{1}{2}$ inch	15
$\frac{5}{8}$ inch	20
2 layers of $\frac{3}{8}$ inch	25
1 layer $\frac{3}{8}$ inch, 1 layer $\frac{1}{2}$ inch	35
2 layers $\frac{1}{2}$ inch	40
Type X gypsum wallboard $\frac{1}{2}$ inch	25
$\frac{5}{8}$ inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note a
Portland cement-sand plaster on metal lath $\frac{3}{4}$ inch	20
$\frac{7}{8}$ inch	25
1 inch	30
Gypsum sand plaster on $\frac{3}{8}$ -inch gypsum lath $\frac{1}{2}$ inch	35
$\frac{5}{8}$ inch	40
$\frac{3}{4}$ inch	50
Gypsum sand plaster on metal lath $\frac{3}{4}$ inch	50
$\frac{7}{8}$ inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

- a. The actual thickness of Portland cement sand plaster, provided it is  $\frac{5}{8}$  inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 722.3.2.

**722.2.2.1 Reinforced and prestressed floors and roofs.** The minimum thicknesses of reinforced and prestressed concrete floor or roof slabs for fire-resistance ratings of 1 hour to 4 hours are shown in Table 722.2.2.1.

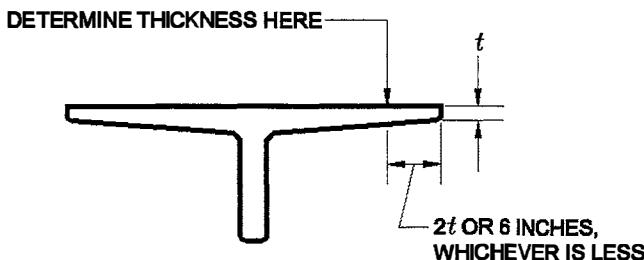
**TABLE 722.2.2.1**  
**MINIMUM SLAB THICKNESS (inches)**

CONCRETE TYPE	FIRE-RESISTANCE RATING (hours)				
	1	$1\frac{1}{2}$	2	3	4
Siliceous	3.5	4.3	5	6.2	7
Carbonate	3.2	4	4.6	5.7	6.6
Sand-lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

For SI: 1 inch = 25.4 mm.

**722.2.2.1.1 Hollow-core prestressed slabs.** For hollow-core prestressed concrete slabs in which the cores are of constant cross section throughout the length, the equivalent thickness shall be permitted to be obtained by dividing the net cross-sectional area of the slab including grout in the joints, by its width.

**722.2.2.1.2 Slabs with sloping soffits.** The thickness of slabs with sloping soffits (see Figure 722.2.2.1.2) shall be determined at a distance  $2t$  or 6 inches (152 mm), whichever is less, from the point of minimum thickness, where  $t$  is the minimum thickness.



For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.2.1.2**  
**DETERMINATION OF SLAB THICKNESS FOR SLOPING SOFFITS**

**722.2.2.1.3 Slabs with ribbed soffits.** The thickness of slabs with ribbed or undulating soffits (see Figure 722.2.2.1.3) shall be determined by one of the following expressions, whichever is applicable:

For  $s > 4t$ , the thickness to be used shall be  $t$

For  $s \leq 2t$ , the thickness to be used shall be  $t_e$

For  $4t > s > 2t$ , the thickness to be used shall be

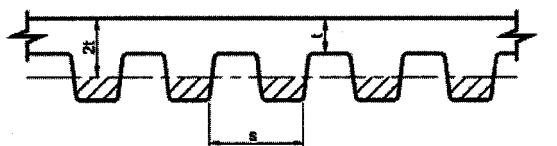
$$t + \left( \frac{4t}{s} - 1 \right) (t_e - t) \quad (\text{Equation 7-5})$$

where:

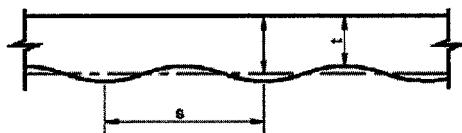
$s$  = Spacing of ribs or undulations.

$t$  = Minimum thickness.

$t_e$  = Equivalent thickness of the slab calculated as the net area of the slab divided by the width, in which the maximum thickness used in the calculation shall not exceed  $2t$ .



NEGLECT SHADED AREA IN CALCULATION OF EQUIVALENT THICKNESS

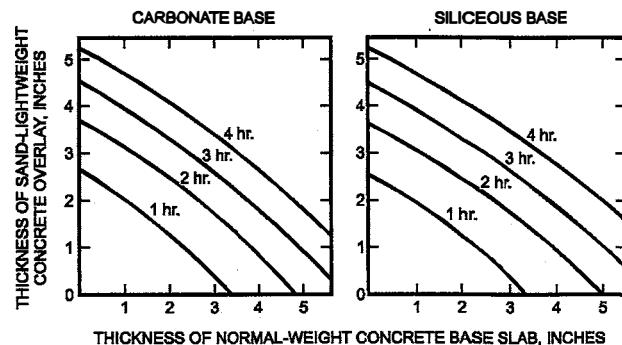


For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.2.1.3**  
SLABS WITH RIBBED OR UNDULATING SOFFITS

**722.2.2.2 Multicourse floors.** The fire-resistance ratings of floors that consist of a base slab of concrete with a topping (overlay) of a different type of concrete shall comply with Figure 722.2.2.2.

**722.2.2.3 Multicourse roofs.** The fire-resistance ratings of roofs which consist of a base slab of concrete with a topping (overlay) of an insulating concrete or with an insulating board and built-up roofing shall comply with Figures 722.2.2.3(1) and 722.2.2.3(2).



For SI: 1 inch = 25.4 mm.

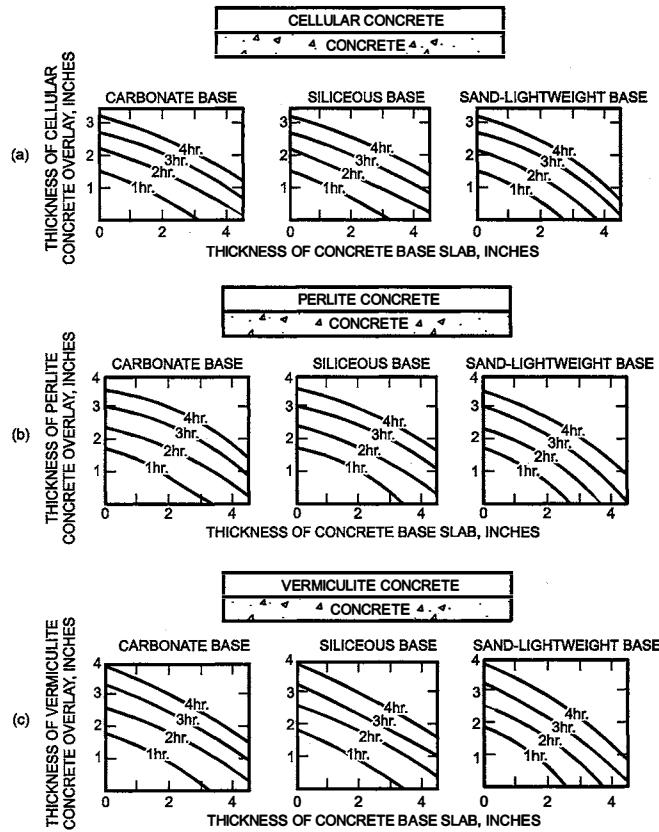
**FIGURE 722.2.2**  
FIRE-RESISTANCE RATINGS FOR  
TWO-COURSE CONCRETE FLOORS

**722.2.2.3.1 Heat transfer.** For the transfer of heat, three-ply built-up roofing contributes 10 minutes to the fire-resistance rating. The fire-resistance rating for concrete assemblies such as those shown in Figure 722.2.2.3(1) shall be increased by 10 minutes. This increase is not applicable to those shown in Figure 722.2.2.3(2).

**722.2.2.4 Joints in precast slabs.** Joints between adjacent precast concrete slabs need not be considered in calculating the slab thickness provided that a concrete topping at least 1 inch (25 mm) thick is used. Where no concrete topping is used, joints must be grouted to a depth of at least one-third the slab thickness at the joint, but not less than 1 inch (25 mm), or the joints must be made fire resistant by other approved methods.

**722.2.3 Concrete cover over reinforcement.** The minimum thickness of concrete cover over reinforcement in concrete slabs, reinforced beams and prestressed beams shall comply with this section.

## FIRE AND SMOKE PROTECTION FEATURES



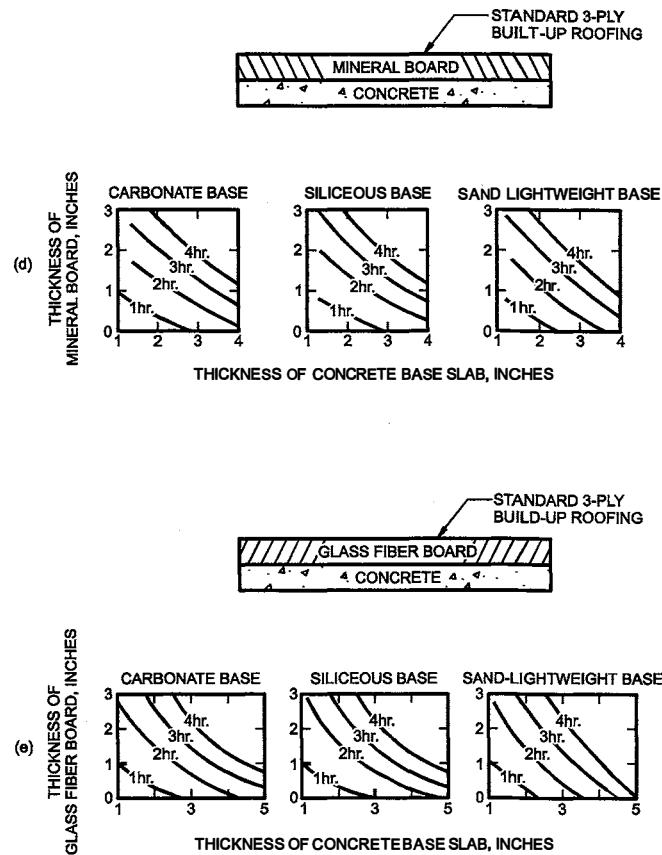
For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.2.3(1)**  
**FIRE-RESISTANCE RATINGS FOR CONCRETE ROOF ASSEMBLIES**

**722.2.3.1 Slab cover.** The minimum thickness of concrete cover to the positive moment reinforcement shall comply with Table 722.2.3(1) for reinforced concrete and Table 722.2.3(2) for prestressed concrete. These tables are applicable for solid or hollow-core one-way or two-way slabs with flat undersurfaces. These tables are applicable to slabs that are either cast in place or precast. For precast prestressed concrete not covered elsewhere, the procedures contained in PCI MNL 124 shall be acceptable.

**722.2.3.2 Reinforced beam cover.** The minimum thickness of concrete cover to the positive moment reinforcement (bottom steel) for reinforced concrete beams is shown in Table 722.2.3(3) for fire-resistance ratings of 1 hour to 4 hours.

**722.2.3.3 Prestressed beam cover.** The minimum thickness of concrete cover to the positive moment pre-stressing tendons (bottom steel) for restrained and unrestrained prestressed concrete beams and stemmed units shall comply with the values shown in Tables 722.2.3(4) and 722.2.3(5) for fire-resistance ratings of 1 hour to 4 hours. Values in Table 722.2.3(4) apply to beams 8 inches (203 mm) or greater in width. Values in Table 722.2.3(5) apply to beams or stems of any width, provided the cross-section area is not less than 40 square inches ( $25\ 806\ mm^2$ ). In case of differences



For SI: 1 inch = 25.4 mm.

**FIGURE 722.2.2.3(2)**  
**FIRE-RESISTANCE RATINGS FOR CONCRETE ROOF ASSEMBLIES**

between the values determined from Table 722.2.3(4) or 722.2.3(5), it is permitted to use the smaller value. The concrete cover shall be calculated in accordance with Section 722.2.3.3.1. The minimum concrete cover for nonprestressed reinforcement in prestressed concrete beams shall comply with Section 722.2.3.2.

**722.2.3.3.1 Calculating concrete cover.** The concrete cover for an individual tendon is the minimum thickness of concrete between the surface of the tendon and the fire-exposed surface of the beam, except that for ungrouted ducts, the assumed cover thickness is the minimum thickness of concrete between the surface of the duct and the fire-exposed surface of the beam. For beams in which two or more tendons are used, the cover is assumed to be the average of the minimum cover of the individual tendons. For corner tendons (tendons equal distance from the bottom and side), the minimum cover used in the calculation shall be one-half the actual value. For stemmed members with two or more prestressing tendons located along the vertical centerline of the stem, the average cover shall be the distance from the bottom of the member to the centroid of the tendons. The actual cover for any individual tendon shall not be less than one-half the smaller value shown in Tables 722.2.3(4) and 722.2.3(5), or 1 inch (25 mm), whichever is greater.

**TABLE 722.2.3(1)**  
**COVER THICKNESS FOR REINFORCED CONCRETE FLOOR OR ROOF SLABS (inches)**

CONCRETE AGGREGATE TYPE	FIRE-RESISTANCE RATING (hours)									
	Restrained					Unrestrained				
	1	1½	2	3	4	1	1½	2	3	4
Siliceous	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1	1 1/4	1 5/8
Carbonate	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1 1/4	1 1/4
Sand-lightweight or lightweight	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1 1/4	1 1/4

For SI: 1 inch = 25.4 mm.

**TABLE 722.2.3(2)**  
**COVER THICKNESS FOR PRESTRESSED CONCRETE FLOOR OR ROOF SLABS (inches)**

CONCRETE AGGREGATE TYPE	FIRE-RESISTANCE RATING (hours)									
	Restrained					Unrestrained				
	1	1½	2	3	4	1	1½	2	3	4
Siliceous	3/4	3/4	3/4	3/4	3/4	1 1/8	1 1/2	1 3/4	2 3/8	2 3/4
Carbonate	3/4	3/4	3/4	3/4	3/4	1	1 3/8	1 5/8	2 1/8	2 1/4
Sand-lightweight or lightweight	3/4	3/4	3/4	3/4	3/4	1	1 3/8	1 1/2	2	2 1/4

For SI: 1 inch = 25.4 mm.

**TABLE 722.2.3(3)**  
**MINIMUM COVER FOR MAIN REINFORCING BARS OF REINFORCED CONCRETE BEAMS<sup>c</sup>  
(APPLICABLE TO ALL TYPES OF STRUCTURAL CONCRETE)**

RESTRAINED OR UNRESTRAINED <sup>a</sup>	BEAM WIDTH <sup>b</sup> (inches)	FIRE-RESISTANCE RATING (hours)				
		1	1½	2	3	4
Restrained	5	3/4	3/4	3/4	1 <sup>a</sup>	1 1/4 <sup>a</sup>
	7	3/4	3/4	3/4	3/4	3/4
	≥ 10	3/4	3/4	3/4	3/4	3/4
Unrestrained	5	3/4	1	1 1/4	—	—
	7	3/4	3/4	3/4	1 3/4	3
	≥ 10	3/4	3/4	3/4	1	1 3/4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of 3/4 inch is adequate for ratings of 4 hours or less.
- b. For beam widths between the tabulated values, the minimum cover thickness can be determined by direct interpolation.
- c. The cover for an individual reinforcing bar is the minimum thickness of concrete between the surface of the bar and the fire exposed surface of the beam. For beams in which several bars are used, the cover for corner bars used in the calculation shall be reduced to one half of the actual value. The cover for an individual bar must be not less than one half of the value given in Table 722.2.3(3) nor less than 3/4 inch.

**TABLE 722.2.3(4)**  
**MINIMUM COVER FOR PRESTRESSED CONCRETE BEAMS 8 INCHES OR GREATER IN WIDTH<sup>b</sup>**

RESTRAINED OR UNRESTRAINED <sup>a</sup>	CONCRETE AGGREGATE TYPE	BEAM WIDTH (inches)	FIRE-RESISTANCE RATING (hours)				
			1	1½	2	3	4
Restrained	Carbonate or siliceous	8	1 1/2	1 1/2	1 1/2	1 3/4 <sup>a</sup>	2 1/2 <sup>a</sup>
	Carbonate or siliceous	≥ 12	1 1/2	1 1/2	1 1/2	1 7/8 <sup>a</sup>	1 7/8 <sup>a</sup>
	Sand lightweight	8	1 1/2	1 1/2	1 1/2	1 1/2	2 <sup>a</sup>
	Sand lightweight	≥ 12	1 1/2	1 1/2	1 1/2	1 1/2	1 5/8 <sup>a</sup>
Unrestrained	Carbonate or siliceous	8	1 1/2	1 3/4	2 1/2	5 <sup>c</sup>	—
	Carbonate or siliceous	≥ 12	1 1/2	1 1/2	1 7/8 <sup>a</sup>	2 1/2	3
	Sand lightweight	8	1 1/2	1 1/2	2	3 1/4 <sup>a</sup>	—
	Sand lightweight	≥ 12	1 1/2	1 1/2	1 5/8	2	2 1/2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of 3/4 inch is adequate for 4 hour ratings or less.
- b. For beam widths between 8 inches and 12 inches, minimum cover thickness can be determined by direct interpolation.
- c. Not practical for 8 inch wide beam but shown for purposes of interpolation.

**TABLE 722.2.3(5)**  
**MINIMUM COVER FOR PRESTRESSED CONCRETE BEAMS OF ALL WIDTHS**

RESTRAINED OR UNRESTRAINED <sup>a</sup>	CONCRETE AGGREGATE TYPE	BEAM AREA <sup>b</sup> A (square inches)	FIRE-RESISTANCE RATING (hours)				
			1	1½	2	3	4
Restrained	All	40 ≤ A ≤ 150	1½	1½	2	2½	—
	Carbonate or siliceous	150 < A ≤ 300	1½	1½	1½	1¾	2½
		300 < A	1½	1½	1½	1½	2
	Sand lightweight	150 < A	1½	1½	1½	1½	2
Unrestrained	All	40 ≤ A ≤ 150	2	2½	—	—	—
	Carbonate or siliceous	150 < A ≤ 300	1½	1¾	2½	—	—
		300 < A	1½	1½	2	3 <sup>c</sup>	4 <sup>c</sup>
	Sand lightweight	150 < A	1½	1½	2	3 <sup>c</sup>	4 <sup>c</sup>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Tabulated values for restrained assemblies apply to beams spaced more than 4 feet on center. For restrained beams spaced 4 feet or less on center, minimum cover of  $\frac{3}{4}$  inch is adequate for 4 hour ratings or less.
- b. The cross sectional area of a stem is permitted to include a portion of the area in the flange, provided the width of the flange used in the calculation does not exceed three times the average width of the stem.
- c. U shaped or hooped stirrups spaced not to exceed the depth of the member and having a minimum cover of 1 inch shall be provided.

**722.2.4 Concrete columns.** Concrete columns shall comply with this section.

**TABLE 722.2.4**  
**MINIMUM DIMENSION OF CONCRETE COLUMNS (inches)**

TYPES OF CONCRETE	FIRE-RESISTANCE RATING (hours)				
	1	1½	2 <sup>a</sup>	3 <sup>a</sup>	4 <sup>b</sup>
Siliceous	8	9	10	12	14
Carbonate	8	9	10	11	12
Sand-lightweight	8	8½	9	10½	12

For SI: 1 inch = 25 mm.

- a. The minimum dimension is permitted to be reduced to 8 inches for rectangular columns with two parallel sides at least 36 inches in length.
- b. The minimum dimension is permitted to be reduced to 10 inches for rectangular columns with two parallel sides at least 36 inches in length.

**722.2.4.1 Minimum size.** The minimum overall dimensions of reinforced concrete columns for fire-resistance ratings of 1 hour to 4 hours for exposure to fire on all sides shall comply with this section.

**722.2.4.1.1 Concrete strength less than or equal to 12,000 psi.** For columns made with concrete having a specified compressive strength,  $f'_c$ , of less than or equal to 12,000 psi (82.7 MPa), the minimum dimension shall comply with Table 722.2.4.

**722.2.4.1.2 Concrete strength greater than 12,000 psi.** For columns made with concrete having a specified compressive strength,  $f'_c$ , greater than 12,000 psi (82.7 MPa), for fire-resistance ratings of 1 hour to 4 hours the minimum dimension shall be 24 inches (610 mm).

**722.2.4.2 Minimum cover for R/C columns.** The minimum thickness of concrete cover to the main longitudinal reinforcement in columns, regardless of the type of aggregate used in the concrete and the specified compressive strength of concrete,  $f'_c$ , shall not be less

than 1 inch (25 mm) times the number of hours of required fire resistance or 2 inches (51 mm), whichever is less.

**722.2.4.3 Tie and spiral reinforcement.** For concrete columns made with concrete having a specified compressive strength,  $f'_c$ , greater than 12,000 psi (82.7 MPa), tie and spiral reinforcement shall comply with the following:

1. The free ends of rectangular ties shall terminate with a 135-degree (2.4 rad) standard tie hook.
2. The free ends of circular ties shall terminate with a 90-degree (1.6 rad) standard tie hook.
3. The free ends of spirals, including at lap splices, shall terminate with a 90-degree (1.6 rad) standard tie hook.

The hook extension at the free end of ties and spirals shall be the larger of six bar diameters and the extension required by Section 7.1.3 of ACI 318. Hooks shall project into the core of the column.

**722.2.4.4 Columns built into walls.** The minimum dimensions of Table 722.2.4 do not apply to a reinforced concrete column that is built into a concrete or masonry wall provided all of the following are met:

1. The fire-resistance rating for the wall is equal to or greater than the required rating of the column;
2. The main longitudinal reinforcing in the column has cover not less than that required by Section 722.2.4.2; and
3. Openings in the wall are protected in accordance with Table 716.5.

Where openings in the wall are not protected as required by Section 716.5, the minimum dimension of columns required to have a fire-resistance rating of 3 hours or less shall be 8 inches (203 mm), and 10 inches (254 mm) for columns required to have a fire-resistance

rating of 4 hours, regardless of the type of aggregate used in the concrete.

**722.2.4.5 Precast cover units for steel columns.** See Section 722.5.1.4.

**722.3 Concrete masonry.** The provisions of this section contain procedures by which the fire-resistance ratings of concrete masonry are established by calculations.

**722.3.1 Equivalent thickness.** The equivalent thickness of concrete masonry construction shall be determined in accordance with the provisions of this section.

**722.3.1.1 Concrete masonry unit plus finishes.** The equivalent thickness of concrete masonry assemblies,  $T_{ea}$ , shall be computed as the sum of the equivalent thickness of the concrete masonry unit,  $T_e$ , as determined by Section 722.3.1.2, 722.3.1.3 or 722.3.1.4, plus the equivalent thickness of finishes,  $T_{ef}$ , determined in accordance with Section 722.3.2:

$$T_{ea} = T_e + T_{ef} \quad (\text{Equation 7-6})$$

**722.3.1.2 UngROUTed or partially grouted construction.**  $T_e$  shall be the value obtained for the concrete masonry unit determined in accordance with ASTM C 140.

**722.3.1.3 Solid grouted construction.** The equivalent thickness,  $T_e$ , of solid grouted concrete masonry units is the actual thickness of the unit.

**722.3.1.4 Airspaces and cells filled with loose-fill material.** The equivalent thickness of completely filled hollow concrete masonry is the actual thickness of the unit when loose-fill materials are: sand, pea gravel, crushed stone, or slag that meet ASTM C 33 requirements; pumice, scoria, expanded shale, expanded clay, expanded slate, expanded slag, expanded fly ash, or cinders that comply with ASTM C 331; or perlite or vermiculite meeting the requirements of ASTM C 549 and ASTM C 516, respectively.

**722.3.2 Concrete masonry walls.** The fire-resistance rating of walls and partitions constructed of concrete masonry units shall be determined from Table 722.3.2. The rating shall be based on the equivalent thickness of the masonry and type of aggregate used.

**722.3.2.1 Finish on nonfire-exposed side.** Where plaster or gypsum wallboard is applied to the side of the wall not exposed to fire, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The thickness of gypsum wallboard or plaster shall be corrected by multiplying the actual thickness of the finish by applicable factor determined from Table 722.2.1.4(1). This corrected thickness of finish shall be added to the equivalent thickness of masonry and the fire-resistance rating of the masonry and finish determined from Table 722.3.2.

**722.3.2.2 Finish on fire-exposed side.** Where plaster or gypsum wallboard is applied to the fire-exposed side of the wall, the contribution of the finish to the total fire-resistance rating shall be determined as follows: The time assigned to the finish as established by Table 722.2.1.4(2) shall be added to the fire-resistance rating determined in Section 722.3.2 for the masonry alone, or in Section 722.3.2.1 for the masonry and finish on the nonfire-exposed side.

**722.3.2.3 Nonsymmetrical assemblies.** For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side of the wall to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values calculated.

**Exception:** For exterior walls with a fire separation distance greater than 5 feet (1524 mm) the fire shall be assumed to occur on the interior side only.

**722.3.2.4 Minimum concrete masonry fire-resistance rating.** Where the finish applied to a concrete masonry wall contributes to its fire-resistance rating, the masonry alone shall provide not less than one-half the total required fire-resistance rating.

**722.3.2.5 Attachment of finishes.** Installation of finishes shall be as follows:

1. Gypsum wallboard and gypsum lath applied to concrete masonry or concrete walls shall be secured to wood or steel furring members spaced not more than 16 inches (406 mm) on center (o.c.).

**TABLE 722.3.2**  
**MINIMUM EQUIVALENT THICKNESS (inches) OF BEARING OR NONBEARING CONCRETE MASONRY WALLS<sup>a,b,c,d</sup>**

TYPE OF AGGREGATE	FIRE-RESISTANCE RATING (hours)														
	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
Pumice or expanded slag	1.5	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.7
Expanded shale, clay or slate	1.8	2.2	2.6	2.9	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1
Limestone, cinders or unexpanded slag	1.9	2.3	2.7	3.1	3.4	3.7	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9
Calcareous or siliceous gravel	2.0	2.4	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.2

For SI: 1 inch = 25.4 mm.

- Values between those shown in the table can be determined by direct interpolation.
- Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown in the table.
- Requirements of ASTM C 55, ASTM C 73, ASTM C 90 or ASTM C 744 shall apply.
- Minimum required equivalent thickness corresponding to the hourly fire-resistance rating for units with a combination of aggregate shall be determined by linear interpolation based on the percent by volume of each aggregate used in manufacture.

2. Gypsum wallboard shall be installed with the long dimension parallel to the furring members and shall have all joints finished.
3. Other aspects of the installation of finishes shall comply with the applicable provisions of Chapters 7 and 25.

**722.3.3 Multiwythe masonry walls.** The fire-resistance rating of wall assemblies constructed of multiple wythes of masonry materials shall be permitted to be based on the fire-resistance rating period of each wythe and the continuous airspace between each wythe in accordance with the following formula:

$$R_A = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59} + A_1 + A_2 + \dots + A_n)^{1/7} \quad (\text{Equation 7-7})$$

where:

$R_A$  = Fire-resistance rating of the assembly (hours).

$R_1, R_2, \dots, R_n$  = Fire-resistance rating of wythes for 1, 2,  $n$  (hours), respectively.

$A_1, A_2, \dots, A_n$  = 0.30, factor for each continuous airspace for 1, 2, ...,  $n$ , respectively, having a depth of  $\frac{1}{2}$  inch (12.7 mm) or more between wythes.

**722.3.4 Concrete masonry lintels.** Fire-resistance ratings for concrete masonry lintels shall be determined based upon the nominal thickness of the lintel and the minimum thickness of concrete masonry or concrete, or any combination thereof, covering the main reinforcing bars, as determined according to Table 722.3.4, or by approved alternate methods.

**TABLE 722.3.4  
MINIMUM COVER OF LONGITUDINAL REINFORCEMENT IN FIRE-RESISTANCE-RATED REINFORCED CONCRETE MASONRY LINTELS (inches)**

NOMINAL WIDTH OF LINTEL (inches)	FIRE-RESISTANCE RATING (hours)			
	1	2	3	4
6	1 $\frac{1}{2}$	2	—	—
8	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	3
10 or greater	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$

For SI: 1 inch = 25.4 mm.

**TABLE 722.4.1(1)  
FIRE-RESISTANCE PERIODS OF CLAY MASONRY WALLS**

MATERIAL TYPE	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE RESISTANCE <sup>a, b, c</sup> (inches)			
	1 hour	2 hours	3 hours	4 hours
Solid brick or clay or shale <sup>d</sup>	2.7	3.8	4.9	6.0
Hollow brick or tile of clay or shale, unfilled	2.3	3.4	4.3	5.0
Hollow brick or tile of clay or shale, grouted or filled with materials specified in Section 722.4.1.1.3	3.0	4.4	5.5	6.6

For SI: 1 inch = 25.4 mm.

- a. Equivalent thickness as determined from Section 722.4.1.1.
- b. Calculated fire resistance between the hourly increments listed shall be determined by linear interpolation.
- c. Where combustible members are framed in the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown.
- d. For units in which the net cross sectional area of cored brick in any plane parallel to the surface containing the cores is at least 75 percent of the gross cross sectional area measured in the same plane.

**722.3.5 Concrete masonry columns.** The fire-resistance rating of concrete masonry columns shall be determined based upon the least plan dimension of the column in accordance with Table 722.3.5 or by approved alternate methods.

**TABLE 722.3.5  
MINIMUM DIMENSION OF CONCRETE MASONRY COLUMNS (inches)**

FIRE-RESISTANCE RATING (hours)			
1	2	3	4
8 inches	10 inches	12 inches	14 inches

For SI: 1 inch = 25.4 mm.

**722.4 Clay brick and tile masonry.** The provisions of this section contain procedures by which the fire-resistance ratings of clay brick and tile masonry are established by calculations.

**722.4.1 Masonry walls.** The fire-resistance rating of masonry walls shall be based upon the equivalent thickness as calculated in accordance with this section. The calculation shall take into account finishes applied to the wall and airspaces between wythes in multiwythe construction.

**722.4.1.1 Equivalent thickness.** The fire-resistance ratings of walls or partitions constructed of solid or hollow clay masonry units shall be determined from Table 722.4.1(1) or 722.4.1(2). The equivalent thickness of the clay masonry unit shall be determined by Equation 7-8 when using Table 722.4.1(1). The fire-resistance rating determined from Table 722.4.1(1) shall be permitted to be used in the calculated fire-resistance rating procedure in Section 722.4.2.

$$T_e = V_n/LH \quad (\text{Equation 7-8})$$

where:

$T_e$  = The equivalent thickness of the clay masonry unit (inches).

$V_n$  = The net volume of the clay masonry unit (inch<sup>3</sup>).

$L$  = The specified length of the clay masonry unit (inches).

$H$  = The specified height of the clay masonry unit (inches).

**TABLE 722.4.1(2)**  
**FIRE-RESISTANCE RATINGS FOR BEARING STEEL FRAME BRICK VENEER WALLS OR PARTITIONS**

WALL OR PARTITION ASSEMBLY	PLASTER SIDE EXPOSED (hours)	BRICK FACED SIDE EXPOSED (hours)
Outside facing of steel studs: 1/2" wood fiberboard sheathing next to studs, 3/4" airspace formed with 3/4" x 15/8" wood strips placed over the fiberboard and secured to the studs; metal or wire lath nailed to such strips, 3/4" brick veneer held in place by filling 3/4" airspace between the brick and lath with mortar. Inside facing of studs: 3/4" unsanded gypsum plaster on metal or wire lath attached to 5/16" wood strips secured to edges of the studs.	1.5	4
Outside facing of steel studs: 1" insulation board sheathing attached to studs, 1" airspace, and 3/4" brick veneer attached to steel frame with metal ties every 5th course. Inside facing of studs: 7/8" sanded gypsum plaster (1:2 mix) applied on metal or wire lath attached directly to the studs.	1.5	4
Same as above except use 7/8" vermiculite-gypsum plaster or 1" sanded gypsum plaster (1:2 mix) applied to metal or wire.	2	4
Outside facing of steel studs: 1/2" gypsum sheathing board, attached to studs, and 3/4" brick veneer attached to steel frame with metal ties every 5th course. Inside facing of studs: 1/2" sanded gypsum plaster (1:2 mix) applied to 1/2" perforated gypsum lath securely attached to studs and having strips of metal lath 3 inches wide applied to all horizontal joints of gypsum lath.	2	4

For SI: 1 inch = 25.4 mm.

**722.4.1.1 Hollow clay units.** The equivalent thickness,  $T_e$ , shall be the value obtained for hollow clay units as determined in accordance with Equation 7-8. The net volume,  $V_n$ , of the units shall be determined using the gross volume and percentage of void area determined in accordance with ASTM C 67.

**722.4.1.1.2 Solid grouted clay units.** The equivalent thickness of solid grouted clay masonry units shall be taken as the actual thickness of the units.

**722.4.1.1.3 Units with filled cores.** The equivalent thickness of the hollow clay masonry units is the actual thickness of the unit when completely filled with loose-fill materials of: sand, pea gravel, crushed stone, or slag that meet ASTM C 33 requirements; pumice, scoria, expanded shale, expanded clay, expanded slate, expanded slag, expanded fly ash, or cinders in compliance with ASTM C 331; or perlite or vermiculite meeting the requirements of ASTM C 549 and ASTM C 516, respectively.

**722.4.1.2 Plaster finishes.** Where plaster is applied to the wall, the total fire-resistance rating shall be determined by the formula:

$$R = (R_n^{0.59} + pl)^{1.7} \quad (\text{Equation 7-9})$$

where:

$R$  = The fire-resistance rating of the assembly (hours).

$R_n$  = The fire-resistance rating of the individual wall (hours).

$pl$  = Coefficient for thickness of plaster.

Values for  $R_n^{0.59}$  for use in Equation 7-9 are given in Table 722.4.1(3). Coefficients for thickness of plaster shall be selected from Table 722.4.1(4) based on the

actual thickness of plaster applied to the wall or partition and whether one or two sides of the wall are plastered.

**TABLE 722.4.1(3)**  
**VALUES OF  $R_n^{0.59}$**

$R_n^{0.59}$	$R$ (hours)
1	1.0
2	1.50
3	1.91
4	2.27

**TABLE 722.4.1(4)**  
**COEFFICIENTS FOR PLASTER,  $pl^a$**

THICKNESS OF PLASTER (inch)	ONE SIDE	TWO SIDES
1/2	0.3	0.6
5/8	0.37	0.75
3/4	0.45	0.90

For SI: 1 inch = 25.4 mm.

a. Values listed in table are for 1:3 sanded gypsum plaster.

**TABLE 722.4.1(5)**  
**REINFORCED MASONRY LINTELS**

NOMINAL LINTEL WIDTH (inches)	MINIMUM LONGITUDINAL REINFORCEMENT COVER FOR FIRE RESISTANCE (inches)			
	1 hour	2 hours	3 hours	4 hours
6	1 1/2	2	NP	NP
8	1 1/2	1 1/2	1 3/4	3
10 or more	1 1/2	1 1/2	1 1/2	1 3/4

For SI: 1 inch = 25.4 mm.

NP = Not permitted.

**TABLE 722.4.1(6)**  
**REINFORCED CLAY MASONRY COLUMNS**

COLUMN SIZE	FIRE-RESISTANCE RATING (hours)			
	1	2	3	4
Minimum column dimension (inches)	8	10	12	14

For SI: 1 inch = 25.4 mm.

**722.4.1.3 Multiwythe walls with airspace.** Where a continuous airspace separates multiple wythes of the wall or partition, the total fire-resistance rating shall be determined by the formula:

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59} + as)^{1.7} \quad (\text{Equation 7-10})$$

where:

$R$  = The fire-resistance rating of the assembly (hours).

$R_1, R_2$  and  $R_n$  = The fire-resistance rating of the individual wythes (hours).

$as$  = Coefficient for continuous airspace.

Values for  $R_n^{0.59}$  for use in Equation 7-10 are given in Table 722.4.1(3). The coefficient for each continuous airspace of  $\frac{1}{2}$  inch to  $3\frac{1}{2}$  inches (12.7 to 89 mm) separating two individual wythes shall be 0.3.

**722.4.1.4 Nonsymmetrical assemblies.** For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side to be the fire-exposed side of the wall. The fire resistance of the wall shall not exceed the lower of the two values determined.

**Exception:** For exterior walls with a fire separation distance greater than 5 feet (1524 mm), the fire shall be assumed to occur on the interior side only.

**722.4.2 Multiwythe walls.** The fire-resistance rating for walls or partitions consisting of two or more dissimilar wythes shall be permitted to be determined by the formula:

$$R = (R_1^{0.59} + R_2^{0.59} + \dots + R_n^{0.59})^{1.7} \quad (\text{Equation 7-11})$$

where:

$R$  = The fire-resistance rating of the assembly (hours).

$R_1, R_2$  and  $R_n$  = The fire-resistance rating of the individual wythes (hours).

Values for  $R_n^{0.59}$  for use in Equation 7-11 are given in Table 722.4.1(3).

**722.4.2.1 Multiwythe walls of different material.** For walls that consist of two or more wythes of different materials (concrete or concrete masonry units) in combination with clay masonry units, the fire-resistance rating of the different materials shall be permitted to be determined from Table 722.2.1.1 for concrete; Table 722.3.2 for concrete masonry units or Table 722.4.1(1) or 722.4.1(2) for clay and tile masonry units.

**722.4.3 Reinforced clay masonry lintels.** Fire-resistance ratings for clay masonry lintels shall be determined based on the nominal width of the lintel and the minimum covering for the longitudinal reinforcement in accordance with Table 722.4.1(5).

**722.4.4 Reinforced clay masonry columns.** The fire-resistance ratings shall be determined based on the last plan dimension of the column in accordance with Table 722.4.1(6). The minimum cover for longitudinal reinforcement shall be 2 inches (51 mm).

**722.5 Steel assemblies.** The provisions of this section contain procedures by which the fire-resistance ratings of steel assemblies are established by calculations.

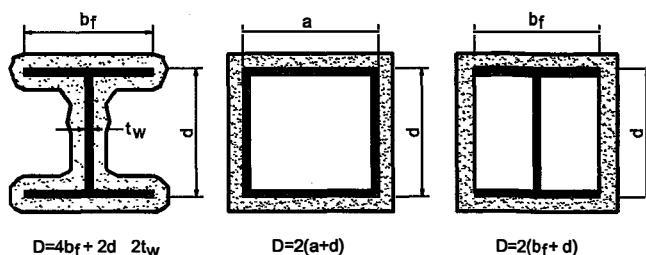
**722.5.1 Structural steel columns.** The fire-resistance ratings of steel columns shall be based on the size of the element and the type of protection provided in accordance with this section.

**722.5.1.1 General.** These procedures establish a basis for determining the fire resistance of column assemblies as a function of the thickness of fire-resistant material and, the weight,  $W$ , and heated perimeter,  $D$ , of steel columns. As used in these sections,  $W$  is the average weight of a structural steel column in pounds per linear foot. The heated perimeter,  $D$ , is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 722.5.1(1).

**722.5.1.1.1 Nonload-bearing protection.** The application of these procedures shall be limited to column assemblies in which the fire-resistant material is not designed to carry any of the load acting on the column.

**722.5.1.1.2 Embedments.** In the absence of substantiating fire-endurance test results, ducts, conduit, piping, and similar mechanical, electrical, and plumbing installations shall not be embedded in any required fire-resistant materials.

**722.5.1.1.3 Weight-to-perimeter ratio.** Table 722.5.1(1) contains weight-to-heated-perimeter ratios ( $W/D$ ) for both contour and box fire-resistant profiles, for the wide flange shapes most often used as columns. For different fire-resistant protection profiles or column cross sections, the weight-to-



**FIGURE 722.5.1(1)**  
**DETERMINATION OF THE HEATED PERIMETER OF STRUCTURAL STEEL COLUMNS**

heated-perimeter ratios ( $W/D$ ) shall be determined in accordance with the definitions given in this section.

**722.5.1.2 Gypsum wallboard protection.** The fire resistance of structural steel columns with weight-to-heated-perimeter ratios ( $W/D$ ) less than or equal to 3.65 and which are protected with Type X gypsum wallboard shall be permitted to be determined from the following expression:

$$R = 130 \left[ \frac{h(W'/D)^{0.75}}{2} \right] \quad (\text{Equation 7-12})$$

where:

$R$  = Fire resistance (minutes).

$h$  = Total thickness of gypsum wallboard (inches).

$D$  = Heated perimeter of the structural steel column (inches).

$W'$  = Total weight of the structural steel column and gypsum wallboard protection (pounds per linear foot).

$$W' = W + 50hD/144.$$

**722.5.1.2.1 Attachment.** The gypsum wallboard shall be supported as illustrated in either Figure 722.5.1(2) for fire-resistance ratings of 4 hours or less, or Figure 722.5.1(3) for fire-resistance ratings of 3 hours or less.

**722.5.1.2.2 Gypsum wallboard equivalent to concrete.** The determination of the fire resistance of structural steel columns from Figure 722.5.1(4) is permitted for various thicknesses of gypsum wallboard as a function of the weight-to-heated-perimeter ratio ( $W/D$ ) of the column. For structural steel columns with weight-to-heated-perimeter ratios ( $W/D$ ) greater than 3.65, the thickness of gypsum wallboard required for specified fire-resistance ratings shall be the same as the thickness determined for a W14 x 233 wide flange shape.

**722.5.1.3 Sprayed fire-resistant materials.** The fire resistance of wide-flange structural steel columns protected with sprayed fire-resistant materials, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1(W/D) + C_2]h \quad (\text{Equation 7-13})$$

where:

$R$  = Fire resistance (minutes).

$h$  = Thickness of sprayed fire-resistant material (inches).

$D$  = Heated perimeter of the structural steel column (inches).

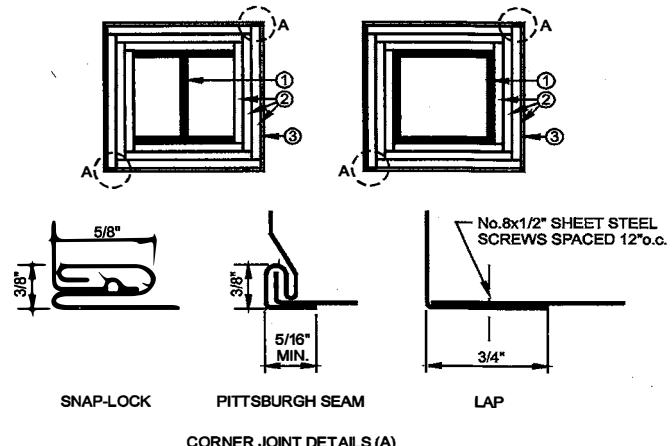
$C_1$  and  $C_2$  = Material-dependent constants.

$W$  = Weight of structural steel columns (pounds per linear foot).

The fire resistance of structural steel columns protected with intumescent or mastic fire-resistant coatings

shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

**722.5.1.3.1 Material-dependent constants.** The material-dependent constants,  $C_1$  and  $C_2$ , shall be determined for specific fire-resistant materials on the basis of standard fire endurance tests in accordance with Section 703.2. Unless evidence is submitted to the building official substantiating a broader application, this expression shall be limited to determining the fire resistance of structural steel columns with weight-to-heated-perimeter ratios ( $W/D$ ) between the largest and smallest columns for which standard fire-resistance test results are available.



**FIGURE 722.5.1(2)**  
GYPSUM WALLBOARD PROTECTED STRUCTURAL STEEL  
COLUMNS WITH SHEET STEEL COLUMN COVERS

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2. Type X gypsum wallboard in accordance with ASTM C 1396. For single layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire resistance rating and the weight to heated perimeter ratio ( $W/D$ ) of the column. For fire resistance ratings of 2 hours or less, one of the required layers of gypsum wallboard may be applied to the exterior of the sheet steel column covers with 1 inch long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149 inch minimum thickness galvanized steel corner beads with 1 1/2 inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.

3. For fire resistance ratings of 3 hours or less, the column covers shall be fabricated from 0.0239 inch minimum thickness galvanized or stainless steel. For 4 hour fire resistance ratings, the column covers shall be fabricated from 0.0239 inch minimum thickness stainless steel. The column covers shall be erected with the Snap Lock or Pittsburgh joint details.

For fire resistance ratings of 2 hours or less, column covers fabricated from 0.0269 inch minimum thickness galvanized or stainless steel shall be permitted to be erected with lap joints. The lap joints shall be permitted to be located anywhere around the perimeter of the column cover. The lap joints shall be secured with 1/2 inch long No. 8 sheet metal screws spaced 12 inches on center.

The column covers shall be provided with a minimum expansion clearance of 1/8 inch per linear foot between the ends of the cover and any restraining construction.

## FIRE AND SMOKE PROTECTION FEATURES

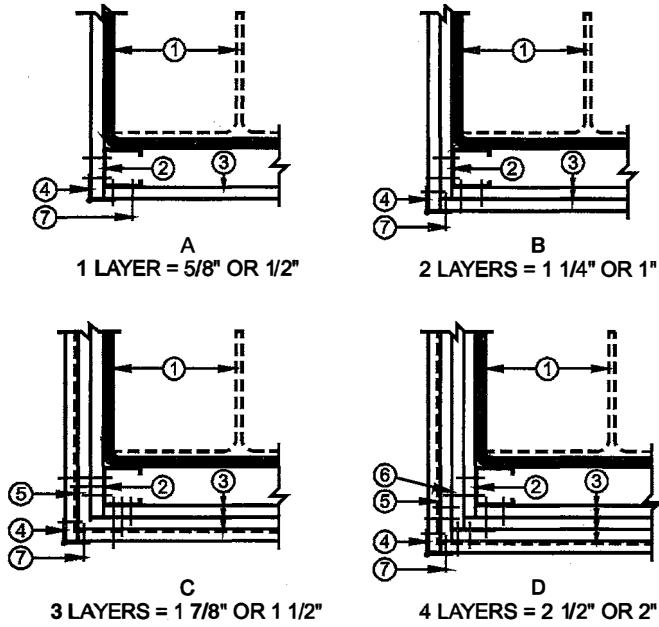


FIGURE 722.5.1(3)

### GYPSUM WALLBOARD PROTECTED STRUCTURAL STEEL COLUMNS WITH STEEL STUD/SCREW ATTACHMENT SYSTEM

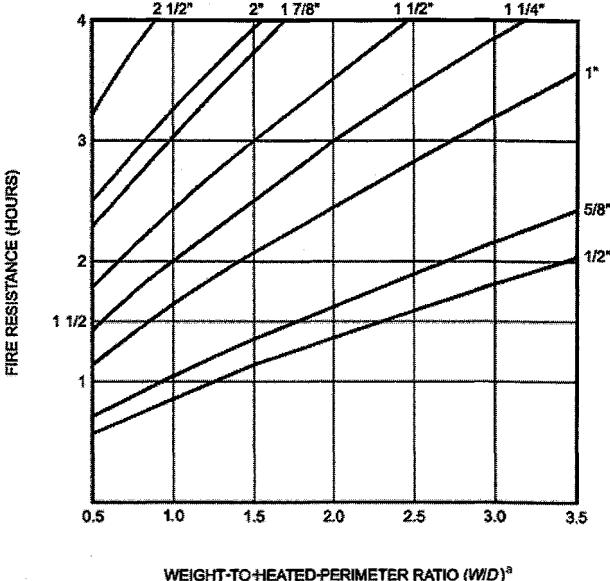
For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

1. Structural steel column, either wide flange or tubular shapes.
2.  $1\frac{5}{8}$  inch deep studs fabricated from 0.0179 inch minimum thickness galvanized steel with  $1\frac{5}{16}$  or  $1\frac{7}{16}$  inch legs. The length of the steel studs shall be  $\frac{1}{2}$  inch less than the height of the assembly.
3. Type X gypsum wallboard in accordance with ASTM C 1396. For single layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire resistance rating and the weight to heated perimeter ratio ( $W/D$ ) of the column.
4. Galvanized 0.0149 inch minimum thickness steel corner beads with  $1\frac{1}{2}$  inch legs attached to the wallboard with 1 inch long Type S screws spaced 12 inches on center.
5. No. 18 SWG steel tie wires spaced 24 inches on center.
6. Sheet metal angles with 2 inch legs fabricated from 0.0221 inch minimum thickness galvanized steel.
7. Type S screws, 1 inch long, shall be used for attaching the first layer of wallboard to the steel studs and the third layer to the sheet metal angles at 24 inches on center. Type S screws  $1\frac{1}{4}$  inch long shall be used for attaching the second layer of wallboard to the steel studs and the fourth layer to the sheet metal angles at 12 inches on center. Type S screws  $2\frac{1}{4}$  inches long shall be used for attaching the third layer of wallboard to the steel studs at 12 inches on center.

**722.5.1.3.2 Identification.** Sprayed fire-resistant materials shall be identified by density and thickness required for a given fire-resistance rating.

**722.5.1.4 Concrete-protected columns.** The fire resistance of structural steel columns protected with concrete, as illustrated in Figure 722.5.1(6) (a) and (b), shall be permitted to be determined from the following expression:

$$R = R_o(1 + 0.03_m) \quad (\text{Equation 7-14})$$



For SI: 1 inch = 25.4 mm, 1 pound per linear foot/inch = 0.059 kg/m/mm.

FIGURE 722.5.1(4)  
FIRE RESISTANCE OF STRUCTURAL STEEL COLUMNS  
PROTECTED WITH VARIOUS THICKNESSES OF TYPE X  
GYPSUM WALLBOARD

- a. The  $W/D$  ratios for typical wide flange columns are listed in Table 721.5.1(1). For other column shapes, the  $W/D$  ratios shall be determined in accordance with Section 721.5.1.1.

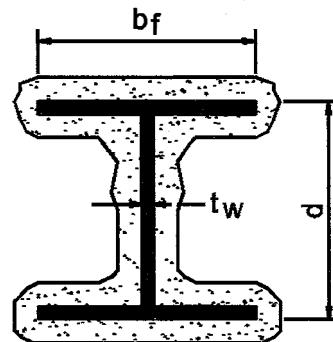


FIGURE 721.5.1(5)  
WIDE FLANGE STRUCTURE STEEL COLUMNS WITH  
SPRAYED FIRE-RESISTANT MATERIALS

where:

$$R_o = 10 (W/D)^{0.7} + 17 (h^{1.6}/k_c^{0.2}) \times [1 + 26 \{H/p_c c_e h (L + h)\}^{0.8}]$$

As used in these expressions:

$R$  = Fire endurance at equilibrium moisture conditions (minutes).

$R_o$  = Fire endurance at zero moisture content (minutes).

$m$  = Equilibrium moisture content of the concrete by volume (percent).  
 $W$  = Average weight of the steel column (pounds per linear foot).  
 $D$  = Heated perimeter of the steel column (inches).  
 $h$  = Thickness of the concrete cover (inches).  
 $k_c$  = Ambient temperature thermal conductivity of the concrete (Btu/hr ft °F).

$H$  = Ambient temperature thermal capacity of the steel column = 0.11W (Btu/ ft °F).  
 $p_c$  = Concrete density (pounds per cubic foot).  
 $c_c$  = Ambient temperature specific heat of concrete (Btu/lb °F).  
 $L$  = Interior dimension of one side of a square concrete box protection (inches).

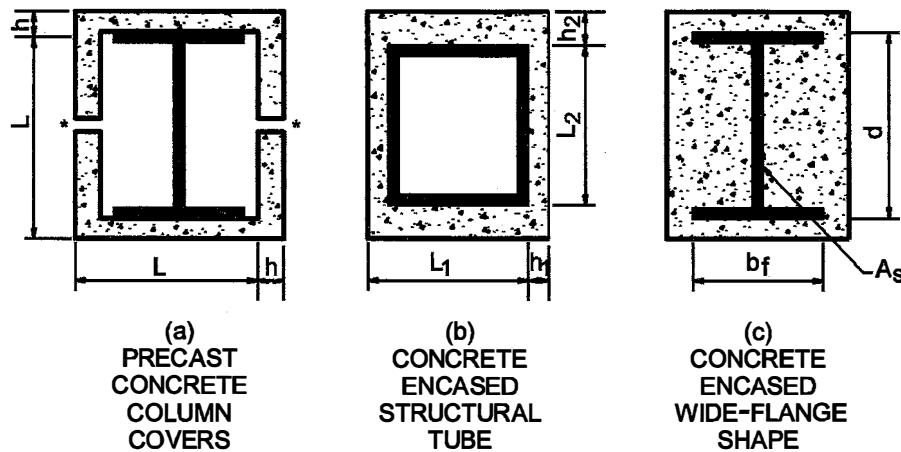
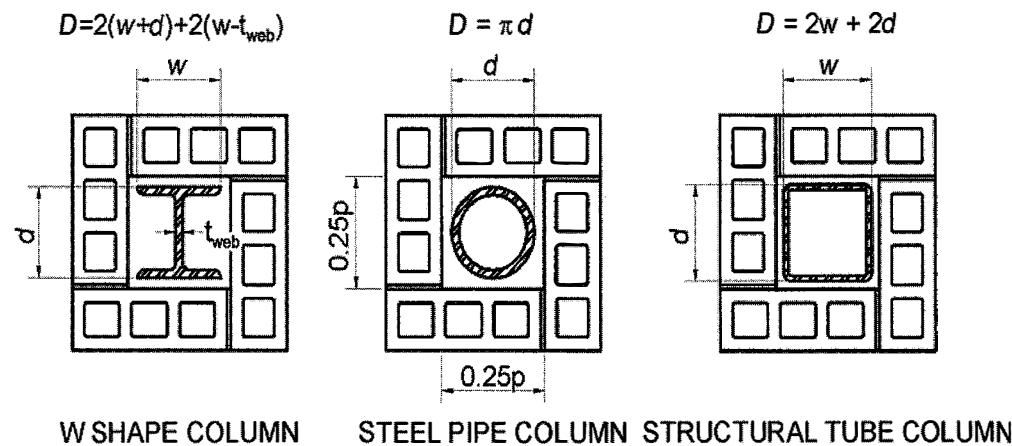


FIGURE 722.5.1(6)  
CONCRETE PROTECTED STRUCTURAL STEEL COLUMNS<sup>a,b</sup>

a. When the inside perimeter of the concrete protection is not square,  $L$  shall be taken as the average of  $L_1$  and  $L_2$ . When the thickness of concrete cover is not constant,  $h$  shall be taken as the average of  $h_1$  and  $h_2$ .

b. Joints shall be protected with a minimum 1 inch thickness of ceramic fiber blanket but in no case less than one half the thickness of the column cover (see Section 722.2.1.3).



For SI: 1 inch = 25.4 mm.

$d$  = Depth of a wide flange column, outside diameter of pipe column, or outside dimension of structural tubing column (inches).

$t_{web}$  = Thickness of web of wide flange column (inches).

$w$  = Width of flange of wide flange column (inches).

FIGURE 722.5.1(7)  
CONCRETE OR CLAY MASONRY PROTECTED STRUCTURAL STEEL COLUMNS

**FIRE AND SMOKE PROTECTION FEATURES**
**TABLE 722.5.1(1)**  
**W/D RATIOS FOR STEEL COLUMNS**

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W14 x 233	2.55	3.65	W10 x 112	1.81	2.57
x 211	2.32	3.35	x 100	1.64	2.33
x 193	2.14	3.09	x 88	1.45	2.08
x 176	1.96	2.85	x 77	1.28	1.85
x 159	1.78	2.60	x 68	1.15	1.66
x 145	1.64	2.39	x 60	1.01	1.48
x 132	1.56	2.25	x 54	0.922	1.34
x 120	1.42	2.06	x 49	0.84	1.23
x 109	1.29	1.88	x 45	0.888	1.24
x 99	1.18	1.72	x 39	0.78	1.09
x 90	1.08	1.58	x 33	0.661	0.93
x 82	1.23	1.68			
x 74	1.12	1.53	W8 x 67	1.37	1.94
x 68	1.04	1.41	x 58	1.20	1.71
x 61	0.928	1.28	x 48	1.00	1.44
x 53	0.915	1.21	x 40	0.849	1.23
x 48	0.835	1.10	x 35	0.749	1.08
x 43	0.752	0.99	x 31	0.665	0.97
			x 28	0.688	0.96
W12 x 190	2.50	3.51	x 24	0.591	0.83
x 170	2.26	3.20	x 21	0.577	0.77
x 152	2.04	2.90	x 18	0.499	0.67
x 136	1.86	2.63			
x 120	1.65	2.36	W6 x 25	0.696	1.00
x 106	1.47	2.11	x 20	0.563	0.82
x 96	1.34	1.93	x 16	0.584	0.78
x 87	1.22	1.76	x 15	0.431	0.63
x 79	1.11	1.61	x 12	0.448	0.60
x 72	1.02	1.48	x 9	0.338	0.46
x 65	0.925	1.35			
x 58	0.925	1.31	W5 x 19	0.644	0.93
x 53	0.855	1.20	x 16	0.55	0.80
x 50	0.909	1.23			
x 45	0.829	1.12	W4 x 13	0.556	0.79
x 40	0.734	1.00			

For SI: 1 pound per linear foot per inch = 0.059 kg/m/mm.

**TABLE 722.5.1(2)**  
**PROPERTIES OF CONCRETE**

PROPERTY	NORMAL-WEIGHT CONCRETE	STRUCTURAL LIGHTWEIGHT CONCRETE
Thermal conductivity ( $k_c$ )	0.95 Btu/hr • ft • °F	0.35 Btu/hr • ft • °F
Specific heat ( $c_c$ )	0.20 Btu/lb °F	0.20 Btu/lb °F
Density ( $P_c$ )	145 lb/ft <sup>3</sup>	110 lb/ft <sup>3</sup>
Equilibrium (free) moisture content (m) by volume	4%	5%

 For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lb/ft<sup>3</sup> = 16.0185 kg/m<sup>3</sup>, Btu/hr • ft • °F = 1.731 W/(m • K).

**TABLE 722.5.1(3)**  
**THERMAL CONDUCTIVITY OF CONCRETE OR CLAY MASONRY UNITS**

DENSITY ( $d_m$ ) OF UNITS (lb/ft <sup>3</sup> )	THERMAL CONDUCTIVITY (K) OF UNITS (Btu/hr · ft · °F)
<b>Concrete Masonry Units</b>	
80	0.207
85	0.228
90	0.252
95	0.278
100	0.308
105	0.340
110	0.376
115	0.416
120	0.459
125	0.508
130	0.561
135	0.620
140	0.685
145	0.758
150	0.837
<b>Clay Masonry Units</b>	
120	1.25
130	2.25

For SI: 1 pound per cubic foot = 16.0185 kg/m<sup>3</sup>, Btu/hr · ft · °F = 1.731 W/(m · K).

**TABLE 722.5.1(4)**  
**WEIGHT-TO-HEATED-PERIMETER RATIOS (W/D) FOR TYPICAL WIDE FLANGE BEAM AND GIRDER SHAPES**

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W36 x 300	2.50	3.33	W24 x 68	0.942	1.21
x 280	2.35	3.12	x 62	0.934	1.14
x 260	2.18	2.92	x 55	0.828	1.02
x 245	2.08	2.76			
x 230	1.95	2.61	W21 x 147	1.87	2.60
x 210	1.96	2.45	x 132	1.68	2.35
x 194	1.81	2.28	x 122	1.57	2.19
x 182	1.72	2.15	x 111	1.43	2.01
x 170	1.60	2.01	x 101	1.30	1.84
x 160	1.51	1.90	x 93	1.40	1.80
x 150	1.43	1.79	x 83	1.26	1.62
x 135	1.29	1.63	x 73	1.11	1.44
			x 68	1.04	1.35

*(continued)*

FIRE AND SMOKE PROTECTION FEATURES

TABLE 722.5.1(4)—continued  
WEIGHT-TO-HEATED-PERIMETER RATIOS (W/D) FOR TYPICAL WIDE FLANGE BEAM AND GIRDER SHAPES

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W33 x 241	2.13	2.86	W21 x 62	0.952	1.23
x 221	1.97	2.64	x 57	0.952	1.17
x 201	1.79	2.42	x 50	0.838	1.04
x 152	1.53	1.94	x 44	0.746	0.92
x 141	1.43	1.80			
x 130	1.32	1.67	W18 x 119	1.72	2.42
x 118	1.21	1.53	x 106	1.55	2.18
			x 97	1.42	2.01
W30 x 211	2.01	2.74	x 86	1.27	1.80
x 191	1.85	2.50	x 76	1.13	1.60
x 173	1.66	2.28	x 71	1.22	1.59
x 132	1.47	1.85	x 65	1.13	1.47
x 124	1.39	1.75	x 60	1.04	1.36
x 116	1.30	1.65	x 55	0.963	1.26
x 108	1.21	1.54	x 50	0.88	1.15
x 99	1.12	1.42	x 46	0.878	1.09
			x 40	0.768	0.96
W27 x 178	1.87	2.55	x 35	0.672	0.85
x 161	1.70	2.33			
x 146	1.55	2.12	W16 x 100	1.59	2.25
x 114	1.39	1.76	x 89	1.43	2.03
x 102	1.24	1.59	x 77	1.25	1.78
x 94	1.15	1.47	x 67	1.09	1.56
x 84	1.03	1.33	x 57	1.09	1.43
			x 50	0.962	1.26
			x 45	0.870	1.15
W24 x 162	1.88	2.57	x 40	0.780	1.03
x 146	1.70	2.34	x 36	0.702	0.93
x 131	1.54	2.12	x 31	0.661	0.83
x 117	1.38	1.91	x 26	0.558	0.70
x 104	1.24	1.71			
x 94	1.28	1.63	W14 x 132	1.89	3.00
x 84	1.15	1.47	x 120	1.71	2.75
x 76	1.05	1.34	x 109	1.57	2.52
W14 x 99	1.43	2.31	W10 x 30	0.806	1.12
x 90	1.31	2.11	x 26	0.708	0.98
x 82	1.45	2.12	x 22	0.606	0.84
x 74	1.32	1.93	x 19	0.607	0.78
x 68	1.22	1.78	x 17	0.543	0.70
x 61	1.10	1.61	x 15	0.484	0.63
x 53	1.06	1.48	x 12	0.392	0.51
x 48	0.970	1.35			

(continued)

**TABLE 722.5.1(4)—continued  
WEIGHT-TO-HEATED-PERIMETER RATIOS (W/D) FOR TYPICAL WIDE FLANGE BEAM AND GIRDERS SHAPES**

STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE	STRUCTURAL SHAPE	CONTOUR PROFILE	BOX PROFILE
W14 x 43	0.874	1.22	W8 x 67	1.65	2.55
x 38	0.809	1.09	x 58	1.44	2.26
x 34	0.725	0.98	x 48	1.21	1.91
x 30	0.644	0.87	x 40	1.03	1.63
x 26	0.628	0.79	x 35	0.907	1.44
x 22	0.534	0.68	x 31	0.803	1.29
			x 28	0.819	1.24
W12 x 87	1.47	2.34	x 24	0.704	1.07
x 79	1.34	2.14	x 21	0.675	0.96
x 72	1.23	1.97	x 18	0.583	0.84
x 65	1.11	1.79	x 15	0.551	0.74
x 58	1.10	1.69	x 13	0.483	0.65
x 53	1.02	1.55	x 10	0.375	0.51
x 50	1.06	1.54			
x 45	0.974	1.40	W6 x 25	0.839	1.33
x 40	0.860	1.25	x 20	0.678	1.09
x 35	0.810	1.11	x 16	0.684	0.96
x 30	0.699	0.96	x 15	0.521	0.83
x 26	0.612	0.84	x 12	0.526	0.75
x 22	0.623	0.77	x 9	0.398	0.57
x 19	0.540	0.67			
x 16	0.457	0.57	W5 x 19	0.776	1.24
x 14	0.405	0.50	x 16	0.664	1.07
W10 x 112	2.17	3.38	W4 x 13	0.670	1.05
x 100	1.97	3.07			
x 88	1.74	2.75			
x 77	1.54	2.45			
x 68	1.38	2.20			
x 60	1.22	1.97			
x 54	1.11	1.79			
x 49	1.01	1.64			
x 45	1.06	1.59			
x 39	0.94	1.40			
x 33	0.77	1.20			

For SI: 1 pound per linear foot per inch = 0.059 kg/m/mm.

FIRE AND SMOKE PROTECTION FEATURES

TABLE 722.5.1(5)  
FIRE RESISTANCE OF CONCRETE MASONRY PROTECTED STEEL COLUMNS

COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)				COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)			
		1 hour	2 hours	3 hours	4 hours			1 hour	2 hours	3 hours	4 hours
W14 x 82	80	0.74	1.61	2.36	3.04	W10 x 68	80	0.72	1.58	2.33	3.01
	100	0.89	1.85	2.67	3.40		100	0.87	1.83	2.65	3.38
	110	0.96	1.97	2.81	3.57		110	0.94	1.95	2.79	3.55
	120	1.03	2.08	2.95	3.73		120	1.01	2.06	2.94	3.72
W14 x 68	80	0.83	1.70	2.45	3.13	W10 x 54	80	0.88	1.76	2.53	3.21
	100	0.99	1.95	2.76	3.49		100	1.04	2.01	2.83	3.57
	110	1.06	2.06	2.91	3.66		110	1.11	2.12	2.98	3.73
	120	1.14	2.18	3.05	3.82		120	1.19	2.24	3.12	3.90
W14 x 53	80	0.91	1.81	2.58	3.27	W10 x 45	80	0.92	1.83	2.60	3.30
	100	1.07	2.05	2.88	3.62		100	1.08	2.07	2.90	3.64
	110	1.15	2.17	3.02	3.78		110	1.16	2.18	3.04	3.80
	120	1.22	2.28	3.16	3.94		120	1.23	2.29	3.18	3.96
W14 x 43	80	1.01	1.93	2.71	3.41	W10 x 33	80	1.06	2.00	2.79	3.49
	100	1.17	2.17	3.00	3.74		100	1.22	2.23	3.07	3.81
	110	1.25	2.28	3.14	3.90		110	1.30	2.34	3.20	3.96
	120	1.32	2.38	3.27	4.05		120	1.37	2.44	3.33	4.12
W12 x 72	80	0.81	1.66	2.41	3.09	W8 x 40	80	0.94	1.85	2.63	3.33
	100	0.91	1.88	2.70	3.43		100	1.10	2.10	2.93	3.67
	110	0.99	1.99	2.84	3.60		110	1.18	2.21	3.07	3.83
	120	1.06	2.10	2.98	3.76		120	1.25	2.32	3.20	3.99
W12 x 58	80	0.88	1.76	2.52	3.21	W8 x 31	80	1.06	2.00	2.78	3.49
	100	1.04	2.01	2.83	3.56		100	1.22	2.23	3.07	3.81
	110	1.11	2.12	2.97	3.73		110	1.29	2.33	3.20	3.97
	120	1.19	2.23	3.11	3.89		120	1.36	2.44	3.33	4.12
W12 x 50	80	0.91	1.81	2.58	3.27	W8 x 24	80	1.14	2.09	2.89	3.59
	100	1.07	2.05	2.88	3.62		100	1.29	2.31	3.16	3.90
	110	1.15	2.17	3.02	3.78		110	1.36	2.42	3.28	4.05
	120	1.22	2.28	3.16	3.94		120	1.43	2.52	3.41	4.20
W12 x 40	80	1.01	1.94	2.72	3.41	W8 x 18	80	1.22	2.20	3.01	3.72
	100	1.17	2.17	3.01	3.75		100	1.36	2.40	3.25	4.01
	110	1.25	2.28	3.14	3.90		110	1.42	2.50	3.37	4.14
	120	1.32	2.39	3.27	4.06		120	1.48	2.59	3.49	4.28
4 x 4 x 1/2 wall thickness	80	0.93	1.90	2.71	3.43	4 double extra strong 0.674 wall thickness	80	0.80	1.75	2.56	3.28
	100	1.08	2.13	2.99	3.76		100	0.95	1.99	2.85	3.62
	110	1.16	2.24	3.13	3.91		110	1.02	2.10	2.99	3.78
	120	1.22	2.34	3.26	4.06		120	1.09	2.20	3.12	3.93
4 x 4 x 3/8 wall thickness	80	1.05	2.03	2.84	3.57	4 extra strong 0.337 wall thickness	80	1.12	2.11	2.93	3.65
	100	1.20	2.25	3.11	3.88		100	1.26	2.32	3.19	3.95
	110	1.27	2.35	3.24	4.02		110	1.33	2.42	3.31	4.09
	120	1.34	2.45	3.37	4.17		120	1.40	2.52	3.43	4.23

(continued)

**TABLE 722.5.1(5)—continued**  
**FIRE RESISTANCE OF CONCRETE MASONRY PROTECTED STEEL COLUMNS**

COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)				COLUMN SIZE	CONCRETE MASONRY DENSITY POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CONCRETE MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)			
		1 hour	2 hours	3 hours	4 hours			1 hour	2 hours	3 hours	4 hours
4 × 4 × $\frac{1}{4}$ wall thickness	80	1.21	2.20	3.01	3.73	4 standard 0.237 wall thickness	80	1.26	2.25	3.07	3.79
	100	1.35	2.40	3.26	4.02		100	1.40	2.45	3.31	4.07
	110	1.41	2.50	3.38	4.16		110	1.46	2.55	3.43	4.21
	120	1.48	2.59	3.50	4.30		120	1.53	2.64	3.54	4.34
6 × 6 × $\frac{1}{2}$ wall thickness	80	0.82	1.75	2.54	3.25	5 double extra strong 0.750 wall thickness	80	0.70	1.61	2.40	3.12
	100	0.98	1.99	2.84	3.59		100	0.85	1.86	2.71	3.47
	110	1.05	2.10	2.98	3.75		110	0.91	1.97	2.85	3.63
	120	1.12	2.21	3.11	3.91		120	0.98	2.02	2.99	3.79
6 × 6 × $\frac{3}{8}$ wall thickness	80	0.96	1.91	2.71	3.42	5 extra strong 0.375 wall thickness	80	1.04	2.01	2.83	3.54
	100	1.12	2.14	3.00	3.75		100	1.19	2.23	3.09	3.85
	110	1.19	2.25	3.13	3.90		110	1.26	2.34	3.22	4.00
	120	1.26	2.35	3.26	4.05		120	1.32	2.44	3.34	4.14
6 × 6 × $\frac{1}{4}$ wall thickness	80	1.14	2.11	2.92	3.63	5 standard 0.258 wall thickness	80	1.20	2.19	3.00	3.72
	100	1.29	2.32	3.18	3.93		100	1.34	2.39	3.25	4.00
	110	1.36	2.43	3.30	4.08		110	1.41	2.49	3.37	4.14
	120	1.42	2.52	3.43	4.22		120	1.47	2.58	3.49	4.28
8 × 8 × $\frac{1}{2}$ wall thickness	80	0.77	1.66	2.44	3.13	6 double extra strong 0.864 wall thickness	80	0.59	1.46	2.23	2.92
	100	0.92	1.91	2.75	3.49		100	0.73	1.71	2.54	3.29
	110	1.00	2.02	2.89	3.66		110	0.80	1.82	2.69	3.47
	120	1.07	2.14	3.03	3.82		120	0.86	1.93	2.83	3.63
8 × 8 × $\frac{3}{8}$ wall thickness	80	0.91	1.84	2.63	3.33	6 extra strong 0.432 wall thickness	80	0.94	1.90	2.70	3.42
	100	1.07	2.08	2.92	3.67		100	1.10	2.13	2.98	3.74
	110	1.14	2.19	3.06	3.83		110	1.17	2.23	3.11	3.89
	120	1.21	2.29	3.19	3.98		120	1.24	2.34	3.24	4.04
8 × 8 × $\frac{1}{4}$ wall thickness	80	1.10	2.06	2.86	3.57	6 standard 0.280 wall thickness	80	1.14	2.12	2.93	3.64
	100	1.25	2.28	3.13	3.87		100	1.29	2.33	3.19	3.94
	110	1.32	2.38	3.25	4.02		110	1.36	2.43	3.31	4.08
	120	1.39	2.48	3.38	4.17		120	1.42	2.53	3.43	4.22

For SI: 1 inch = 25.4 mm, 1 pound per cubic feet = 16.02 kg/m<sup>3</sup>.

Note: Tabulated values assume 1 inch air gap between masonry and steel section.

FIRE AND SMOKE PROTECTION FEATURES

TABLE 722.5.1(6)  
FIRE RESISTANCE OF CLAY MASONRY PROTECTED STEEL COLUMNS

COLUMN SIZE	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)				COLUMN SIZE	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)			
		1 hour	2 hours	3 hours	4 hours			1 hour	2 hours	3 hours	4 hours
W14 × 82	120	1.23	2.42	3.41	4.29	W10 × 68	120	1.27	2.46	3.26	4.35
	130	1.40	2.70	3.78	4.74		130	1.44	2.75	3.83	4.80
W14 × 68	120	1.34	2.54	3.54	4.43	W10 × 54	120	1.40	2.61	3.62	4.51
	130	1.51	2.82	3.91	4.87		130	1.58	2.89	3.98	4.95
W14 × 53	120	1.43	2.65	3.65	4.54	W10 × 45	120	1.44	2.66	3.67	4.57
	130	1.61	2.93	4.02	4.98		130	1.62	2.95	4.04	5.01
W14 × 43	120	1.54	2.76	3.77	4.66	W10 × 33	120	1.59	2.82	3.84	4.73
	130	1.72	3.04	4.13	5.09		130	1.77	3.10	4.20	5.13
W12 × 72	120	1.32	2.52	3.51	4.40	W8 × 40	120	1.47	2.70	3.71	4.61
	130	1.50	2.80	3.88	4.84		130	1.65	2.98	4.08	5.04
W12 × 58	120	1.40	2.61	3.61	4.50	W8 × 31	120	1.59	2.82	3.84	4.73
	130	1.57	2.89	3.98	4.94		130	1.77	3.10	4.20	5.17
W12 × 50	120	1.43	2.65	3.66	4.55	W8 × 24	120	1.66	2.90	3.92	4.82
	130	1.61	2.93	4.02	4.99		130	1.84	3.18	4.28	5.25
W12 × 40	120	1.54	2.77	3.78	4.67	W8 × 18	120	1.75	3.00	4.01	4.91
	130	1.72	3.05	4.14	5.10		130	1.93	3.27	4.37	5.34

STEEL TUBING

NOMINAL TUBE SIZE (inches)	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)				NOMINAL PIPE SIZE (inches)	CLAY MASONRY DENSITY, POUNDS PER CUBIC FOOT	MINIMUM REQUIRED EQUIVALENT THICKNESS FOR FIRE-RESISTANCE RATING OF CLAY MASONRY PROTECTION ASSEMBLY, $T_e$ (inches)			
		1 hour	2 hours	3 hours	4 hours			1 hour	2 hours	3 hours	4 hours
4 × 4 × $\frac{1}{2}$ wall thickness	120	1.44	2.72	3.76	4.68	4 double extra strong 0.674 wall thickness	120	1.26	2.55	3.60	4.52
	130	1.62	3.00	4.12	5.11		130	1.42	2.82	3.96	4.95
4 × 4 × $\frac{3}{8}$ wall thickness	120	1.56	2.84	3.88	4.78	4 extra strong 0.337 wall thickness	120	1.60	2.89	3.92	4.83
	130	1.74	3.12	4.23	5.21		130	1.77	3.16	4.28	5.25
4 × 4 × $\frac{1}{4}$ wall thickness	120	1.72	2.99	4.02	4.92	4 standard 0.237 wall thickness	120	1.74	3.02	4.05	4.95
	130	1.89	3.26	4.37	5.34		130	1.92	3.29	4.40	5.37
6 × 6 × $\frac{1}{2}$ wall thickness	120	1.33	2.58	3.62	4.52	5 double extra strong 0.750 wall thickness	120	1.17	2.44	3.48	4.40
	130	1.50	2.86	3.98	4.96		130	1.33	2.72	3.84	4.83
6 × 6 × $\frac{3}{8}$ wall thickness	120	1.48	2.74	3.76	4.67	5 extra strong 0.375 wall thickness	120	1.55	2.82	3.85	4.76
	130	1.65	3.01	4.13	5.10		130	1.72	3.09	4.21	5.18
6 × 6 × $\frac{1}{4}$ wall thickness	120	1.66	2.91	3.94	4.84	5 standard 0.258 wall thickness	120	1.71	2.97	4.00	4.90
	130	1.83	3.19	4.30	5.27		130	1.88	3.24	4.35	5.32
8 × 8 × $\frac{1}{2}$ wall thickness	120	1.27	2.50	3.52	4.42	6 double extra strong 0.864 wall thickness	120	1.04	2.28	3.32	4.23
	130	1.44	2.78	3.89	4.86		130	1.19	2.60	3.68	4.67
8 × 8 × $\frac{3}{8}$ wall thickness	120	1.43	2.67	3.69	4.59	6 extra strong 0.432 wall thickness	120	1.45	2.71	3.75	4.65
	130	1.60	2.95	4.05	5.02		130	1.62	2.99	4.10	5.08
8 × 8 × $\frac{1}{4}$ wall thickness	120	1.62	2.87	3.89	4.78	6 standard 0.280 wall thickness	120	1.65	2.91	3.94	4.84
	130	1.79	3.14	4.24	5.21		130	1.82	3.19	4.30	5.27

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.02 kg/m<sup>3</sup>.

TABLE 722.5.1(7)

MINIMUM COVER (inch) FOR STEEL COLUMNS ENCASED IN NORMAL-WEIGHT CONCRETE<sup>a</sup> [FIGURE 722.5.1(6)(c)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)				
	1	1½	2	3	4
W14 × 233	1	1½	1	1½	2
× 176				2½	
× 132			2		
× 90			1½	3	
× 61					
× 48			2½		
× 43					
W12 × 152	1	1½	1	2	2½
× 96			1½	3	
× 65					
× 50			2½		
× 40					
W10 × 88	1	1½	2	3	
× 49					
× 45			2½		
× 39			2	3½	
× 33					
W8 × 67	1	1½	1	2½	3
× 58			1½	3½	
× 48					
× 31			2	3	
× 21			3	4	
× 18					
W6 × 25	1	1½	1½	2	3½
× 20			2	3	
× 16					
× 15			2½	3½	
× 9					

For SI: 1 inch = 25.4 mm.

- a. The tabulated thicknesses are based upon the assumed properties of normal weight concrete given in Table 722.5.1(2).

TABLE 722.5.1(8)

MINIMUM COVER (inch) FOR STEEL COLUMNS ENCASED IN STRUCTURAL LIGHTWEIGHT CONCRETE<sup>a</sup> [FIGURE 722.5.1(6)(c)]

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (HOURS)				
	1	1½	2	3	4
W14 × 233	1	1	1	1	1½
× 193					2
× 74			1½	2	2½
× 61					
× 43			1½		
W12 × 65			1	1½	2
× 53				2	2½
× 40	1	1	1½	2	2½
W10 × 112			1	1½	2
× 88				2	2½
× 60			1½		
× 33					
W8 × 35	1	1	1	2	2½
× 28				1½	3
× 24			1½		
× 18				2½	

For SI: 1 inch = 25.4 mm.

- a. The tabulated thicknesses are based upon the assumed properties of structural lightweight concrete given in Table 722.5.1(2).

FIRE AND SMOKE PROTECTION FEATURES

**TABLE 722.5.1(9)**  
**MINIMUM COVER (inch) FOR STEEL COLUMNS IN NORMAL-WEIGHT PRECAST COVERS<sup>a</sup> [FIGURE 722.5.1(6)(a)]**

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)				
	1	1½	2	3	4
W14 x 233	1½	1½	1½	2½	3
× 211			2	3½	
× 176			3	4	
× 145			3½	4½	
× 109		2	2½	3½	
× 99			3½	4	
× 61			4½		
× 43					
W12 x 190	1½	1½	1½	2½	3½
× 152			2	3	4
× 120			3		
× 96			4		
× 87		2	2½	3½	
× 58			3½	4½	
× 40			4½		
W10 x 112		1½	1½	2	3½
× 88			2	3	4
× 77			3½		
× 54			4½		
× 33					
W8 x 67	1½	1½	1½	2	3
× 58			2	2½	4
× 48			3½		
× 28			4½		
× 21		2½	3	4	
× 18			4		
W6 x 25		1½	2	2½	3½
× 20			2½	3	4½
× 16			3		
× 12			4		
× 9				5	

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of normal weight concrete given in Table 722.5.1(2).

**TABLE 722.5.1(10)**  
**MINIMUM COVER (inch) FOR STEEL COLUMNS IN STRUCTURAL LIGHTWEIGHT PRECAST COVERS<sup>a</sup> [FIGURE 722.5.1(6)(a)]**

STRUCTURAL SHAPE	FIRE-RESISTANCE RATING (hours)				
	1	1½	2	3	4
W14 x 233	1½	1½		2	2½
× 176				1½	3
× 145				2½	
× 132				3	
× 109		2		2	
× 99				3	
× 68				3½	
× 43					
W12 x 190	1½	1½		2	2½
× 152				1½	3
× 136				2½	
× 106				3	
× 96		2		2	
× 87				3	
× 65				3½	
× 40					
W10 x 112	1½	1½		2	2½
× 100				1½	3
× 88				2½	
× 77				3	
× 60		2		2	
× 39				3	
× 33				3½	
W8 x 67	1½	1½		1½	2½
× 48				2	3
× 35				3	3½
× 28				4	
× 18		2		2½	
W6 x 25	1½	1½		2	2½
× 20				3	3½
× 16				4	
× 12				3½	
× 9		2		3½	4

For SI: 1 inch = 25.4 mm.

a. The tabulated thicknesses are based upon the assumed properties of structural lightweight concrete given in Table 722.5.1(2).

**722.5.1.4.1 Reentrant space filled.** For wide-flange steel columns completely encased in concrete with all reentrant spaces filled [Figure 722.5.1(6)(c)], the thermal capacity of the concrete within the reentrant spaces shall be permitted to be added to the thermal capacity of the steel column, as follows:

$$H = 0.11 W + (p_c c_c / 144) (b_f d - A_s) \quad (\text{Equation 7-15})$$

where:

$b_f$  = Flange width of the steel column (inches).

$d$  = Depth of the steel column (inches).

$A_s$  = Cross-sectional area of the steel column (square inches).

**722.5.1.4.2 Concrete properties unknown.** If specific data on the properties of concrete are not available, the values given in Table 722.5.1(2) are permitted.

**722.5.1.4.3 Minimum concrete cover.** For structural steel column encased in concrete with all reentrant spaces filled, Figure 722.5.1(6)(c) and Tables 722.5.1(7) and 722.5.1(8) indicate the thickness of concrete cover required for various fire-resistance ratings for typical wide-flange sections. The thicknesses of concrete indicated in these tables also apply to structural steel columns larger than those listed.

**722.5.1.4.4 Minimum precast concrete cover.** For structural steel columns protected with precast concrete column covers as shown in Figure 722.5.1(6)(a), Tables 722.5.1(9) and 722.5.1(10) indicate the thickness of the column covers required for various fire-resistance ratings for typical wide-flange shapes. The thicknesses of concrete given in these tables also apply to structural steel columns larger than those listed.

**722.5.1.4.5 Masonry protection.** The fire resistance of structural steel columns protected with concrete masonry units or clay masonry units as illustrated in Figure 722.5.1(7), shall be permitted to be determined from the following expression:

$$R = 0.17 (W/D)^{0.7} + [0.285 (T_e^{1.6}/K^{0.2})] [1.0 + 42.7 \{(A_s/d_m T_e)/(0.25p + T_e)\}^{0.8}] \quad (\text{Equation 7-16})$$

where:

$R$  = Fire-resistance rating of column assembly (hours).

$W$  = Average weight of steel column (pounds per foot).

$D$  = Heated perimeter of steel column (inches) [see Figure 722.5.1(7)].

$T_e$  = Equivalent thickness of concrete or clay masonry unit (inches) (see Table 722.3.2 Note a or Section 722.4.1).

$K$  = Thermal conductivity of concrete or clay masonry unit (Btu/hr · ft · °F) [see Table 722.5.1(3)].

$A_s$  = Cross-sectional area of steel column (square inches).

$d_m$  = Density of the concrete or clay masonry unit (pounds per cubic foot).

$p$  = Inner perimeter of concrete or clay masonry protection (inches) [see Figure 722.5.1(7)].

**722.5.1.4.6 Equivalent concrete masonry thickness.** For structural steel columns protected with concrete masonry, Table 722.5.1(5) gives the equivalent thickness of concrete masonry required for various fire-resistance ratings for typical column shapes. For structural steel columns protected with clay masonry, Table 722.5.1(6) gives the equivalent thickness of concrete masonry required for various fire-resistance ratings for typical column shapes.

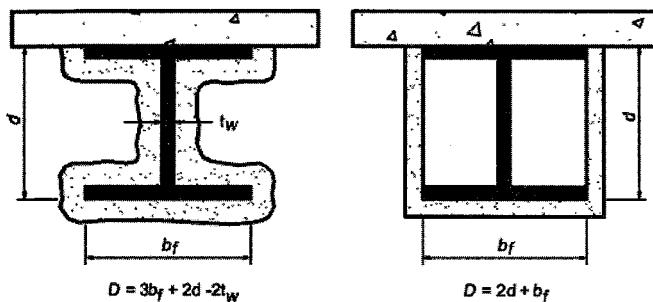
**722.5.2 Structural steel beams and girders.** The fire-resistance ratings of steel beams and girders shall be based upon the size of the element and the type of protection provided in accordance with this section.

**722.5.2.1 Determination of fire resistance.** These procedures establish a basis for determining resistance of structural steel beams and girders which differ in size from that specified in approved fire-resistance-rated assemblies as a function of the thickness of fire-resistant material and the weight ( $W$ ) and heated perimeter ( $D$ ) of the beam or girder. As used in these sections,  $W$  is the average weight of a structural steel member in pounds per linear foot (plf). The heated perimeter,  $D$ , is the inside perimeter of the fire-resistant material in inches as illustrated in Figure 722.5.2.

**722.5.2.1.1 Weight-to-heated perimeter.** The weight-to-heated-perimeter ratios ( $W/D$ ), for both contour and box fire-resistant protection profiles, for the wide flange shapes most often used as beams or girders are given in Table 722.5.1(4). For different shapes, the weight-to-heated-perimeter ratios ( $W/D$ ) shall be determined in accordance with the definitions given in this section.

**722.5.2.1.2 Beam and girder substitutions.** Except as provided for in Section 722.5.2.2, structural steel beams in approved fire-resistance-rated assemblies shall be considered the minimum permissible size. Other beam or girder shapes shall be permitted to be substituted provided that the weight-to-heated-perimeter ratio ( $W/D$ ) of the substitute beam is equal to or greater than that of the beam specified in the approved assembly.

**722.5.2.2 Sprayed fire-resistant materials.** The provisions in this section apply to structural steel beams and girders protected with sprayed fire-resistant materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in approved unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the fire-



**FIGURE 722.5.2**  
DETERMINATION OF THE HEATED PERIMETER OF  
STRUCTURAL STEEL BEAMS AND GIRDERS

resistant material is adjusted in accordance with the following expression:

$$h_2 = h_1 [(W_1/D_1) + 0.60] / [(W_2/D_2) + 0.60] \quad (\text{Equation 7-17})$$

where:

$h$  = Thickness of sprayed fire-resistant material in inches.

$W$  = Weight of the structural steel beam or girder in pounds per linear foot.

$D$  = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistant material thickness in the approved assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistant material.

The fire resistance of structural steel beams and girders protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

**722.5.2.2.1 Minimum thickness.** The use of Equation 7-17 is subject to the following conditions:

1. The weight-to-heated-perimeter ratio for the substitute beam or girder ( $W_2/D_2$ ) shall not be less than 0.37.
2. The thickness of fire protection materials calculated for the substitute beam or girder ( $T_2$ ) shall not be less than  $\frac{3}{8}$  inch (9.5 mm).
3. The unrestrained or restrained beam rating shall not be less than 1 hour.
4. When used to adjust the material thickness for a restrained beam, the use of this procedure is limited to steel sections classified as compact in accordance with the AISC *Specification for Structural Steel Buildings*, (AISC 360-05).

**722.5.2.3 Structural steel trusses.** The fire resistance of structural steel trusses protected with fire-resistant materials sprayed to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-

resistant material shall be determined in accordance with Section 722.5.1.3. The weight-to-heated-perimeter ratio ( $W/D$ ) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 722.5.1.1. The weight-to-heated-perimeter ratio ( $W/D$ ) of truss elements that directly support floor or roof assembly shall be determined on the same basis as beams and girders, as specified in Section 722.5.2.1.

The fire resistance of structural steel trusses protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

**722.6 Wood assemblies.** The provisions of this section contain procedures by which the fire-resistance ratings of wood assemblies are established by calculations.

**722.6.1 General.** This section contains procedures for calculating the fire-resistance ratings of walls, floor/ceiling and roof/ceiling assemblies based in part on the standard method of testing referenced in Section 703.2.

**722.6.1.1 Maximum fire-resistance rating.** Fire resistance ratings calculated for assemblies using the methods in Section 722.6 shall be limited to a maximum of 1 hour.

**722.6.1.2 Dissimilar membranes.** Where dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

**722.6.2 Walls, floors and roofs.** These procedures apply to both load-bearing and nonload-bearing assemblies.

**722.6.2.1 Fire-resistance rating of wood frame assemblies.** The fire-resistance rating of a wood frame assembly is equal to the sum of the time assigned to the membrane on the fire-exposed side, the time assigned to the framing members and the time assigned for additional contribution by other protective measures such as insulation. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly.

**722.6.2.2 Time assigned to membranes.** Table 722.6.2(1) indicates the time assigned to membranes on the fire-exposed side.

**722.6.2.3 Exterior walls.** For an exterior wall with a fire separation distance greater than 10 feet (3048 mm), the wall is assigned a rating dependant on the interior membrane and the framing as described in Tables 722.6.2(1) and 722.6.2(2). The membrane on the outside of the nonfire-exposed side of exterior walls with a fire separation distance greater than 10 feet (3048 mm) may consist of sheathing, sheathing paper and siding as described in Table 722.6.2(3).

**722.6.2.4 Floors and roofs.** In the case of a floor or roof, the standard test provides only for testing for fire exposure from below. Except as noted in Section 703.3, Item 5, floor or roof assemblies of wood framing shall have an upper membrane consisting of a subfloor and finished floor conforming to Table 722.6.2(4) or any

other membrane that has a contribution to fire resistance of at least 15 minutes in Table 722.6.2(1).

**722.6.2.5 Additional protection.** Table 722.6.2(5) indicates the time increments to be added to the fire resistance where glass fiber, rockwool, slag mineral wool or cellulose insulation is incorporated in the assembly.

**722.6.2.6 Fastening.** Fastening of wood frame assemblies and the fastening of membranes to the wood framing members shall be done in accordance with Chapter 23.

**722.6.3 Design of fire-resistant exposed wood members.** The fire-resistance rating, in minutes, of timber beams and columns with a minimum nominal dimension of 6 inches (152 mm) is equal to:

Beams:  $2.54Zb [4 -2(b/d)]$  for beams which may be exposed to fire on four sides.  
**(Equation 7-18)**

**TABLE 722.6.2(1)**  
**TIME ASSIGNED TO WALLBOARD MEMBRANES<sup>a, b, c, d</sup>**

DESCRIPTION OF FINISH	TIME <sup>e</sup> (minutes)
$\frac{3}{8}$ -inch wood structural panel bonded with exterior glue	5
$\frac{15}{32}$ -inch wood structural panel bonded with exterior glue	10
$\frac{19}{32}$ -inch wood structural panel bonded with exterior glue	15
$\frac{3}{8}$ -inch gypsum wallboard	10
$\frac{1}{2}$ -inch gypsum wallboard	15
$\frac{5}{8}$ -inch gypsum wallboard	30
$\frac{1}{2}$ -inch Type X gypsum wallboard	25
$\frac{5}{8}$ -inch Type X gypsum wallboard	40
Double $\frac{3}{8}$ -inch gypsum wallboard	25
$\frac{1}{2}$ -inch + $\frac{3}{8}$ -inch gypsum wallboard	35
Double $\frac{1}{2}$ -inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

- a. These values apply only when membranes are installed on framing members which are spaced 16 inches o.c. or less.
- b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except  $\frac{5}{8}$  inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.
- c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.
- d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. When dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire resistant (weaker) side.
- e. The time assigned is not a finished rating.

$2.54Zb [4 -(b/d)]$  for beams which may be exposed to fire on three sides.

**(Equation 7-19)**

Columns:  $2.54Zd [3 -(d/b)]$  for columns which may be exposed to fire on four sides

**(Equation 7-20)**

$2.54Zd [3 -(d/2b)]$  for columns which may be exposed to fire on three sides.

**(Equation 7-21)**

where:

*b* = The breadth (width) of a beam or larger side of a column before exposure to fire (inches).

*d* = The depth of a beam or smaller side of a column before exposure to fire (inches).

*Z* = Load factor, based on Figure 722.6.3(1).

**722.6.3.1 Equation 7-21.** Equation 7-21 applies only where the unexposed face represents the smaller side of the column. If a column is recessed into a wall, its full dimension shall be used for the purpose of these calculations.

**722.6.3.2 Allowable loads.** Allowable loads on beams and columns are determined using design values given in AF&PA NDS.

**722.6.3.3 Fastener protection.** Where minimum 1-hour fire resistance is required, connectors and fasteners shall be protected from fire exposure by  $1\frac{1}{2}$  inches (38 mm) of wood, or other approved covering or coating for a 1-hour rating. Typical details for commonly used fasteners and connectors are shown in AITC Technical Note 7.

**722.6.3.4 Minimum size.** Wood members are limited to dimensions of 6 inches (152 mm) nominal or greater. Glued-laminated timber beams utilize standard laminating combinations except that a core lamination is removed. The tension zone is moved inward and the equivalent of an extra nominal 2-inch-thick (51 mm) outer tension lamination is added.

**FIRE AND SMOKE PROTECTION FEATURES**

**TABLE 722.6.2(2)**  
**TIME ASSIGNED FOR CONTRIBUTION OF WOOD FRAME<sup>a, b, c</sup>**

DESCRIPTION	TIME ASSIGNED TO FRAME (minutes)
Wood studs 16 inches o.c.	20
Wood floor and roof joists 16 inches o.c.	10

For SI: 1 inch = 25.4 mm.

- a. This table does not apply to studs or joists spaced more than 16 inches o.c.
- b. All studs shall be nominal 2 x 4 and all joists shall have a nominal thickness of at least 2 inches.
- c. Allowable spans for joists shall be determined in accordance with Sections 2308.8, 2308.10.2 and 2308.10.3.

**TABLE 722.6.2(3)**  
**MEMBRANE<sup>a</sup> ON EXTERIOR FACE OF WOOD STUD WALLS**

SHEATHING	PAPER	EXTERIOR FINISH
$\frac{5}{8}$ -inch T & G lumber		Lumber siding
$\frac{5}{16}$ -inch exterior glue wood structural panel	Sheathing paper	Wood shingles and shakes
$\frac{1}{2}$ -inch gypsum wallboard		$\frac{1}{4}$ -inch wood structural panels-exterior type
$\frac{5}{8}$ -inch gypsum wallboard		$\frac{1}{4}$ -inch hardboard
$\frac{1}{2}$ -inch fiberboard		Metal siding
None	—	Stucco on metal lath
		Masonry veneer
		Vinyl siding
		$\frac{3}{8}$ -inch exterior-grade wood structural panels

For SI: 1 pound/cubic foot = 16.0185 kg/m<sup>3</sup>.

- a. Any combination of sheathing, paper and exterior finish is permitted.

**TABLE 722.6.2(4)**  
**FLOORING OR ROOFING OVER WOOD FRAMING<sup>a</sup>**

ASSEMBLY	STRUCTURAL MEMBERS	SUBFLOOR OR ROOF DECK	FINISHED FLOORING OR ROOFING
Floor	Wood	$\frac{15}{32}$ -inch wood structural panels or $\frac{11}{16}$ -inch T & G softwood	Hardwood or softwood flooring on building paper resilient flooring, parquet floor felted-synthetic fiber floor coverings, carpeting, or ceramic tile on $\frac{3}{8}$ -inch-thick panel-type underlay Ceramic tile on $1\frac{1}{4}$ -inch mortar bed
Roof	Wood	$\frac{15}{32}$ -inch wood structural panels or $\frac{11}{16}$ -inch T & G softwood	Finished roofing material with or without insulation

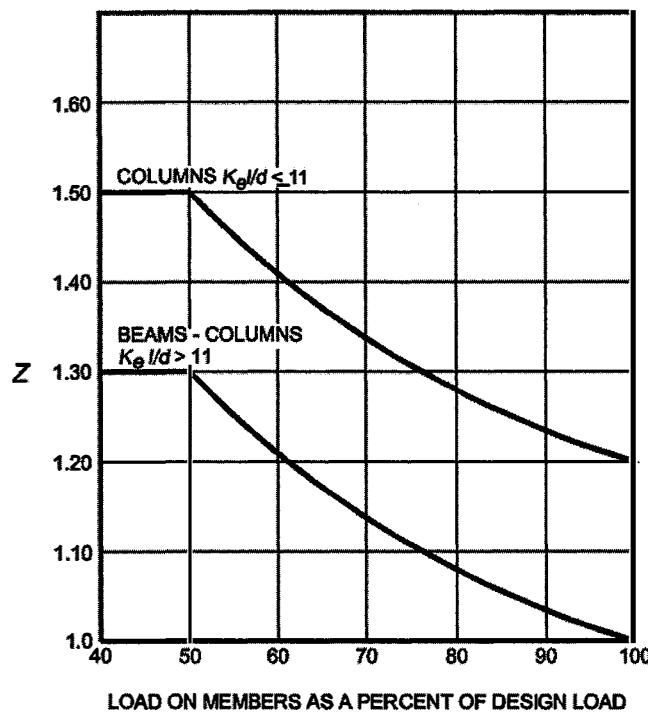
For SI: 1 inch = 25.4 mm.

- a. This table applies only to wood joist construction. It is not applicable to wood truss construction.

**TABLE 722.6.2(5)**  
**TIME ASSIGNED FOR ADDITIONAL PROTECTION**

DESCRIPTION OF ADDITIONAL PROTECTION	FIRE RESISTANCE (minutes)
Add to the fire-resistance rating of wood stud walls if the spaces between the studs are completely filled with glass fiber mineral wool batts weighing not less than 2 pounds per cubic foot (0.6 pound per square foot of wall surface) or rockwool or slag material wool batts weighing not less than 3.3 pounds per cubic foot (1 pound per square foot of wall surface), or cellulose insulation having a nominal density not less than 2.6 pounds per cubic foot.	15

For SI: 1 pound/cubic foot = 16.0185 kg/m<sup>3</sup>.

FIGURE 722.6.3(1)  
LOAD FIGURE

$K_e$  = The effective length factor as noted in Figure 722.6.3(2).  
 $l$  = The unsupported length of columns (inches).

BUCKLING MODES		0.5	0.7	1.0	1.0	2.0	2.0	
THEORETICAL $K_e$ VALUE	RECOMMENDED DESIGN $K_e$ WHEN IDEAL CONDITIONS APPROXIMATED	0.65	0.80	1.2	1.0	2.10	2.4	
END CONDITION CODE		↖↖	ROTATION FIXED, TRANSLATION FIXED					
		↖↖	ROTATION FREE, TRANSLATION FIXED					
		↖↖	ROTATION FIXED, TRANSLATION FREE					
		↖	ROTATION FREE, TRANSLATION FREE					

FIGURE 722.6.3(2)  
EFFECTIVE LENGTH FACTORS



**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 7A – MATERIALS AND CONSTRUCTION**  
**METHODS FOR EXTERIOR WILDFIRE EXPOSURE**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
 See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
<i>Adopt entire chapter</i>		X	X	X																
<i>Adopt entire chapter as amended (amended sections listed below)</i>																				
<i>Adopt only those sections that are listed below</i>																				
<i>Chapter / Section</i>																				



## CHAPTER 7A [SFM]

# MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE

### SECTION 701A SCOPE, PURPOSE AND APPLICATION

**701A.1 Scope.** This chapter applies to building materials, systems and/or assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area as defined in Section 702A.

**701A.2 Purpose.** The purpose of this chapter is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses.

**701A.3 Application.** New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed after the application date shall comply with the provisions of this chapter.

#### Exceptions:

1. Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from an applicable building.
2. Buildings of an accessory character classified as Group U occupancy of any size located least 50 feet from an applicable building.
3. Buildings classified as a Group U Agricultural Building, as defined in Section 202 of this code (see also Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.
4. Additions to and remodels of buildings originally constructed prior to the applicable application date.

**701A.3.1 Application date and where required.** New buildings for which an application for a building permit is submitted on or after July 1, 2008 located in any Fire Hazard Severity Zone or Wildland Interface Fire Area shall comply with all sections of this chapter, including all of the following areas:

1. All unincorporated lands designated by the State Board of Forestry and Fire Protection as State Responsibility Area (SRA) including:
  - 1.1. Moderate Fire Hazard Severity Zones
  - 1.2. High Fire Hazard Severity Zones
  - 1.3. Very-High Fire Hazard Severity Zones
2. Land designated as Very-High Fire Hazard Severity Zone by cities and other local agencies.

3. Land designated as Wildland Interface Fire Area by cities and other local agencies.

#### Exceptions:

1. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.
2. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland Interface Fire Area designated by cities and other local agencies for which an application for a building permit is submitted on or after December 1, 2005 but prior to July 1, 2008, shall only comply with the following sections of this chapter:

2.1. Section 705A – Roofing

2.2. Section 706A – Attic Ventilation

**701A.4 Inspection and certification.** Building permit applications and final completion approvals for buildings within the scope and application of this chapter shall comply with the following:

1. **Building permit issuance.** The local building official shall, prior to construction, provide the owner or applicant a certification that the building as proposed to be built complies with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter. Issuance of a building permit by the local building official for the proposed building shall be considered as complying with this section.
2. **Building permit final.** The local building official shall, upon completion of construction, provide the owner or applicant with a copy of the final inspection report that demonstrates the building was constructed in compliance with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter. Issuance of a certificate of occupancy by the local building official for the proposed building shall be considered as complying with this section.

**701A.5 Vegetation management compliance.** Prior to building permit final approval, the property shall be in compliance with the vegetation management requirements prescribed in California Fire Code Section 4906, including California Public Resources Code 4291 or California Government Code Section 51182. Acceptable methods of compliance inspection

and documentation shall be determined by the enforcing agency and may include any of the following:

1. Local, state or federal fire authority or designee authorized to enforce vegetation management requirements
2. Enforcing agency
3. Third party inspection and certification authorized to enforce vegetation management requirements
4. Property owner certification authorized by the enforcing agency

## SECTION 702A DEFINITIONS

For the purposes of this chapter, certain terms are defined below:

**CDF DIRECTOR** means the Director of the California Department of Forestry and Fire Protection.

**EXTERIOR COVERING.** The exposed siding or cladding material applied to the exterior side of an exterior wall, roof eave soffit, floor projection or exposed underfloor framing.

**FIRE PROTECTION PLAN** is a document prepared for a specific project or development proposed for a Wildland Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure.

The Fire Protection Plan shall be in accordance with this chapter and the California Fire Code, Chapter 49. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted. Only locally adopted ordinances that have been filed with the California Building Standards Commission or the Department of Housing and Community Development in accordance with Section 1.1.8 shall apply.

**FIRE HAZARD SEVERITY ZONES** are geographical areas designated pursuant to California Public Resources Codes Sections 4201 through 4204 and classified as Very High, High, or Moderate in State Responsibility Areas or as Local Agency Very High Fire Hazard Severity Zones designated pursuant to California Government Code, Sections 51175 through 51189. See California Fire Code Article 86.

The California Code of Regulations, Title 14, Section 1280, entitles the maps of these geographical areas as "Maps of the Fire Hazard Severity Zones in the State Responsibility Area of California."

**HEAVY TIMBER.** A type of construction classification specified in Section 602. For use in this chapter, heavy timber shall be sawn lumber or glue laminated wood with the smallest minimum nominal dimension of 4 inches (102 mm). Heavy timber walls or floors shall be sawn or glue-laminated planks splined, tongue-and-grove, or set close together and well spiked.

**IGNITION-RESISTANT MATERIAL.** A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small

flames, as prescribed in Section 703A and SFM Standard 12-7A-5, Ignition-Resistant Material.

**LOCAL AGENCY VERY HIGH FIRE HAZARD SEVERITY ZONE** means an area designated by a local agency upon the recommendation of the CDF Director pursuant to Government Code Sections 51177(c), 51178 and 5118 that is not a state responsibility area and where a local agency, city, county, city and county, or district is responsible for fire protection.

**LOG WALL CONSTRUCTION.** A type of construction in which exterior walls are constructed of solid wood members and where the smallest horizontal dimension of each solid wood member is at least 6 inches (152 mm).

**RAFTER TAIL.** The portion of roof rafter framing in a sloping roof assembly that projects beyond and overhangs an exterior wall.

**ROOF EAVE.** The lower portion of a sloping roof assembly that projects beyond and overhangs an exterior wall at the lower end of the rafter tails. Roof eaves may be either "open" or "enclosed." Open roof eaves have exposed rafter tails and an unenclosed space on the underside of the roof deck. Enclosed roof eaves have a boxed-in roof eave soffit with a horizontal underside or sloping rafter tails with an exterior covering applied to the underside of the rafter tails.

**ROOF EAVE SOFFIT.** An enclosed boxed-in soffit under a roof eave with exterior covering material applied to the soffit framing creating a horizontal surface on the exposed underside.

**STATE RESPONSIBILITY AREA** means lands that are classified by the Board of Forestry pursuant to Public Resources Code Section 4125 where the financial responsibility of preventing and suppressing forest fires is primarily the responsibility of the state.

**WILDFIRE** is any uncontrolled fire spreading through vegetative fuels that threatens to destroy life, property, or resources as defined in Public Resources Code Sections 4103 and 4104.

**WILDFIRE EXPOSURE** is one or a combination of radiant heat, convective heat, direct flame contact and burning embers being projected by vegetation fire to a structure and its immediate environment.

**WILDLAND-URBAN INTERFACE FIRE AREA** is a geographical area identified by the state as a "Fire Hazard Severity Zone" in accordance with the Public Resources Code Sections 4201 through 4204 and Government Code Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires.

## SECTION 703A STANDARDS OF QUALITY

**703A.1 General.** Building material, systems, assemblies and methods of construction used in this chapter shall be in accordance with Section 703A.

**703A.2 Qualification by testing.** Material and material assemblies tested in accordance with the requirements of

Section 703A shall be accepted for use when the results and conditions of those tests are met. Product evaluation testing of material and material assemblies shall be approved or listed by the State Fire Marshal, or identified in a current report issued by an approved agency.

**703A.3 Approved agency.** Product evaluation testing shall be performed by an approved agency as defined in Section 1702. The scope of accreditation for the approved agency shall include building product compliance with this code.

**703A.4 Labeling.** Material and material assemblies tested in accordance with the requirements of Section 703A shall bear an identification label showing the fire test results. That identification label shall be issued by a testing and/or inspecting agency approved by the State Fire Marshal.

1. Identification mark of the approved testing and/or inspecting agency
2. Contact and identification information of the manufacturer
3. Model number or identification of the product or material
4. Pre-test weathering specified in this chapter
5. Compliance standard as described under Section 703A.7

#### **703A.5 Weathering and surface treatment protection.**

**703A.5.1 General.** Material and material assemblies tested in accordance with the requirements of Section 703A shall maintain their fire test performance under conditions of use, when installed in accordance with the manufacturers instructions.

**703A.5.2 Weathering.** Fire-retardant-treated wood and fire-retardant-treated wood shingles and shakes shall meet the fire test performance requirements of this chapter after being subjected to the weathering conditions contained in the following standards, as applicable to the materials and the conditions of use.

**703A.5.2.1 Fire-retardant-treated wood.** Fire-retardant-treated wood shall be tested in accordance with ASTM D 2898, "Standard Practice for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing (Method A)" and the requirements of Section 2303.2.

**703A.5.2.2 Fire-retardant-treated wood shingles and shakes.** Fire-retardant-treated wood shingles and shakes shall be approved and listed by the State Fire Marshal in accordance with Section 208(c), Title 19 California Code of Regulations.

**703A.5.3 Surface treatment protection.** The use of paints, coatings, stains or other surface treatments are not an approved method of protection as required in this chapter.

**703A.6 Alternates for materials, design, tests and methods of construction.** The enforcing agency is permitted to modify the provisions of this chapter for site-specific conditions in accordance with Section 1.11.2.4. When required by the enforcing agency for the purposes of granting modifications,

a fire protection plan shall be submitted in accordance with the California Fire Code, Chapter 49.

**703A.7 Standards of quality.** The State Fire Marshal standards for exterior wildfire exposure protection listed below and as referenced in this chapter are located in the California Referenced Standards Code, Part 12 and Chapter 35 of this code.

**SFM Standard 12-7A-1, Exterior Wall Siding and Sheathing.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 10-minute duration.

**SFM Standard 12-7A-2, Exterior Windows.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 8-minute duration.

**SFM Standard 12-7A-3, Horizontal Projection Underside**  
A fire resistance test standard consisting of a 300 kW intensity direct flame exposure for a 10-minute duration.

**SFM Standard 12-7A-4, Decking.** A two-part test consisting of a heat release rate (Part A) deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration, and a (Part B) sustained deck assembly combustion test consisting of a deck upper surface burning ember exposure with a 12 mph wind for 40 minutes using a 2.2lb (1kg) burning "Class A" size 12" x 12" x 2.25" (300 mm x 300 mm x 57 mm) roof test brand.

**SFM Standard 12-7A-4A, Decking Alternate Method A.** A heat release rate deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration,

**SFM Standard 12-7A-5, Ignition-resistant Material.** A generic building material surface burning flame spread test standard consisting of an extended 30 minute ASTM E84 or UL 723 test method as is used for fire-retardant-treated wood.

## **SECTION 704A IGNITION-RESISTANT CONSTRUCTION**

**704A.1 General.** The materials prescribed herein for ignition resistance shall conform to the requirements of this chapter.

**704A.2 Ignition-resistant material.** Ignition-resistant material shall be determined in accordance with the test procedures set forth in SFM Standard 12-7A-5 "Ignition-Resistant Material" or in accordance with this section.

**704A.3 Alternative methods for determining ignition-resistant material.** Any one of the following shall be accepted as meeting the definition of ignition-resistant material:

1. Noncombustible material. Material that complies with the definition for noncombustible materials in Section 202.
2. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use that complies with the requirements of Section 2303.2.
3. Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes, as defined in Section 1505.6 and listed by State Fire Marshal for

use as "Class B" roof covering, shall be accepted as an ignition-resistant wall covering material when installed over solid sheathing.

## SECTION 705A ROOFING

**705A.1 General.** Roofs shall comply with the requirements of Chapter 7A and Chapter 15. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.

**705A.2 Roof coverings.** Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be firestopped with approved materials or have one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D 3909 installed over the combustible decking.

**705A.3 Roof valleys.** Where valley flashing is installed, the flashing shall be not less than 0.019-inch (0.48 mm) No. 26 gage galvanized sheet corrosion-resistant metal installed over not less than one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D 3909, at least 36-inch-wide (914 mm) running the full length of the valley.

**705A.4 Roof gutters.** Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris in the gutter.

## SECTION 706A VENTS

**706A.1 General.** Where provided, ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation shall be in accordance with Section 1203 and Sections 706A.1 through 706A.3 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

**706A.2 Requirements.** Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet the following requirements:

1. The dimensions of the openings therein shall be a minimum of  $\frac{1}{16}$ -inch (1.6 mm) and shall not exceed  $\frac{1}{8}$ -inch (3.2mm).

2. The materials used shall be noncombustible.

**Exception:** Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible wire mesh, may be of combustible materials.

3. The materials used shall be corrosion resistant.

**706A.3 Ventilation openings on the underside of eaves and cornices.** Vents shall not be installed on the underside of eaves and cornices.

### Exceptions:

1. The enforcing agency may accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.
2. Vents complying with the requirements of Section 706A.2 may be installed on the underside of eaves and cornices in accordance with either one of the following conditions:
  - 2.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,
  - 2.2. The exterior wall covering and exposed underside of the eave are of noncombustible material, or ignition-resistant-materials as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material and the vent is located more than 12 feet from the ground or walking surface of a deck, porch, patio or similar surface.

## SECTION 707A EXTERIOR COVERING

**707A.1 Scope.** The provisions of this section shall govern the materials and construction methods used to resist building ignition and/or safeguard against the intrusion of flames resulting from small ember and short-term direct flame contact exposure.

**707A.2 General.** The following exterior covering materials and/or assemblies shall comply with this section:

1. Exterior wall covering material
2. Exterior wall assembly
3. Exterior exposed underside of roof eave overhangs
4. Exterior exposed underside of roof eave soffits
5. Exposed underside of exterior porch ceilings
6. Exterior exposed underside of floor projections
7. Exterior underfloor areas

### Exceptions:

1. Exterior wall architectural trim, embellishments, fascias, and gutters
2. Roof or wall top cornice projections and similar assemblies
3. Roof assembly projections over gable end walls
4. Solid wood rafter tails and solid wood blocking installed between rafters having minimum dimension 2 inch (50.8 mm) nominal
5. Deck walking surfaces shall comply with Section 709A.4 only

**707A.3 Exterior walls.** The exterior wall covering or wall assembly shall comply with one of the following requirements:

1. Noncombustible material
2. Ignition-resistant material
3. Heavy timber exterior wall assembly
4. Log wall construction assembly
5. Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1

**Exception:** Any of the following shall be deemed to meet the assembly performance criteria and intent of this section:

1. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind the exterior covering or cladding on the exterior side of the framing
2. The exterior portion of a 1-hour fire resistive exterior wall assembly designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

**707A.3.1 Extent of exterior wall covering.** Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2 inch (50.8 mm) nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

**707A.4 Open roof eaves.** The exposed roof deck on the underside of unenclosed roof eaves shall consist of one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside exterior of the roof deck
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the roof deck designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

**Exceptions:** The following materials do not require protection:

1. Solid wood rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm)
2. Solid wood blocking installed between rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm)
3. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails
4. Fascia and other architectural trim boards

**707A.5 Enclosed roof eaves and roof eave soffits.** The exposed underside of enclosed roof eaves having either a boxed-in roof eave soffit with a horizontal underside, or sloping rafter tails with an exterior covering applied to the underside of the rafter tails, shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

**Exceptions:** The following materials do not require protection:

1. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails
2. Fascia and other architectural trim boards

**707A.6 Exterior porch ceilings.** The exposed underside of exterior porch ceilings shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the ceiling assembly including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

**Exception:** Architectural trim boards.

**707A.7 Floor projections.** The exposed underside of a cantilevered floor projection where a floor assembly extends over an exterior wall shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor pro-

*jection including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual*

5. The underside of a floor projection assembly that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

**Exception:** Architectural trim boards.

**707A.8 Underfloor protection.** The underfloor area of elevated or overhanging buildings shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

**Exception:** Heavy timber structural columns and beams do not require protection.

**707A.8 Underside of appendages.** When required by the enforcing agency the underside of overhanging appendages shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

**Exception:** Heavy timber structural columns and beams do not require protection.

## SECTION 708A EXTERIOR WINDOWS AND DOORS

### 708A.1 General.

**708A.2 Exterior glazing.** The following exterior glazing materials and/or assemblies shall comply with this section:

1. Exterior windows
2. Exterior glazed doors
3. Glazed openings within exterior doors
4. Glazed openings within exterior garage doors
5. Exterior structural glass veneer

**708A.2.1 Exterior windows and exterior glazed door assembly requirements.** Exterior windows and exterior glazed door assemblies shall comply with one of the following requirements:

1. Be constructed of multipane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing, or
2. Be constructed of glass block units, or
3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
4. Be tested to meet the performance requirements of SFM Standard 12-7A-2

**708A.2.2 Structural glass veneer.** The wall assembly behind structural glass veneer shall comply with Section 707A.3.

**708A.3 Exterior doors.** Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible or ignition-resistant material, or
2. Shall be constructed of solid core wood that comply with the following requirements:
  - 2.1. Stiles and rails shall not be less than  $1\frac{3}{8}$  inches thick.
  - 2.2. Raised panels shall not be less than  $1\frac{1}{4}$  inches thick, except for the exterior perimeter of the raised panel that may taper to a tongue not less than  $\frac{3}{8}$  inch thick.
3. Shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
4. Shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

**708A.3.1 Exterior door glazing.** Glazing in exterior doors shall comply with Section 708A.2.1.

## SECTION 709A DECKING

**709A.1 General.** The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of this section.

**709A.2 Where required.** The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of this section when any portion of such surface is within 10 feet (3048 mm) of the building.

**709A.3 Decking Surfaces.** The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. Ignition-resistant material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.
2. Exterior fire retardant treated wood
3. Noncombustible material
4. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

**Exception:** Wall material may be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E 84 with a Class B flame spread rating.

## SECTION 710A ACCESSORY STRUCTURES

**710A.1 General.** Accessory and miscellaneous structures, other than buildings covered by Section 701A.3, which pose a significant exterior exposure hazard to applicable buildings during wildfires shall be constructed to conform to the ignition resistance requirements of this section.

**710A.2 Applicability.** The provisions of this section shall apply to trellises, arbors, patio covers, carports, gazebos and similar structures of an accessory or miscellaneous character.

### Exceptions:

1. Decks shall comply with the requirements of Section 709A.
2. Awnings and canopies shall comply with the requirements of Section 3105.

**710A.3 Where required.** Accessory structures shall comply with the requirements of this section.

**710A.3.1** Attached accessory structures shall comply with the requirements of this section.

**710A.3.2** When required by the enforcing agency, detached accessory structures within 50 feet of an applicable building shall comply with the requirements of this section.

**710A.4 Requirements.** When required by the enforcing agency accessory structures shall be constructed of noncombustible or ignition-resistant materials.



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 8 – INTERIOR FINISHES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
 See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X		X	X			X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)		X																		
Adopt only those sections that are listed below																				
<i>Chapter / Section</i>																				
Table 803.9		X																		
804.4		X																		
804.4.1		X																		
804.4.2		X																		
<i>804.4.3</i>		X																		
806.1		X																		
806.5		X																		



## CHAPTER 8

# INTERIOR FINISHES

### SECTION 801 GENERAL

**801.1 Scope.** Provisions of this chapter shall govern the use of materials used as interior finishes, trim and decorative materials.

**801.2 Interior wall and ceiling finish.** The provisions of Section 803 shall limit the allowable fire performance and smoke development of interior wall and ceiling finish materials based on occupancy classification.

**801.3 Interior floor finish.** The provisions of Section 804 shall limit the allowable fire performance of interior floor finish materials based on occupancy classification.

**[F] 801.4 Decorative materials and trim.** Decorative materials and trim shall be restricted by combustibility and the flame propagation performance criteria of NFPA 701, in accordance with Section 806.

**801.5 Applicability.** For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials below the elevation required by Section 1612 shall be flood-damage-resistant materials.

**801.6 Application.** Combustible materials shall be permitted to be used as finish for walls, ceilings, floors and other interior surfaces of buildings.

**801.7 Windows.** Show windows in the exterior walls of the first story above grade plane shall be permitted to be of wood or of unprotected metal framing.

**801.8 Foam plastics.** Foam plastics shall not be used as interior finish except as provided in Section 803.4. Foam plastics shall not be used as interior trim except as provided in Section 806.3 or 2604.2. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

### SECTION 802 DEFINITIONS

**802.1 Definitions.** The following terms are defined in Chapter 2:

**EXPANDED VINYL WALL COVERING.**

**FLAME SPREAD.**

**FLAME SPREAD INDEX.**

**INTERIOR FINISH.**

**INTERIOR FLOOR FINISH.**

**INTERIOR FLOOR-WALL BASE.**

**INTERIOR WALL AND CEILING FINISH.**

**SITE-FABRICATED STRETCH SYSTEM.**

**SMOKE-DEVELOPED INDEX.**

**TRIM.**

### SECTION 803 WALL AND CEILING FINISHES

**803.1 General.** Interior wall and ceiling finish materials shall be classified for fire performance and smoke development in accordance with Section 803.1.1 or 803.1.2, except as shown in Sections 803.2 through 803.13. Materials tested in accordance with Section 803.1.2 shall not be required to be tested in accordance with Section 803.1.1.

**803.1.1 Interior wall and ceiling finish materials.** Interior wall and ceiling finish materials shall be classified in accordance with ASTM E 84 or UL 723. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

Class A: = Flame spread index 0-25; smoke-developed index 0-450.

Class B: = Flame spread index 26-75; smoke-developed index 0-450.

Class C: = Flame spread index 76-200; smoke-developed index 0-450.

**Exception:** Materials tested in accordance with Section 803.1.2.

**803.1.2 Room corner test for interior wall or ceiling finish materials.** Interior wall or ceiling finish materials shall be permitted to be tested in accordance with NFPA 286. Interior wall or ceiling finish materials tested in accordance with NFPA 286 shall comply with Section 803.1.2.1.

**803.1.2.1 Acceptance criteria for NFPA 286.** The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
3. Flashover, as defined in NFPA 286, shall not occur.
4. The peak heat release rate throughout the test shall not exceed 800 kW.
5. The total smoke released throughout the test shall not exceed 1,000 m<sup>2</sup>.

**803.1.3 Room corner test for textile wall coverings and expanded vinyl wall coverings.** Textile wall coverings and expanded vinyl wall coverings shall meet the criteria of Section 803.1.3.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product-mounting system, including adhesive.

**803.1.3.1 Acceptance criteria for NFPA 265.** The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 by 305 mm) walls.
3. Flashover, as defined in NFPA 265, shall not occur.
4. The total smoke released throughout the test shall not exceed 1,000 m<sup>2</sup>.

**803.1.4 Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84 or UL 723.** Textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

**803.2 Thickness exemption.** Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.

**803.3 Heavy timber exemption.** Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to interior finish requirements.

**803.4 Foam plastics.** Foam plastics shall not be used as interior finish except as provided in Section 2603.10. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

**803.5 Textile wall coverings.** Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2, 803.1.3 or 803.1.4.

**803.6 Textile ceiling coverings.** Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2 or 803.1.4.

**803.7 Expanded vinyl wall coverings.** Where used as interior wall finish materials, expanded vinyl wall coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2, 803.1.3 or 803.1.4.

**803.8 Expanded vinyl ceiling coverings.** Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2 or 803.1.4.

**803.9 Interior finish requirements based on group.** Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.9 for the group and location designated. Interior wall and ceiling finish materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 or UL 723 is required.

**803.10 Stability.** Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

**803.11 Application of interior finish materials to fire-resistance-rated or noncombustible building elements.** Where interior finish materials are applied on walls, ceilings or structural elements required to have a fire-resistance rating or to be of noncombustible construction, they shall comply with the provisions of this section.

**803.11.1 Direct attachment and furred construction.**

Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the interior finish material shall be applied directly against such construction or to furring strips not exceeding 1<sup>3</sup>/<sub>4</sub> inches (44 mm), applied directly against such surfaces.

**803.11.1.1 Furred construction.** If the interior finish material is applied to furring strips, the intervening spaces between such furring strips shall comply with one of the following:

1. Be filled with material that is inorganic or non-combustible;
2. Be filled with material that meets the requirements of a Class A material in accordance with Section 803.1.1 or 803.1.2; or
3. Be fireblocked at a maximum of 8 feet (2438 mm) in every direction in accordance with Section 718.

**803.11.2 Set-out construction.** Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.11.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used.

**Exceptions:**

1. Where interior finish materials are protected on both sides by an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Where interior finish materials are attached to noncombustible backing or furring strips installed as specified in Section 803.11.1.1.

**803.11.2.1 Hangers and assembly members.** The hangers and assembly members of such dropped ceilings that are below the horizontal fire-resistance rated floor or roof assemblies shall be of noncombustible materials. The construction of each set-out wall and

**TABLE 803.9  
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY<sup>k</sup>**

GROUP	SPRINKLERED <sup>i</sup>			NONSPRINKLERED		
	Interior exit stairways, interior exit ramps and exit passageways <sup>a,b</sup>	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces <sup>c</sup>	Interior exit stairways, interior exit ramps and exit passageways <sup>a,b</sup>	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces <sup>c</sup>
A-1 & A-2	B	B	C	A	A <sup>d</sup>	B <sup>e</sup>
A-3 <sup>f</sup> , A-4, A-5	B	B	C	A	A <sup>d</sup>	C
B, E, M, R-1	B	C	C	A	B	C
R-4	B	C	C	A	B	B
F	C	C	C	B	C	C
H, L	B	B	C <sup>g</sup>	A	A	B
I-2, I-2.1	B	B	B <sup>h,i</sup>	A	A	B
I-3	A	A <sup>j</sup>	B	NP	NP	NP
I-4	B	B	B <sup>h,i</sup>	A	A	B
R-2	C	C	C	B	B	C
R-2.1	B	C	C	A	B	B
R-3, R-3.1	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929m<sup>2</sup>.

NP = Not permitted [SFM]

- a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.11.1.
- b. In other than Group I-2 and I-2.1 occupancies in buildings less than three stories above grade plane of other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.
- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.
- e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.
- f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.
- g. Class B material is required where the building exceeds two stories.
- h. Class C interior finish materials shall be permitted in administrative spaces.
- i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.
- j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.
- k. Finish materials as provided for in other sections of this code.
- l. Applies when protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

horizontal fire-resistance rated floor or roof assembly shall be of fire-resistance-rated construction as required elsewhere in this code.

**Exception:** In Types III and V construction, fire-retardant-treated wood shall be permitted for use as hangers and assembly members of dropped ceilings.

**803.11.3 Heavy timber construction.** Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fire-blocked as specified in Section 803.11.1.1.

**803.11.4 Materials.** An interior wall or ceiling finish material that is not more than  $\frac{1}{4}$  inch (6.4 mm) thick shall be applied directly onto the wall, ceiling or structural ele-

ment without the use of furring strips and shall not be suspended away from the building element to which it is applied.

**Exceptions:**

1. Noncombustible interior finish materials.
2. Materials that meet the requirements of Class A materials in accordance with Section 803.1.1 or 803.1.2 where the qualifying tests were made with the material furred out from the noncombustible backing shall be permitted to be used with furring strips.
3. Materials that meet the requirements of Class A materials in accordance with Section 803.1.1 or 803.1.2 where the qualifying tests were made with the material suspended away from the non-

combustible backing shall be permitted to be used suspended away from the building element.

**803.12 High-density Polyethylene (HDPE) and Polypropylene (PP).** Where high-density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.2.

**803.13 Site-fabricated stretch systems.** Where used as interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Section 802 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or 803.1.2. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.

## SECTION 804 INTERIOR FLOOR FINISH

**804.1 General.** Interior floor finish and floor covering materials shall comply with Sections 804.2 through 804.4.2.

**Exception:** Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not comprised of fibers.

**804.2 Classification.** Interior floor finish and floor covering materials required by Section 804.4.2 to be of Class I or II materials shall be classified in accordance with NFPA 253. The classification referred to herein corresponds to the classifications determined by NFPA 253 as follows: Class I, 0.45 watts/cm<sup>2</sup> or greater; Class II, 0.22 watts/cm<sup>2</sup> or greater.

**804.3 Testing and identification.** Interior floor finish and floor covering materials shall be tested by an agency in accordance with NFPA 253 and identified by a hang tag or other suitable method so as to identify the manufacturer or supplier and style, and shall indicate the interior floor finish or floor covering classification according to Section 804.2. Carpet-type floor coverings shall be tested as proposed for use, including underlayment. Test reports confirming the information provided in the manufacturer's product identification shall be furnished to the building official upon request.

**804.4 Interior floor finish requirements.** Interior floor covering materials shall comply with Sections 804.4.1 and 804.4.2 and interior floor finish materials shall comply with Section 804.4.3.

**804.4.1 Test requirement.** In all other occupancies except I-3, interior floor finish and interior floor covering materials shall comply with the requirements of the *ASTM Standard E 648, and having a specific optical density smoke rating not to exceed 450 per ASTM E 662. For Group I-3 occupancies see Section 804.4.3.*

**804.4.2 Minimum critical radiant flux.** In all occupancies, interior floor finish and floor covering materials in enclosures for stairways and ramps, exit passageways, corridors and rooms or spaces not separated from corridors by partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux. The minimum critical radiant flux shall not be less than

Class I in Groups I-2 and not less than Class II in Groups A, B, E, H, I-2,I, I- 4, M, R-1, R-2 and S.

**Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with *ASTM Standard E 648, and having a specific optical density smoke rating not to exceed 450 per ASTM E 662 are permitted in any area where Class II materials are required.*

**804.4.3 Group I-3 Occupancy floor surfaces.** Interior floor finish and floor coverings occupied by inmates or patients whose personal liberties are restrained shall be noncombustible.

**Exception:** Noncombustible floor finish and floor coverings in areas where restraint is not used may have carpet or other floor covering materials applied in areas protected by an automatic sprinkler system and meeting *ASTM Standard E 648, and having a specific optical density smoke rating not to exceed 450 per ASTM E 662. The carpeting and carpet padding shall be tested as a unit in accordance with floor covering radiant panel test meeting class 1 and has a critical radiant flux limit of not less than 0.45 watt per centimeter square. The carpeting and padding shall be identified by a hang-tag or other suitable method as to manufacturer and style and shall indicate the classification of the material based on the limits set forth above.*

## SECTION 805 COMBUSTIBLE MATERIALS IN TYPES I AND II CONSTRUCTION

**805.1 Application.** Combustible materials installed on or embedded in floors of buildings of Type I or II construction shall comply with Sections 805.1.1 through 805.1.3.

**Exception:** Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.

**805.1.1 Subfloor construction.** Floor sleepers, bucks and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance-rated floor assembly and the flooring is either solidly filled with noncombustible materials or fireblocked in accordance with Section 718, and provided that such open spaces shall not extend under or through permanent partitions or walls.

**805.1.2 Wood finish flooring.** Wood finish flooring is permitted to be attached directly to the embedded or fire-blocked wood sleepers and shall be permitted where cemented directly to the top surface of fire-resistance-rated floor assemblies or directly to a wood subfloor attached to sleepers as provided for in Section 805.1.1.

**805.1.3 Insulating boards.** Combustible insulating boards not more than  $\frac{1}{2}$  inch (12.7 mm) thick and covered with finish flooring are permitted where attached directly to a noncombustible floor assembly or to wood subflooring attached to sleepers as provided for in Section 805.1.1.

## SECTION 806 DECORATIVE MATERIALS AND TRIM

**[F] 806.1 General requirements.** In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other decorative materials suspended from walls or ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

### Exceptions:

1. Curtains, draperies, hangings and other decorative materials suspended from walls of sleeping units and dwelling units in dormitories in Group R-2 protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1 and such materials are limited to not more than 50 percent of the aggregate area of walls.
2. Decorative materials, including, but not limited to, photographs and paintings in dormitories in Group R-2 where such materials are of limited quantities such that a hazard of fire development or spread is not present.

In Groups I-1, I-2 and I-2.1, combustible decorative materials shall meet the flame propagation criteria of NFPA 701 unless the decorative materials, including, but not limited to, photographs and paintings, are of such limited quantities that a hazard of fire development or spread is not present. In Group I-3, combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered interior finish if they cover 10 percent or more of the wall or of the ceiling area, and shall not be considered decorative materials or furnishings.

In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall meet the flame propagation performance criteria in accordance with Section 806.2 and NFPA 701 or shall be noncombustible.

**[F] 806.1.1 Noncombustible materials.** The permissible amount of noncombustible decorative material shall not be limited.

**[F] 806.1.2 Combustible decorative materials.** The permissible amount of decorative materials meeting the flame propagation performance criteria of NFPA 701 shall not exceed 10 percent of the specific wall or ceiling area to which it is attached.

### Exceptions:

1. In auditoriums in Group A, the permissible amount of decorative material meeting the flame propagation performance criteria of NFPA 701 shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an automatic sprinkler system in accordance

with Section 903.3.1.1 and where the material is installed in accordance with Section 803.11.

2. The amount of fabric partitions suspended from the ceiling and not supported by the floor in Group B and M occupancies shall not be limited.

**[F] 806.2 Acceptance criteria and reports.** Where required by Section 806.1, decorative materials shall be tested by an agency and meet the flame propagation performance criteria of NFPA 701 or such materials shall be noncombustible. Reports of test results shall be prepared in accordance with NFPA 701 and furnished to the building official upon request.

**[F] 806.3 Foam plastic.** Foam plastic used as trim in any occupancy shall comply with Section 2604.2.

**[F] 806.4 Pyroxylin plastic.** Imitation leather or other material consisting of or coated with a pyroxylin or similarly hazardous base shall not be used in Group A occupancies.

**[F] 806.5 Interior trim.** Material, other than foam plastic used as interior trim, shall have a minimum *Class B flame spread and 450 smoke-developed index in Group I-3 and for all other occupancies* Class C flame spread and smoke-developed index when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling area in which it is attached.

**[F] 806.6 Interior floor-wall base.** Interior floor-wall base that is 6 inches (152 mm) or less in height shall be tested in accordance with Section 804.2 and shall not be less than Class II. Where a Class I floor finish is required, the floor-wall base shall be Class I.

**Exception:** Interior trim materials that comply with Section 806.5.

## SECTION 807 INSULATION

**807.1 Insulation.** Thermal and acoustical insulation shall comply with Section 720.

## SECTION 808 ACOUSTICAL CEILING SYSTEMS

**808.1 Acoustical ceiling systems.** The quality, design, fabrication and erection of metal suspension systems for acoustical tile and lay-in panel ceilings in buildings or structures shall conform with generally accepted engineering practice, the provisions of this chapter and other applicable requirements of this code.

**808.1.1 Materials and installation.** Acoustical materials complying with the interior finish requirements of Section 803 shall be installed in accordance with the manufacturer's recommendations and applicable provisions for applying interior finish.

**808.1.1.1 Suspended acoustical ceilings.** Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C 635 and ASTM C 636.

**808.1.1.2 Fire-resistance-rated construction.** Acoustical ceiling systems that are part of fire-resistance-rated construction shall be installed in the same manner used in the assembly tested and shall comply with the provisions of Chapter 7.

## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 9 – FIRE PROTECTION SYSTEMS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X													X	
Chapter / Section																				
901.2			X																	
901.3			X																	
901.5			X																	
901.6.2			X																	
902.1			X																	
Fire Appliance			X																	
Sprinkler Alarm			X																X	
Sprinkler System			X																X	
Standpipe System, Classes of.			X																X	
903.2.1.2			X																	
903.2.1.3			X																	
903.2.3			X																	
903.2.4.1			X																	
903.2.5.4			X																	
903.2.6			X																	
903.2.6.1			X																	
903.2.6.2			X																	
903.2.6.3			X																	
903.2.7			X																	
903.2.7.1			X																	
903.2.8			X																	
903.2.10			X																	
Table 903.2.11.6			X																	
903.2.14			X																	
903.2.14.1			X																	
903.2.14.2			X																	
903.2.15			X																	
903.2.15.1			X																	
903.2.16			X																	
903.2.16.1			X																	
903.2.17			X																	
903.2.17.1			X																	
903.2.17.2			X																	
903.2.17.2.1			X																	
903.2.17.2.2			X																	
903.2.17.2.3			X																	
903.2.17.2.4			X																	
903.2.17.2.5			X																	
903.2.17.2.6			X																	
903.2.18			X																	
903.2.19			X																	

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
> Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X												X		
Chapter / Section																				
903.1.3			X																	
903.2			X																	
903.2.7			X																	
903.2.7.1			X																	
903.2.8			X																	
903.2.8.1			X																	
903.2.10			X																	
903.2.11.4			X																	
Table 903.2.11.6			X																	
903.2.12			X																	
903.2.14			X																	
903.2.14.1			X																	
903.2.14.2			X																	
903.2.15			X																	
903.2.15.1			X																	
903.2.16			X																	
903.2.16.1			X																	
903.2.17			X																	
903.2.18			X																	
903.2.19			X																	
903.2.19.1			X																	
903.2.19.1.1			X																	
903.2.19.1.2			X																	
903.3.1.1			X																	
903.3.1.1.1			X																	
903.3.1.2			X																	
903.3.2			X																	
903.3.5			X																	
903.3.5.2			X																	
903.3.7			X																	
903.3.8			X																	
903.4.2			X																	
903.4.3			X																	
903.5			X																	
904.2.1			X																	
904.3.1			X																	
904.5			X																	
904.6			X																	
904.7			X																	
904.8			X																	
904.9			X																	
904.10			X																	

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)		X	X	X																
Adopt only those sections that are listed below						X													X	
<i>Chapter / Section</i>																				
904.11			X																	
905.1			X																	
905.3			X																	
905.3.1			X																	
905.3.6			X																	
905.3.8			X																	
905.3.9			X																	
905.3.10			X																	
905.3.11			X																	
905.3.11.1			X																	
905.4			X																	
905.5			X																	
906.1			X																	
906.2			X																	
Table 906.3(1)			X																	
906.3.2			X																	
Table 906.3(2)			X																	
906.3.4			X																	
907.1.2			X																	
907.1.3			X																	
907.1.4			X																	
907.1.5			X																	
907.2			X																	
907.2.1			X																	
907.2.1.1			X																	
907.2.1.3			X																	
907.2.2			X																	
907.2.2.2			X																	
907.2.3			X																	
907.2.3.1			X																	
907.2.3.2			X																	
907.2.3.3			X																	
907.2.3.4			X																	
907.2.3.5			X																	
907.2.3.6			X																	
907.2.3.6.1			X																	
907.2.3.6.2			X																	
907.2.3.7			X																	
907.2.3.8			X																	

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X													X	
Chapter / Section																				
907.2.3.8.1			X																	
907.2.3.8.2			X																	
907.2.5			X																	
907.2.5.1			X																	
907.2.6			X																	
907.2.6.2			X																	
907.2.6.2.1			X																	
907.2.6.2.2			X																	
907.2.6.3			X																	
907.2.6.3.3			X																	
907.2.6.3.4			X																	
907.2.6.4			X																	
907.2.8			X																	
907.2.9			X																	
907.2.9.1			X																	
907.2.9.3			X																	
907.2.9.4			X																	
907.2.9.4.1			X																	
907.2.11			X																	
907.2.11.1			X																	
907.2.11.2			X																	
907.2.11.2.1			X																	
907.2.11.2.2			X																	
907.2.11.2.3			X																	
907.2.11.3			X																	
907.2.11.4			X																	
907.2.11.5			X																	
907.2.11.6			X																	
907.2.13			X																	
907.2.13.1			X																	
907.2.13.1.1			X																	
907.2.13.1.2			X																	
907.2.13.2			X																	
907.2.15			X																	
907.2.16			X																	
907.2.24			X																	
907.2.24.1			X																	
907.2.24.2			X																	
907.2.24.3			X																	
907.2.24.4			X																	

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter	X						X	X	X	X	X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X														
Adopt only those sections that are listed below							X											X	
Chapter / Section																			
907.2.24.4.1				X															
907.2.24.4.2				X															
907.2.24.4.3				X															
907.2.25				X															
907.2.25.1				X															
907.2.25.2				X															
907.2.26				X															
907.2.26.1				X															
907.2.26.2				X															
907.2.26.3				X															
907.2.26.4				X															
907.2.26.4.1				X															
907.2.26.4.2				X															
907.2.27				X															
907.2.28				X															
907.2.28.1				X															
907.2.29				X															
907.2.29.1				X															
907.2.29.2				X															
907.2.29.3				X															
907.2.29.4				X															
907.3				X															
907.3.1				X															
907.3.2				X															
907.3.2.1				X															
907.3.2.2				X															
907.3.2.3				X															
907.4.1				X															
907.4.2.1				X															
907.4.2.2							X												
907.4.2.5					X														
907.4.2.7					X														
907.5.2.1					X														
907.5.2.1.1					X														
907.5.2.1.3					X														
907.5.2.2					X														
907.5.2.3					X			X											
907.5.2.3.1					X			X											
907.5.2.3.2								X											
907.5.2.3.3					X			X											
Table 907.5.2.3.3					X			X											

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4							
Adopt entire chapter	X								X	X	X	X							
Adopt entire chapter as amended (amended sections listed below)			X	X	X														
Adopt only those sections that are listed below							X										X		
Chapter / Section																			
907.5.2.3.4			X	X	X	X	X												
907.5.2.3.5			X					X											
907.5.2.4			X																
907.5.2.5			X																
907.6.1			X																
907.6.1.1			X																
907.6.3			X																
907.6.3.1.1			X																
907.6.3.2			X																
907.6.3.3			X																
907.6.3.4			X																
907.6.5			X																
907.6.5.2			X																
907.6.5.3			X																
907.7			X																
907.8			X																
908.6			X																
908.7				t	t														
909.1			X																
909.5.2			X																
909.8			X																
909.10.2			X																
909.12			X																
909.12.1			X																
909.13.1				X	X														
909.16			X																
909.16.3			X																
909.18.9			X																
909.20.1			X																
909.20.2.1			X																
909.20.2.2			X																
909.20.2.3			X																
909.20.2.4			X																
909.20.2.5			X																

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**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 9 – FIRE PROTECTION SYSTEMS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)			X	X	X															
Adopt only those sections that are listed below						X													X	
<i>Chapter / Section</i>																				
909.20.3			X																	
909.20.3.1			X																	
909.20.3.2			X																	
909.20.4			X																	
909.20.4.1			X																	
909.20.4.2			X																	
909.20.4.3			X																	
909.20.4.3.1			X																	
909.20.4.3.2			X																	
909.20.4.3.3			X																	
909.20.5			X																	
909.20.5.1			X																	
909.20.5.2			X																	
909.20.5.3			X																	
910.1			X																	
910.2			X																	
910.2.1			X																	
910.2.2			X																	
910.3			X																	
910.3.1			X																	
910.3.2			X																	
910.3.3			X																	
910.4			X																	
910.4.1			X																	
910.4.2			X																	
910.4.3			X																	
910.4.3.1			X																	
910.4.4			X																	
910.4.5			X																	
910.4.6			X																	
910.4.7			X																	
911.1			X																	
911.1.5			X																	
912.3			X																	
912.5			X																	
913.6			X																	

*The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 1.11.*



## CHAPTER 9

# FIRE PROTECTION SYSTEMS

### SECTION 901 GENERAL

**901.1 Scope.** The provisions of this chapter shall specify where fire protection systems are required and shall apply to the design, installation and operation of fire protection systems.

**901.2 Fire protection systems.** Fire protection systems shall be installed, repaired, operated and maintained in accordance with this code and the *California Fire Code*.

Any fire protection system for which an exception or reduction to the provisions of this code has been granted shall be considered to be a required system.

**Exception:** Any fire protection system or portion thereof not required by this code shall be permitted to be installed for partial or complete protection provided that such system meets the requirements of this code.

**901.3 Modifications.** No person shall remove or modify any fire protection system installed or maintained under the provisions of this code or the *California Fire Code* without approval by the building official.

**901.4 Threads.** Threads provided for fire department connections to sprinkler systems, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

**901.5 Acceptance tests.** Fire protection systems shall be tested in accordance with the requirements of this code and the *California Fire Code*. When required, the tests shall be conducted in the presence of the building official. Tests required by this code, the *California Fire Code* and the standards listed in this code shall be conducted at the expense of the owner or the owner's representative. It shall be unlawful to occupy portions of a structure until the required fire protection systems within that portion of the structure have been tested and approved.

**901.6 Supervisory service.** Where required, fire protection systems shall be monitored by an approved supervising station in accordance with NFPA 72.

**901.6.1 Automatic sprinkler systems.** Automatic sprinkler systems shall be monitored by an approved supervising station.

**Exceptions:**

1. A supervising station is not required for automatic sprinkler systems protecting one- and two-family dwellings.
2. Limited area systems serving fewer than 20 sprinklers.

**901.6.2 Fire alarm systems.** Fire alarm systems required by the provisions of Section 907.2 of this code and Sections 907.2 and 907.9 of the *California Fire Code* shall be

monitored by an approved supervising station in accordance with Section 907.6.5.

**Exceptions:**

1. Single- and multiple-station smoke alarms required by Section 907.2.11.
2. Smoke detectors in Group I-3 occupancies.
3. Supervisory service is not required for automatic sprinkler systems in one- and two-family dwellings.

**901.6.3 Group H.** Supervision and monitoring of emergency alarm, detection and automatic fire-extinguishing systems in Group H occupancies shall be in accordance with the *California Fire Code*.

**901.7 Fire areas.** Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with this chapter, such fire areas shall be separated by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, having a fire-resistance rating of not less than that determined in accordance with Section 707.3.10.

**[F] 901.8 Pump and riser room size.** Fire pump and automatic sprinkler system riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working room around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and automatic sprinkler system riser rooms shall be provided with a door(s) and unobstructed passageway large enough to allow removal of the largest piece of equipment.

### SECTION 902 DEFINITIONS

**902.1 Definitions.** The following terms are defined in Chapter 2:

**[F] ALARM NOTIFICATION APPLIANCE.**

**[F] ALARM SIGNAL.**

**[F] ALARM VERIFICATION FEATURE.**

**[F] ANNUNCIATOR.**

**[F] AUDIBLE ALARM NOTIFICATION APPLIANCE.**

**[F] AUTOMATIC.**

**[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM.**

**[F] AUTOMATIC SMOKE DETECTION SYSTEM.**

- [F] AUTOMATIC SPRINKLER SYSTEM.
- [F] AVERAGE AMBIENT SOUND LEVEL.
- [F] CARBON DIOXIDE EXTINGUISHING SYSTEMS.
- [F] CEILING LIMIT.
- [F] CLEAN AGENT.
- [F] CONSTANTLY ATTENDED LOCATION.
- [F] DELUGE SYSTEM.
- [F] DETECTOR, HEAT.
- [F] DRY-CHEMICAL EXTINGUISHING AGENT.
- [F] ELEVATOR GROUP.
- [F] EMERGENCY ALARM SYSTEM.
- [F] EMERGENCY VOICE/ALARM COMMUNICATIONS.
- [F] FIRE ALARM BOX, MANUAL.
- [F] FIRE ALARM CONTROL UNIT.
- [F] FIRE ALARM SIGNAL.
- [F] FIRE ALARM SYSTEM.

#### **| | FIRE APPLIANCE**

- FIRE AREA.
- [F] FIRE COMMAND CENTER.
- [F] FIRE DETECTOR, AUTOMATIC.
- [F] FIRE PROTECTION SYSTEM.
- [F] FIRE SAFETY FUNCTIONS.
- [F] FOAM-EXTINGUISHING SYSTEM.
- [F] HALOGENATED EXTINGUISHING SYSTEM.
- [F] INITIATING DEVICE.
- [F] MANUAL FIRE ALARM BOX.
- [F] MULTIPLE-STATION ALARM DEVICE.
- [F] MULTIPLE-STATION SMOKE ALARM.
- [F] NOTIFICATION ZONE.
- [F] NUISANCE ALARM.
- [F] RECORD DRAWINGS.
- [F] SINGLE-STATION SMOKE ALARM.
- [F] SMOKE ALARM.
- [F] SMOKE DETECTOR.
- [F] SMOKEPROOF ENCLOSURE.
- [F] STANDPIPE SYSTEM, CLASSES OF.

Class I system.

Class II system.

Class III system.

#### **[F] STANDPIPE, TYPES OF.**

Automatic dry.

Automatic wet.

Manual dry.

Manual wet.

Semiautomatic dry.

#### **[F] SUPERVISING STATION.**

#### **[F] SUPERVISORY SERVICE.**

#### **[F] SUPERVISORY SIGNAL.**

#### **[F] SUPERVISORY SIGNAL-INITIATING DEVICE.**

#### **[F] TIRES, BULK STORAGE OF.**

#### **[F] TROUBLE SIGNAL.**

#### **[F] VISIBLE ALARM NOTIFICATION APPLIANCE.**

#### **[F] WET-CHEMICAL EXTINGUISHING SYSTEM.**

#### **[F] WIRELESS PROTECTION SYSTEM.**

#### **[F] ZONE.**

#### **[F] ZONE, NOTIFICATION.**

### **SECTION 903 AUTOMATIC SPRINKLER SYSTEMS**

**[F] 903.1 General.** Automatic sprinkler systems shall comply with this section.

**[F] 903.1.1 Alternative protection.** Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted in lieu of automatic sprinkler protection where recognized by the applicable standard and approved by the fire code official.

**[F] 903.2 Where required.** Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

**[F] 903.2.1 Group A.** An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors from the Group A occupancy to, and including, the nearest level of exit discharge serving the Group A occupancy. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

**[F] 903.2.1.1 Group A-1.** An automatic sprinkler system shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m<sup>2</sup>);
2. The fire area has an occupant load of 300 or more;
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies; or
4. The fire area contains a multitheater complex.

**[F] 903.2.1.2 Group A-2.** An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The fire area exceeds 5,000 square feet ( $464.5 \text{ m}^2$ );
2. The fire area has an occupant load of 100 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. *The structure exceeds 5,000 square feet ( $465 \text{ m}^2$ ), contains more than one fire area containing a Group A-2 occupancy, and is separated into two or more buildings by fire walls of less than four-hour fire-resistance rating without openings.*

**[F] 903.2.1.3 Group A-3.** An automatic sprinkler system shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet ( $1115 \text{ m}^2$ );
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.
4. *The structure exceeds 12,000 square feet ( $1155 \text{ m}^2$ ), contains more than one fire area containing exhibition and display rooms, and is separated into two or more buildings by fire walls of less than four-hour fire-resistance rating without openings.*

**[F] 903.2.1.4 Group A-4.** An automatic sprinkler system shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet ( $1115 \text{ m}^2$ );
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

**[F] 903.2.1.5 Group A-5.** An automatic sprinkler system shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas in excess of 1,000 square feet ( $93 \text{ m}^2$ ).

**[F] 903.2.2 Ambulatory care facilities.** An automatic sprinkler system shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation, whether rendered incapable by staff or staff has accepted responsibility for care recipients already incapable.
2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.

In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor where such care is provided as well as all floors below, and all floors between the level of ambulatory care and the nearest level of exit discharge, including the level of exit discharge.

**[F] 903.2.3 Group E.** An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 12,000 square feet ( $1115 \text{ m}^2$ ) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

**Exception:** An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has at least one exterior exit door at ground level.

3. *In rooms or areas with special hazards such as laboratories, vocational shops and other such areas where hazardous materials in quantities not exceeding the maximum allowable quantity are used or stored.*
4. *Throughout any Group E structure greater than 12,000 square feet ( $1115 \text{ m}^2$ ) in area, which contains more than one fire area, and which is separated into two or more buildings by fire walls of less than four hour fire resistance rating without openings.*

5. *For public school state funded construction projects see Section 903.2.19.*

**[F] 903.2.4 Group F-1.** An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 fire area exceeds 12,000 square feet ( $1115 \text{ m}^2$ ).
2. A Group F-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet ( $2230 \text{ m}^2$ ).
4. A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet ( $232 \text{ m}^2$ ).

**[F] 903.2.4.1 Woodworking operations.** An automatic sprinkler system shall be provided throughout all Group F-1 occupancy fire areas that contain woodworking operations in excess of 2,500 square feet ( $232 \text{ m}^2$ ) in area which generate finely divided combustible waste or use finely divided combustible materials. *[SFM] A fire wall of less than four-hour fire-resistance rating without openings, or any fire wall with openings, shall not be used to establish separate fire areas.*

**[F] 903.2.5 Group H.** Automatic sprinkler systems shall be provided in high-hazard occupancies as required in Sections 903.2.5.1 through 903.2.5.3.

**[F] 903.2.5.1 General.** An automatic sprinkler system shall be installed in Group H occupancies.

**[F] 903.2.5.2 Group H-5.** An automatic sprinkler system shall be installed throughout buildings containing Group H-5 occupancies. The design of the sprinkler system shall not be less than that required by this code for the occupancy hazard classifications in accordance with Table 903.2.5.2. Where the design area of the sprinkler system consists of a corridor protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

**[F] TABLE 903.2.5.2  
GROUP H-5 SPRINKLER DESIGN CRITERIA**

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

**[F] 903.2.5.3 Pyroxylin plastics.** An automatic sprinkler system shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg).

**[F] 903.2.5.4 Group H occupancies located above the 10th story.** The fire sprinkler system shall be designed and zoned to provide separate indication upon water-flow for each side of the 2-hour fire-smoke barrier above the 10th story.

**[F] 903.2.6 Group I.** An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

**Exceptions:**

1. Those areas exempted by Section 407.6 of the California Building Code.
2. Pursuant to health and Safety Code Section 13113(d), Group I-2 occupancies, or any alterations thereto, located in Type IA construction in existence on March 4, 1972.

**[F] 903.2.6.1 Group I-2.** In an existing, unsprinklered Group I-2, nurses' station open to fire-resistive exit access corridors shall be protected by an automatic sprinkler system located directly above the nurses' station. It shall be permitted to connect the automatic sprinkler system to the domestic water service.

**[F] 903.2.6.2 Group I-3.** Every building, or portion thereof, where inmates or persons are in custody or restrained shall be protected by an automatic sprinkler

system conforming to NFPA 13. The main sprinkler control valve or valves and all other control valves in the system shall be locked in the open position and electrically supervised so that at least an audible and visual alarm will sound at a constantly attended location when valves are closed. The sprinkler branch piping serving cells may be embedded in the concrete construction.

**[F] 903.2.7 Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet ( $1115\text{ m}^2$ ).
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet ( $2230\text{ m}^2$ ).
4. A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet ( $464\text{ m}^2$ ).
5. The structure exceeds 24,000 square feet ( $465\text{ m}^2$ ), contains more than one fire area containing a Group M occupancy, and is separated into two or more buildings by fire walls of less than 4-hour fire resistance rating without openings.

**[F] 903.2.7.1 High-piled storage.** An automatic sprinkler system shall be provided in accordance with the California Fire Code in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

**[F] 903.2.8 Group R.** An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

**Exceptions:**

1. Existing Group R-3 occupancies converted to Group R-3.1 occupancies not housing bedridden clients, not housing nonambulatory clients above the first floor and not housing clients above the second floor.
2. Existing Group R-3 occupancies converted to Group R-3.1 occupancies housing only one bedridden client and complying with Section 425.8.3.3.
3. Pursuant to Health and Safety Code Section 13113 occupancies housing ambulatory children only, none of whom are mentally ill or mentally retarded, and the buildings or portions thereof in which such children are housed are not more than two stories in height, and buildings or portions thereof housing such children have an auto-

*matic fire alarm system activated by approved smoke detectors.*

4. Pursuant to Health and Safety Code Section 13143.6 occupancies licensed for protective social care which house ambulatory clients only, none of whom is a child (under the age of 18 years), or who is elderly (65 years of age or over).

*When not used in accordance with Section 504.2 or 506.3 an automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be allowed in Group R-2.1 occupancies.*

*An automatic sprinkler system designed in accordance with Section 903.3.1.3 shall not be utilized in Group R-2.1 or R-4 occupancies.*

**[F] 903.2.8.1 Group R-3 congregate residences.** An automatic sprinkler system installed in accordance with Section 903.3.1.3 shall be permitted in Group R-3 or congregate residences with 16 or fewer residents.

**[F] 903.2.9 Group S-1.** An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet ( $1115 \text{ m}^2$ ).
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet ( $2230 \text{ m}^2$ ).
4. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet ( $464 \text{ m}^2$ ).
5. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet ( $232 \text{ m}^2$ ).

**[F] 903.2.9.1 Repair garages.** An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet ( $929 \text{ m}^2$ ).
2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet ( $1115 \text{ m}^2$ ).
3. Buildings with repair garages servicing vehicles parked in basements.
4. A Group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 5,000 square feet ( $464 \text{ m}^2$ ).

**[F] 903.2.9.2 Bulk storage of tires.** Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet ( $566 \text{ m}^3$ ) shall be equipped

throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**[F] 903.2.10 Group S-2 enclosed parking garages.** An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.6 as follows:

1. Where the fire area of the enclosed parking garage exceeds 12,000 square feet ( $1115 \text{ m}^2$ ); or
2. Where the enclosed parking garage is located beneath other groups.

**[F] 903.2.10.1 Commercial parking garages.** An automatic sprinkler system shall be provided throughout buildings used for storage of commercial trucks or buses where the fire area exceeds 5,000 square feet ( $464 \text{ m}^2$ ).

**[F] 903.2.11 Specific building areas and hazards.** In all occupancies other than Group U, an automatic sprinkler system shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

**[F] 903.2.11.1 Stories without openings.** An automatic sprinkler system shall be installed throughout all stories, including basements, of all buildings where the floor area exceeds 1,500 square feet ( $139.4 \text{ m}^2$ ) and where there is not provided at least one of the following types of exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).
2. Openings entirely above the adjoining ground level totaling at least 20 square feet ( $1.86 \text{ m}^2$ ) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm). The height of the bottom of the clear opening shall not exceed 44 inches (1118 mm) measured from the floor.

**[F] 903.2.11.1.1 Opening dimensions and access.** Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that fire fighting or rescue cannot be accomplished from the exterior.

**[F] 903.2.11.1.2 Openings on one side only.** Where openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet (22 860 mm) from such openings, the story shall

be equipped throughout with an approved automatic sprinkler system, or openings as specified above shall be provided on at least two sides of the story.

**[F] 903.2.11.1.3 Basements.** Where any portion of a basement is located more than 75 feet (22 860 mm) from openings required by Section 903.2.11.1, or where walls, partitions or other obstructions are installed that restrict the application of water from hose streams, the basement shall be equipped throughout with an approved automatic sprinkler system.

**[F] 903.2.11.2 Rubbish and linen chutes.** An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes shall have additional sprinkler heads installed at alternate floors and at the lowest intake. Where a rubbish chute extends through a building more than one floor below the lowest intake, the extension shall have sprinklers installed that are recessed from the drop area of the chute and protected from freezing in accordance with Section 903.3.1.1. Such sprinklers shall be installed at alternate floors, beginning with the second level below the last intake and ending with the floor above the discharge. Chute sprinklers shall be accessible for servicing.

**[F] 903.2.11.3 Buildings 55 feet or more in height.** An automatic sprinkler system shall be installed throughout buildings with a floor level having an occupant load of 30 or more that is located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access.

#### Exceptions:

1. Airport control towers.
2. Open parking structures.
3. Occupancies in Group F-2.

**[F] 903.2.11.4 Ducts conveying hazardous exhausts.** Where required by the *California Mechanical Code*, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, or flammable or combustible materials.

**Exception:** Ducts in which the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).

**[F] 903.2.11.5 Commercial cooking operations.** An automatic sprinkler system shall be installed in commercial kitchen exhaust hood and duct system where an automatic sprinkler system is used to comply with Section 904.

**[F] 903.2.11.6 Other required suppression systems.** In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.11.6 also require the installation of a fire suppression system for certain buildings and areas.

**[F] TABLE 903.2.11.6  
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS**

SECTION	SUBJECT
914.2.1	Covered malls
914.3.1	High-rise buildings
402.10	Covered malls
403.3	High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access
404.3	Atriums
405.3	Underground structures
407.6	Group I-2
410.7	Stages
411.4	Special amusement buildings
412.4.6, 412.4.6.1, 412.6.5	Aircraft hangars
415.10.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
430	Horse racing stables
431	Pet kennels
439	Public libraries
507	Unlimited area buildings
509.4	Incidental uses
1028.6.2.3	Smoke-protected assembly seating
CFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the <i>California Fire Code</i>

For SI: 1 cubic foot = 0.23 m<sup>3</sup>.

**[F] 903.2.12 During construction.** Automatic sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with Chapter 33 of the *California Fire Code*.

#### 903.2.13 Reserved.

#### 903.2.14 Motion picture and television production studio sound stages, approved production facilities and production locations.

**903.2.14.1 Existing sound stages and approved production facilities.** All existing sound stages and approved production facilities equipped with an automatic fire sprinkler system shall be maintained in accordance with the provisions of California Fire Code Chapter 9.

**903.2.14.2 New sound stages.** All new sound stages shall be equipped with an approved automatic fire sprinkler system. The system shall be installed in accordance with the provisions of the California Fire Code Chapter 9 and shall meet the minimum design requirements of an Extra Hazard, Group 2 system.

**903.2.15 Automatic sprinkler system—existing highrise buildings.** See Section 3414.27.

**903.2.15.1 Existing Group R-1 and R-2 high-rise buildings fire-extinguishing systems.** See Section 3413.13.3.

**903.2.16 Group L occupancies.** An automatic sprinkler system shall be installed throughout buildings housing Group L occupancies. Sprinkler system design for research laboratories and similar areas of a Group L occupancy shall not be less than that required for Ordinary Hazard Group 2 with a design area of not less than 3,000 square feet ( $279 \text{ m}^2$ ).

In mixed occupancies, portions of floors or buildings not classified as Group L occupancies shall be provided with sprinkler protection designed of not less than that required for Ordinary Hazard Group 1 with a design area of not less than 3,000 square feet ( $279 \text{ m}^2$ ).

**903.2.16.1 Group L occupancies located above the 10th story.** The automatic sprinkler system shall be designed and zoned to provide separate indication upon water-flow for each side of the 2-hour fire-smoke barrier above the 10th story.

#### 903.2.17 Fixed guideway transit systems.

**903.2.17.1 Automatic sprinkler system.** An automatic sprinkler system shall be installed in all stations of fixed guideway transit systems.

##### Exceptions:

1. Guideways when the closest sprinkler heads to the guideway are within 3 feet (914 mm) of the edge, over the platform, and spaced 6 feet (1829 mm) on center parallel to the guideway
2. Station agent booths not exceeding 150 square feet ( $13.9 \text{ m}^2$ ) in area, when provided with an approved smoke detector connected to the building fire alarm system
3. Power substations
4. Machinery rooms, electrical rooms and train control rooms protected by an approved automatic fixed fire-extinguishing system
5. Open stations
6. Station platform areas open to three or more sides

**903.2.17.2 Station guideway deluge system.** Underground stations and stations in open cuts with walls 5 feet (1524 mm) above the top of the running rail and with a raised platform shall be provided with an under-vehicle guideway manually activated deluge sprinkler system. In open cut stations, such system shall be provided in guideways which are situated between a raised platform edge and a retaining wall.

**903.2.17.2.1** Systems shall be provided along the entire length of track at each station platform.

**903.2.17.2.2** Deluge nozzles with caps shall be located in the approximate center of track with spacing designed to completely wet the undersides of the vehicle at the applied density.

**903.2.17.2.3** System density shall be a minimum of 0.19 gallon per minute (gpm) per square foot ( $0.72 \text{ L/m per m}^2$ ) for the design area. When more than one zone is provided, two adjacent zones are required to be considered operating for calculating purposes.

**903.2.17.2.4** Deluge systems shall be directly connected to a water supply capable of supplying the required flow rate for a minimum 30-minute duration.

**903.2.17.2.5** Controls or manually operable valves shall be in a location acceptable to the Fire Code Official. All deluge systems shall be monitored by the station fire alarm system.

**903.2.17.2.6** Each valve shall be monitored by a separate circuit. The alarm panel shall be located in an area normally occupied by station personnel or signals shall be transmitted to the operations control center (OCC).

**903.2.18 Group U private garages and carports accessory to Group R-3 occupancies.** Carports with habitable space above and attached garages, accessory to Group R-3 occupancies, shall be protected by residential fire sprinklers in accordance with this section. Residential fire sprinklers shall be connected to, and installed in accordance with, an automatic residential fire sprinkler system that complies with Section R313 of the California Residential Code or with NFPA 13D. Fire sprinklers shall be residential sprinklers or quick-response sprinklers, designed to provide a minimum density of 0.05 gpm/ft<sup>2</sup> (2.04 mm/min) over the area of the garage and/or carport, but not to exceed two sprinklers for hydraulic calculation purposes. Garage doors shall not be considered obstructions with respect to sprinkler placement.

**Exception:** An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing carports and/or garages that do not have an automatic residential fire sprinkler system installed in accordance with this section.

**903.2.19 Public school state funded construction projects for kindergarten through 12th grade - automatic sprinkler system requirements.**

**903.2.19.1 New public school campus.** An automatic sprinkler system shall be provided in all occupancies. The provisions of this section shall apply to any public school project consisting of one or more buildings on a new school campus and receiving state funds pursuant to Leroy F. Greene School Facilities Act of 1998, California Education Code sections 17070.10 through 17079. For purposes of this section, new campus refers to a school site, where an application for construction

*of original buildings was made to DSA on or after July 1, 2002.*

**Exceptions:**

1. A relocatable building that is sited with the intent that it be at the site for less than three years and is sited upon a temporary foundation in a manner that is designed to permit easy removal. Also see CCR, Title 24, Part 1, California Administrative Code, Section 4-314 for definition of relocatable building.
2. Detached buildings designed and used for non-instructional purposes that meet the applicable requirements for that occupancy. Buildings would include, but not be limited to:

*Concession Stand*

*Press Box*

*Restroom Facilities*

*Shade Structure*

*Snack Bar*

*Storage Building*

*Ticket Booth*

**903.2.19.1.1** Sprinklers shall be installed in spaces where the ceiling creates a "ceiling-plenum" or space above the ceiling is utilized for environmental air.

**903.2.19.1.2 Fire-resistive substitution for new campus.** A new public school campus shall be entitled to include in the design and construction documents all of the applicable fire-resistive construction substitutions as permitted by this code.

**[F] 903.3 Installation requirements.** Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.8.

**[F] 903.3.1 Standards.** Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1 unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

**[F] 903.3.1.1 NFPA 13 sprinkler systems.** Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 as amended in Chapter 35 except as provided in Section 903.3.1.1.1.

**[F] 903.3.1.1.1 Exempt locations.** In other than Group I-2, I-2.1 and I-3 occupancies automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Fire service access elevator machine rooms and machinery spaces.
4. Machine rooms and machinery spaces associated with occupant evacuation elevators designed in accordance with Section 3008.
5. Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, and associated electrical power distribution equipment, provided those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 712, or both.
6. Solar photovoltaic panel structures with no use underneath. Signs may be provided, as determined by the enforcing agency prohibiting any use underneath including storage.
7. Solar photovoltaic (PV) panels supported by framing that have sufficient uniformly distributed and unobstructed openings throughout the top of the array (horizontal plane) to allow heat and gases to escape, as determined by the enforcing agency.

**[F] 903.3.1.2 NFPA 13R sprinkler systems.** Automatic sprinkler systems in Group R occupancies up to and including four stories in height shall be permitted to be installed throughout in accordance with NFPA 13R as amended in Chapter 35.

**[F] 903.3.1.2.1 Balconies and decks.** Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

**[F] 903.3.1.3 NFPA 13D sprinkler systems.** Automatic sprinkler systems installed in one- and two-family dwellings, Group R-3 congregate residences and townhouses shall be permitted to be installed throughout in accordance with NFPA 13D as amended in Chapter 35.

**[F] 903.3.2 Quick-response and residential sprinklers.** Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing care recipient sleeping units in Group I-2 in accordance with this code.
2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.
3. Dwelling units and sleeping units in Group R occupancies.
4. Light-hazard occupancies as defined in NFPA 13.

**[F] 903.3.3 Obstructed locations.** Automatic sprinklers shall be installed with due regard to obstructions that will delay activation or obstruct the water distribution pattern. Automatic sprinklers shall be installed in or under covered kiosks, displays, booths, concession stands, or equipment that exceeds 4 feet (1219 mm) in width. Not less than a 3-foot (914 mm) clearance shall be maintained between automatic sprinklers and the top of piles of combustible fibers.

**Exception:** Kitchen equipment under exhaust hoods protected with a fire-extinguishing system in accordance with Section 904.

**[F] 903.3.4 Actuation.** Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

**[F] 903.3.5 Water supplies.** Water supplies for automatic sprinkler systems shall comply with this section and the standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with *Health and Safety Code Section 13114.7*.

**[F] 903.3.5.1 Domestic services.** Where the domestic service provides the water supply for the automatic sprinkler system, the supply shall be in accordance with this section.

**[F] 903.3.5.1.1 Limited area sprinkler systems.** Limited area sprinkler systems serving fewer than 20 sprinklers on any single connection are permitted to be connected to the domestic service where a wet automatic standpipe is not available. Limited area sprinkler systems connected to domestic water supplies shall comply with each of the following requirements:

1. Valves shall not be installed between the domestic water riser control valve and the sprinklers.

**Exception:** An approved indicating control valve supervised in the open position in accordance with Section 903.4.

2. The domestic service shall be capable of supplying the simultaneous domestic demand and the sprinkler demand required to be hydraulically calculated by NFPA 13, NFPA 13D or NFPA 13R.

**[F] 903.3.5.1.2 Residential combination services.** A single combination water supply shall be allowed provided that the domestic demand is added to the sprinkler demand as required by NFPA 13R.

**[F] 903.3.5.2 Secondary water supply.** An automatic secondary on-site water supply having a *usable capacity of not less than the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 ft above the lowest level of fire department vehicle access assigned to Seismic Design Category C, D, E or F as determined by the California Building Code.* An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the automatic sprinkler system. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13, whichever is greater. *The Class I standpipe system demand shall not be required to be included in the secondary on-site water supply calculations. In no case shall the secondary on-site water supply be less than 15,000 gallons.*

**Exception:** Existing buildings.

**[F] 903.3.6 Hose threads.** Fire hose threads and fittings used in connection with automatic sprinkler systems shall be as prescribed by the fire code official.

**[F] 903.3.7 Fire department connections.** *The location of fire department connections shall be approved by the fire code official.*

**[F] 903.3.8 Floor control valves.** *Floor control valves and waterflow detection assemblies shall be installed at each floor where any of the following occur:*

1. *Buildings where the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access*
2. *Buildings that are four or more stories in height*
3. *Buildings that are two or more stories below the highest level of fire department vehicle access*

**Exception:** *Group R-3 and R-3.1 occupancies floor control valves and waterflow detection assemblies shall not be required.*

**[F] 903.4 Sprinkler system supervision and alarms.** All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit.

**Exceptions:**

1. Automatic sprinkler systems protecting one- and two-family dwellings.

2. Limited area systems serving fewer than 20 sprinklers.
3. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

**[F] 903.4.1 Monitoring.** Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.

**Exceptions:**

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

**[F] 903.4.2 Alarms.** One exterior approved audible device, located on the exterior of the building in an approved location, shall be connected to each automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system. *Visible alarm notification appliances shall not be required except when required by Section 907.*

**[F] 903.4.3 Floor control valves.** Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access.

**[F] 903.5 Testing and maintenance.** Sprinkler systems shall be tested and maintained in accordance with the *California Fire Code*.

## SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

**[F] 904.1 General.** Automatic fire-extinguishing systems, other than automatic sprinkler systems, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

**[F] 904.2 Where required.** Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the fire code official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

**[F] 904.2.1 Commercial hood and duct systems.** Each required commercial kitchen exhaust hood and duct system required by Section 609 of the *California Fire Code* or Chapter 5 of the *California Mechanical Code* to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

**[F] 904.3 Installation.** Automatic fire-extinguishing systems shall be installed in accordance with this section.

**[F] 904.3.1 Electrical wiring.** Electrical wiring shall be in accordance with *California Electrical Code*.

**[F] 904.3.2 Actuation.** Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.11.1. Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

**Exception:** Multiple systems shall be permitted to be installed if they are designed to operate simultaneously.

**[F] 904.3.3 System interlocking.** Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

**[F] 904.3.4 Alarms and warning signs.** Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible and visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun. Audible signals shall be in accordance with Section 907.5.2.

**[F] 904.3.5 Monitoring.** Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

**[F] 904.4 Inspection and testing.** Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

**[F] 904.4.1 Inspection.** Prior to conducting final acceptance tests, the following items shall be inspected:

1. Hazard specification for consistency with design hazard.
2. Type, location and spacing of automatic- and manual-initiating devices.
3. Size, placement and position of nozzles or discharge orifices.
4. Location and identification of audible and visible alarm devices.
5. Identification of devices with proper designations.
6. Operating instructions.

**[F] 904.4.2 Alarm testing.** Notification appliances, connections to fire alarm systems and connections to approved supervising stations shall be tested in accordance with this section and Section 907 to verify proper operation.

**[F] 904.4.2.1 Audible and visible signals.** The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

**[F] 904.4.3 Monitor testing.** Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from automatic fire-extinguishing systems.

**[F] 904.5 Wet-chemical systems.** Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 5* and NFPA 17A and their listing.

**[F] 904.6 Dry-chemical systems.** Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 5* and NFPA 17 and their listing.

**[F] 904.7 Foam systems.** Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 5*, NFPA 11 and NFPA 16 and their listing.

**[F] 904.8 Carbon dioxide systems.** Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 5* and NFPA 12 and their listing.

**[F] 904.9 Halon systems.** Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 5* and NFPA 12A and their listing.

**[F] 904.10 Clean-agent systems.** Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *California Code of*

*Regulations, Title 19, Division 1, Chapter 5* and NFPA 2001 and their listing.

**[F] 904.11 Commercial cooking systems.** Commercial cooking equipment that produces grease-laden vapors shall be provided with a Type I Hood, in accordance with the California Mechanical Code, and an automatic fire extinguishing system that is listed and labeled for its intended use as follows:

1. Wet chemical extinguishing system, complying with UL 300.
2. Carbon dioxide extinguishing systems.
3. Automatic fire sprinkler systems.

All existing dry chemical and wet chemical extinguishing systems shall comply with UL 300.

**Exception:** Public schools kitchens, without deep-fat fryers, shall be upgraded to a UL 300-compliant system during state-funded modernization projects that are under the jurisdiction of the Division of the State Architect.

All systems shall be installed in accordance with the California Mechanical Code, appropriate adopted standards, their listing and the manufacturer's installation instructions.

**Exception:** Factory-built commercial cooking recirculating systems that are tested, listed, labeled and installed in accordance with UL 710B and the California Mechanical Code.

**[F] 904.11.1 Manual system operation.** A manual actuation device shall be located at or near a means of egress from the cooking area a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) or less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

**Exception:** Automatic sprinkler systems shall not be required to be equipped with manual actuation means.

**[F] 904.11.2 System interconnection.** The actuation of the fire suppression system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

**[F] 904.11.3 Carbon dioxide systems.** When carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). Dampers shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the damper is installed at the top of the duct, the top nozzle shall be immediately below the damper. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect against all hazards venting through a common duct simultaneously.

**[F] 904.11.3.1 Ventilation system.** Commercial-type cooking equipment protected by an automatic carbon dioxide-extinguishing system shall be arranged to shut off the ventilation system upon activation.

**[F] 904.11.4 Special provisions for automatic sprinkler systems.** Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified.

**[F] 904.11.4.1 Listed sprinklers.** Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, listed for that application and installed in accordance with their listing.

## SECTION 905 STANDPIPE SYSTEMS

**[F] 905.1 General.** Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire hose threads used in connection with standpipe systems shall be approved and shall be compatible with fire department hose threads. The location of fire department hose connections shall be approved. In buildings used for high-piled combustible storage, fire protection shall be in accordance with the *California Fire Code*.

**[F] 905.2 Installation standard.** Standpipe systems shall be installed in accordance with this section and NFPA 14 as amended in Chapter 35.

**[F] 905.3 Required installations.** Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.11.1. Standpipe systems are allowed to be combined with automatic sprinkler systems.

**Exception:** Standpipe systems are not required in Group R-3 occupancies.

**[F] 905.3.1 Height.** *In other than Group R-3 and R-3.1 occupancies, Class III standpipe systems shall be installed throughout at each floor where any of the following occur:*

1. *Buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of fire department vehicle access.*
2. *Buildings that are four or more stories in height.*
3. *Buildings where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.*
4. *Buildings that are two or more stories below the highest level of fire department vehicle access.*

**Exceptions:**

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I manual standpipes are allowed in open parking garages where the highest floor is located

not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.

3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider:
  - 5.1. Recessed loading docks for four vehicles or less; and
  - 5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

**[F] 905.3.2 Group A.** Class I automatic wet standpipes shall be provided in nonsprinklered Group A buildings having an occupant load exceeding 1,000 persons.

**Exceptions:**

1. Open-air-seating spaces without enclosed spaces.
2. Class I automatic dry and semiautomatic dry standpipes or manual wet standpipes are allowed in buildings that are not high-rise buildings.

**[F] 905.3.3 Covered and open mall buildings.** Covered mall and open mall buildings shall be equipped throughout with a standpipe system where required by Section 905.3.1. Mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the automatic sprinkler system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed to not exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passage-way or corridor.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall of a covered mall building.
4. At public entrances at the perimeter line of an open mall building.
5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.

**[F] 905.3.4 Stages.** Stages greater than 1,000 square feet in area ( $93\text{ m}^2$ ) shall be equipped with a Class III wet standpipe system with  $1\frac{1}{2}$ -inch and  $2\frac{1}{2}$ -inch (38 mm and 64 mm) hose connections on each side of the stage.

**Exception:** Where the building or area is equipped throughout with an automatic sprinkler system, a  $1\frac{1}{2}$ -inch (38 mm) hose connection shall be installed in accordance with NFPA 13 or in accordance with NFPA 14 for Class II or III standpipes.

**[F] 905.3.4.1 Hose and cabinet.** The  $1\frac{1}{2}$ -inch (38 mm) hose connections shall be equipped with sufficient lengths of  $1\frac{1}{2}$ -inch (38 mm) hose to provide fire protection for the stage area. Hose connections shall be equipped with an approved adjustable fog nozzle and be mounted in a cabinet or on a rack.

**[F] 905.3.5 Underground buildings.** Underground buildings shall be equipped throughout with a Class I automatic wet or manual wet standpipe system.

**[F] 905.3.6 Heliports and helipads.** Buildings with a rooftop helistop or heliport shall be equipped with a Class I or III standpipe system extended to the roof level on which the helistop or heliport is located in accordance with Section 2007.5 of the *California Fire Code*.

**[F] 905.3.7 Marinas and boatyards.** Standpipes in marinas and boatyards shall comply with Chapter 36 of the *California Fire Code*.

**[F] 905.3.8 Rooftop gardens and landscaped roofs.** Buildings or structures that have rooftop gardens or landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the rooftop garden or landscaped roof is located.

**[F] 905.3.9 Smokeproof enclosures.** For smokeproof enclosures see Section 909.20.

**[F] 905.3.10 Group I-3.** Housing units within cell complexes where 50 or more inmates are restrained, shall be provided with Class I wet standpipes. In addition, Class I wet standpipes shall be located so that it will not be necessary to extend hose lines through interlocking security doors and any doors in smoke-barrier walls, horizontal fire walls or fire barrier walls. Standpipes located in cell complexes may be placed in secured pipe chases.

**[F] 905.3.11 Fixed guideway transit systems.** Underground stations shall be provided with a class III standpipe system designed to comply with the following:

1. Automatically supply 65 pounds per square inch (psi) for each outlet.
2. Supply a 250 gpm (946 L/m) flow to each of the two most remote  $2\frac{1}{2}$  inch (64 mm) outlets when pressurized through the fire department connection(s).

**[F] 905.3.11.1** All other stations shall be provided with a class I manual wet standpipe system; a manual dry class I standpipe system may be allowed in areas subject to freezing.

**Exception:** Open at-grade stations with unrestricted fire department access need not be provided with a standpipe system.

**[F] 905.4 Location of Class I standpipe hose connections.** Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise *approved* by the fire code official. See Section 909.20.3.2 for additional provisions in smokeproof ||| enclosures.
2. On each side of the wall adjacent to the exit opening of a horizontal exit.

**Exception:** Where floor areas adjacent to a horizontal exit are reachable from exit stairway hose connections by a nozzle attached to 100 feet (30 480 mm) of hose as measured along the path of travel, a hose connection shall not be required at the horizontal exit.

3. In every exit passageway, at the entrance from the exit passageway to other areas of a building.

**Exception:** Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.16.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in approved locations. The distances from a hose connection shall be measured along the path of travel.

**[F] 905.4.1 Protection.** Risers and laterals of Class I standpipe systems not located within an enclosed stairway or pressurized enclosure shall be protected by a degree of fire resistance equal to that required for vertical enclosures in the building in which they are located.

**Exception:** In buildings equipped throughout with an approved automatic sprinkler system, laterals that are not located within an enclosed stairway or pressurized enclosure are not required to be enclosed within fire-resistance-rated construction.

**[F] 905.4.2 Interconnection.** In buildings where more than one standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

**[F] 905.5 Location of Class II standpipe hose connections.** Class II standpipe hose connections shall be accessible and located so that all portions of the building are within 30 feet (9144 mm) of a listed variable stream fog nozzle attached to 100 feet (30 480 mm) of hose.

**[F] 905.5.1 Groups A-1 and A-2.** In Group A-1 and A-2 occupancies having occupant loads exceeding 1,000 persons, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, on each side of the balcony and on each tier of dressing rooms.

**[F] 905.5.2 Protection.** Fire-resistance-rated protection of risers and laterals of Class II standpipe systems is not required.

**[F] 905.5.3 Class II system 1-inch hose.** A minimum 1-inch (25 mm) hose shall be permitted to be used for hose stations in light-hazard occupancies where investigated and listed for this service and where approved by the fire code official.

**[F] 905.6 Location of Class III standpipe hose connections.** Class III standpipe systems shall have hose connections located as required for Class I standpipes in Section 905.4 and shall have Class II hose connections as required in Section 905.5.

**[F] 905.6.1 Protection.** Risers and laterals of Class III standpipe systems shall be protected as required for Class I systems in accordance with Section 905.4.1.

**[F] 905.6.2 Interconnection.** In buildings where more than one Class III standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

**[F] 905.7 Cabinets.** Cabinets containing fire-fighting equipment such as standpipes, fire hoses, fire extinguishers or fire department valves shall not be blocked from use or obscured from view.

**[F] 905.7.1 Cabinet equipment identification.** Cabinets shall be identified in an approved manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein.

**Exceptions:**

1. Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein.
2. Doors that have either an approved visual identification clear glass panel or a complete glass door panel are not required to be marked.

**[F] 905.7.2 Locking cabinet doors.** Cabinets shall be unlocked.

**Exceptions:**

1. Visual identification panels of glass or other approved transparent frangible material that is easily broken and allows access.

2. Approved locking arrangements.

3. Group I-3.

**[F] 905.8 Dry standpipes.** Dry standpipes shall not be installed.

**Exception:** Where subject to freezing and in accordance with NFPA 14.

**[F] 905.9 Valve supervision.** Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the control unit.

**Exceptions:**

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.
2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.

**[F] 905.10 During construction.** Standpipe systems required during construction and demolition operations shall be provided in accordance with Section 3311.

## SECTION 906 PORTABLE FIRE EXTINGUISHERS

**[F] 906.1 Where required.** Portable fire extinguishers shall be installed in the following locations.

1. In Group A, B, E, F, H, I, L, M, R-1, R-2, R-2.1, R.3.1, R-4 and S occupancies.

**Exception:** In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.

2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1 of the California Fire Code.
5. Where required by the California Fire Code sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the fire code official.
7. Large and small family day-care homes shall be equipped with a portable fire extinguisher having a minimum 2A10BC rating.
8. Where required by California Code of Regulations, Title 19, Division 1, Chapter 3.

**[F] TABLE 906.1  
ADDITIONAL REQUIRED PORTABLE FIRE  
EXTINGUISHERS IN THE CALIFORNIA FIRE CODE**

IFC SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.2	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3104.12	Tents and membrane structures
3206.1	Rack storage
3315.1	Buildings under construction or demolition
3317.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
5203.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5906.5.7	Flammable solids
6108.2	LP-gas

**[F] 906.2 General requirements.** Portable fire extinguishers shall be selected and installed in accordance with this section and *California Code of Regulations, Title 19, Division 1, Chapter 3*.

**Exceptions:**

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

**[F] 906.3 Size and distribution.** The size and distribution of portable fire extinguishers shall be in accordance with Sections 906.3.1 through 906.3.4.

**[F] 906.3.1 Class A fire hazards.** The minimum sizes and distribution of portable fire extinguishers for occupancies that involve primarily Class A fire hazards shall comply with Table 906.3(1).

**[F] TABLE 906.3(1)  
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS**

	LIGHT (Low) HAZARD OCCUPANCY	ORDINARY (Moderate) HAZARD OCCUPANCY	EXTRA (High) HAZARD OCCUPANCY
Minimum Rated Single Extinguisher	2-A <sup>c</sup>	2-A	4-A <sup>a</sup>
Maximum Floor Area Per Unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum Floor Area for Extinguisher <sup>b</sup>	11,250 square feet	11,250 square feet	11,250 square feet
Maximum Travel Distance to Extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m<sup>2</sup>, 1 gallon = 3.785 L.

a. Two 2½-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.

b. *California Code of Regulations, Title 19, Division 1, Chapter 3* concerning application of the maximum floor area criteria.

c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

**[F] 906.3.2 Class B fire hazards.** Portable fire extinguishers for occupancies involving flammable or combustible liquids with depths less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2).

Portable fire extinguishers for occupancies involving flammable or combustible liquids with a depth of greater than 0.25-inch (6.35 mm) shall be selected and placed in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 3*.

[F] TABLE 906.3(2)

**FIRE EXTINGUISHERS FOR FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS LESS THAN OR EQUAL TO 0.25 INCH**

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAXIMUM TRAVEL DISTANCE TO EXTINGUISHERS (feet)
Light (Low)	5-B	30
	10-B	50
Ordinary (Moderate)	10-B	30
	20-B	50
Extra (High)	40-B	30
	80-B	50

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**Note:** For requirements on water-soluble flammable liquids and alternative sizing criteria, see *California Code of Regulations, Title 19, Division 1, Chapter 3*.

**[F] 906.3.3 Class C fire hazards.** Portable fire extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or B hazard.

**[F] 906.3.4 Class D fire hazards.** Portable fire extinguishers for occupancies involving combustible metals shall be selected and placed in accordance with *California Code of Regulations, Title 19, Division 1, Chapter 3*.

**[F] 906.4 Cooking grease fires.** Fire extinguishers provided for the protection of cooking grease fires shall be of an *approved* type compatible with the automatic fire-extinguishing system agent and in accordance with Section 904.11.5 of the *California Fire Code*.

**[F] 906.5 Conspicuous location.** Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the fire code official determines that the hazard posed indicates the need for placement away from normal paths of travel.

**[F] 906.6 Unobstructed and unobscured.** Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, means shall be provided to indicate the locations of extinguishers.

**[F] 906.7 Hangers and brackets.** Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

**[F] 906.8 Cabinets.** Cabinets used to house portable fire extinguishers shall not be locked.

#### Exceptions:

- Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
- In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

**[F] 906.9 Extinguisher installation.** The installation of portable fire extinguishers shall be in accordance with Sections 906.9.1 through 906.9.3.

**[F] 906.9.1 Extinguishers weighing 40 pounds or less.** Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 5 feet (1524 mm) above the floor.

**[F] 906.9.2 Extinguishers weighing more than 40 pounds.** Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 3.5 feet (1067 mm) above the floor.

**[F] 906.9.3 Floor clearance.** The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall not be less than 4 inches (102 mm).

**[F] 906.10 Wheeled units.** Wheeled fire extinguishers shall be conspicuously located in a designated location.

## SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

**[F] 907.1 General.** This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

**[F] 907.1.1 Construction documents.** Construction documents for fire alarm systems shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code, the *California Fire Code*, and relevant laws, ordinances, rules and regulations, as determined by the fire code official.

**[F] 907.1.2 Fire alarm shop drawings.** Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation, and shall include, but not be limited to, all of the following:

- A floor plan that indicates the use of all rooms.
- Locations of alarm-initiating devices.
- Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.
- Location of fire alarm control unit, transponders and notification power supplies.
- Annunciators.
- Power connection.
- Battery calculations.
- Conductor type and sizes.
- Voltage drop calculations.
- Manufacturers' data sheets indicating model numbers and listing information for equipment, devices and materials.
- Details of ceiling height and construction.
- The interface of fire safety control functions.

13. Classification of the supervising station.
14. *All plans and shop drawings shall use the symbols identified in NFPA 170, Standard for Fire Safety and Emergency Symbols.*

**Exception:** Other symbols are allowed where approved by the enforcing agency.

**[F] 907.1.3 Equipment.** Systems and components shall be California State Fire Marshal listed and approved in accordance with California Code of Regulations, Title 19, Division 1 for the purpose for which they are installed.

**[F] 907.1.4 Fire-walls and fire barrier walls.** For the purpose of Section 907 fire walls and fire barrier walls shall not define separate buildings.

**[F] 907.1.5 Fire alarm use.** A fire alarm system shall not be used for any purpose other than fire warning or mass notification and where permitted by NFPA 72.

**[F] 907.2 Where required—new buildings and structures.** An approved fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, or automatic fire alarm systems, a single fire alarm box shall be installed at a location approved by the enforcing agency.

**Exceptions:**

1. The manual fire alarm box is not required for fire alarm control units dedicated to elevator recall control supervisory service and fire sprinkler monitoring.
2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the fire code official to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.
3. *The manual fire alarm box is not required to be installed when approved by the fire code official.*

**[F] 907.2.1 Group A.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.9 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes with an occupant load of less than 1,000, shall be provided with a fire alarm system as required for the Group E occupancy.

**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

*Every Group A building used for educational purposes shall be provided with a manual or automatic fire alarm system. This provision shall apply to, but shall not necessarily be limited to, every community college and university.*

**Exception:** Privately owned trade or vocational schools or any firm or company which provides educational facilities and instructions for its employees.

**[F] 907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more.** Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2. *Group A occupancies with an occupant load of 10,000 or more, see Section 907.2.1.3.*

**Exception:** Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

**[F] 907.2.1.2 Emergency voice/alarm communication captions.** Stadiums, arenas and grandstands required to caption audible public announcements shall be in accordance with Section 907.5.2.2.4.

**907.2.1.3 Public address system.** Pursuant to Health and Safety Code Section 13108.9, for all buildings or structures constructed on or after July 1, 1991, which are intended for public assemblies of 10,000 or more persons a public address system with an emergency backup power system shall be required.

**[F] 907.2.2 Group B.** A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. The fire area contains an ambulatory care facility.
4. *Group B occupancies containing educational facilities, see Section 907.2.2.2.*

**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**[F] 907.2.2.1 Ambulatory care facilities.** Fire areas containing ambulatory care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory care facility and in public use areas outside of tenant spaces, including public corridors and elevator lobbies.

**Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, provided the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**907.2.2.2 Group B Educational facilities.** Every Group B building used for educational purposes shall be provided with a manual or automatic fire alarm system. This provision shall apply to, but shall not necessarily be limited to, every community college and university.

**Exception:** Privately owned trade or vocational schools or any firm or company which provides educational facilities and instructions for its employees.

**[F] 907.2.3 Group E.** A manual and automatic fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies with an occupant load of 50 or more persons or containing more than one classroom or one or more rooms used for Group E or I-4 day care purposes in accordance with this section. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

**Exceptions:**

1. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
  - 1.1. Interior corridors are protected by smoke detectors.
  - 1.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices.
  - 1.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
  - 1.4. The capability to activate the evacuation signal from a central point is provided.
2. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the emergency voice/alarm communication system will activate on sprinkler

water flow and manual activation is provided from a normally occupied location.

3. For public school state funded construction projects see Section 907.2.29.

**907.2.3.1 System connection.** Where more than one fire alarm control unit is used at the school campus, they shall be interconnected and shall operate all notification appliances.

**Exception:** Interconnection of fire alarm control units is not required when all the following are provided:

1. Buildings that are separated a minimum of 20 feet (6096 mm) and in accordance with the California Building Code; and
2. There is a method of two way communication between each classroom and the school administrative office approved by the fire enforcing agency; and
3. A method of manual activation of each fire alarm system is provided.

**907.2.3.2 Assemblies located within a Group E occupancy.** Assembly occupancies with an occupant load of less than 1,000 and located within a Group E occupancy campus or building shall be provided with a fire alarm system as required for the Group E occupancy.

**907.2.3.3 Notification.** The fire alarm system notification shall comply with the requirements of Section 907.5.

**907.2.3.4 Annunciation.** Annunciation of the fire alarm system shall comply with the requirements of Section 907.6.3.1.

**907.2.3.5 Monitoring.** School fire alarm systems shall be monitored in accordance with Section 907.6.5.2.

**907.2.3.6 Automatic fire alarm system.** Automatic detection shall be provided in accordance with this section.

**907.2.3.6.1 Smoke detectors.** Smoke detectors shall be installed at the ceiling of every room and in "ceiling-plenums" utilized for environmental air. Where the ceiling is attached directly to the underside of the roof structure, smoke detectors shall be installed on the ceiling only.

**Exception:** Where the environment or ambient conditions exceed smoke detector installation guidelines; heat detectors or fire sprinklers shall be used.

**907.2.3.6.2 Heat detectors.** Heat detectors shall be installed in combustible spaces where sprinklers or smoke detectors are not installed.

**907.2.3.7 Private schools.** An automatic fire alarm system shall be provided in new buildings of private schools.

**Exception:** Automatic detection devices are not required where an approved automatic sprinkler system is installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

**907.2.3.8 Day-care, Group E.**

**907.2.3.8.1** An automatic fire alarm system shall be provided in all buildings used as or containing a Group E day-care.

**Exception:** Automatic detection devices are not required where an approved automatic sprinkler system is installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

**907.2.3.8.2** Smoke detectors shall be installed in every room used for sleeping or napping.

**[F] 907.2.4 Group F.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more stories in height; and
2. The Group F occupancy has a combined occupant load of 500 or more above or below the lowest level of exit discharge.

**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

**[F] 907.2.5 Group H.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 60, 62 and 63, respectively, of the *California Fire Code*.

**907.2.5.1 Group H occupancies located above the 10th story.** Manual fire alarm boxes shall be required on each side of the 2-hour fire-smoke barrier and at each exit above the 10th story.

**[F] 907.2.6 Group I.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section

907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

**Exceptions:**

1. Large family day-care.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official.

**[F] 907.2.6.1 Group I-1.** Reserved.

**[F] 907.2.6.2 Group I-2 and Group I-2.1.** A manual and automatic fire alarm system shall be installed in Group I-2 and I-2.1 occupancies. Where automatic fire suppression systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

**Exception:** Where an entire facility is used for the housing of persons, none of whom are physically or mentally handicapped or nonambulatory, and are between the ages of 18 and 64, the buildings or structures comprising such facility shall be exempt from the provisions of this subsection relating to the installation of an automatic fire alarm system.

**907.2.6.2.1 Notification.** The fire alarm notification system shall be in accordance with Section 907.5.2.5.

**907.2.6.2.2 Automatic fire detection.** Smoke detectors shall be provided in accordance with this section.

1. In patient and client sleeping rooms. Actuation of such detectors shall cause a visual display on the corridor side of the room in which the detector is located and shall cause an audible and visual alarm at the respective nurses' station. A nurse call system listed for this function is an acceptable means of providing the audible and visual alarm at the respective nurses' station and corridor room display. Operation of the smoke detector shall not include any alarm verification feature.

**Exception:** In patient and client rooms equipped with existing automatic door closers having integral smoke detector, the integral detector is allowed to substitute for the room smoke detector, provided it meets all the required alerting functions.

2. Group I-2 nurses' stations. A minimum of one (1) smoke detector shall be installed at the nurses' station and centrally located.
3. In waiting areas and corridors onto which they open, in the same smoke compartment, in accordance with Section 407.2.1.

**[F] 907.2.6.3 Group I-3 occupancies.** Group I-3 occupancies shall be equipped with a manual fire alarm sys-

tem and automatic smoke detection system installed for alerting staff.

**Exception:** An automatic smoke detection system is not required within temporary holding cells.

**[F] 907.2.6.3.1 System initiation.** Actuation of an automatic fire-extinguishing system, automatic sprinkler system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal which automatically notifies staff.

**[F] 907.2.6.3.2 Manual fire alarm boxes.** Manual fire alarm boxes are not required to be located in accordance with Section 907.4.2 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

**[F] 907.2.6.3.2.1 Manual fire alarm boxes in detainee areas.** Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

**[F] 907.2.6.3.3 Automatic smoke detection system.** An automatic smoke detection system shall be installed throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally accessible to inmates.

#### Exceptions:

1. Other approved smoke detection arrangements may be used to prevent damage or tampering or for other purposes provided the function of detecting any fire is fulfilled and the location of the detectors is such that the speed of detection will be equivalent to that provided by the spacing and location required in accordance with NFPA 72 as referenced in Chapter 35. This may include the location of detectors in return air ducts from cells, behind grilles or in other locations. Spot type, combination duct and open area smoke detectors may be used when located not more than 14 inches (356mm) from the return air grill. For initiation and annunciation purposes, these detectors may be combined in groups of four. The fire code official having jurisdiction, however, must approve the proposed equivalent performance of the design.
2. For detention housing and/or mental health housing area(s), including correctional medical and mental health uses, automatic smoke detection system in sleeping units shall not be required when all of the following conditions are met:

2.1. All rooms, including the inmate cells are provided with an automatic sprinkler system in accordance with Section 903.3.1.1.

2.2. Building is continuously staffed by a correctional officer at all times.

2.3. The exception to Section 903.2.6.2 shall not apply.

3. Smoke detectors are not required to be installed in inmate cells with two or fewer occupants in detention facilities which do not have a correctional medical and mental health use.

4. Smoke detectors are not required to be installed in inmate day rooms of detention facilities where 24-hour direct visual supervision is provided by a correctional officer(s) and a manual fire alarm box is located in the control room.

**907.2.6.3.4 System annunciation.** A staff alerting fire alarm shall sound at all staff control stations on the floor of activation and an audible and visual signal shall be indicated on an annunciator at the facility control center upon activation of any automatic extinguishing system, automatic detection system, or any smoke detector or manual actuating or initiating device. In addition, where there are staff-control stations on the floor, an audible, visual and manual alarm shall be located in each staff control station.

Fire and trouble signals of fire alarm systems and sprinkler water-flow and supervisory signals of extinguishing systems shall be annunciated in an area designated as the facility control center which shall be constantly attended by staff personnel. All such signals shall produce both an audible signal and visual display at the facility control center indicating the building, floor zone or other designated area from which the signal originated in accordance with Section 907.6.3.

All local detention facilities within the scope of Section 6031.4 of the Penal Code shall have a automatic smoke detection system. A manual fire alarm-initiating device shall be installed in all guard control stations and shall be capable of alerting personnel in a central control point to the presence of fire or smoke within the facility.

**907.2.6.4. Large family day-care.** Every large family day-care home shall be provided with at least one manual device at a location approved by the authority having jurisdiction. Such device shall actuate a fire alarm signal, which shall be audible throughout the facility at a minimum level of 15 db above ambient noise level. These devices need not be interconnected to any other fire alarm device, have a control panel or be electrically supervised or provided with emergency power. Such device or devices shall be attached to the struc-

*ture and may be of any type acceptable to the enforcing agency, provided that such devices are distinctive in tone and are audible throughout the structure.*

**[F] 907.2.7 Group M.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M occupant load of all floors is 500 or more persons.
2. The Group M occupant load is more than 100 persons above or below the lowest level of exit discharge.

**Exceptions:**

1. A manual fire alarm system is not required in covered or open mall buildings complying with Section 402.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler waterflow.

**[F] 907.2.7.1 Occupant notification.** During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a waterflow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

**[F] 907.2.8 Group R-1.** Fire alarm systems and smoke alarms shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.3.

**[F] 907.2.8.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

**Exceptions:**

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required throughout the building when all of the following conditions are met:
  - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;

- 2.2. The notification appliances will activate upon sprinkler waterflow; and
- 2.3. At least one manual fire alarm box is installed at an approved location.

**[F] 907.2.8.2 Automatic smoke detection system.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior corridors serving sleeping units.

**Exception:** An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

**[F] 907.2.8.3 Smoke alarms.** Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**[F] 907.2.9 Group R-2 and R-2.1.** Fire alarm systems and smoke alarms shall be installed in Group R-2 and R-2.1 occupancies as required in Sections 907.2.9.1 and 907.2.9.4.

**[F] 907.2.9.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.
4. Congregate residences with more than 16 occupants.

**Exceptions:**

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler waterflow.

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3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1026.6, Exception 4.

**[F] 907.2.9.2 Smoke alarms.** Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**[F] 907.2.9.3 Group R-2 college and university buildings.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 college and university buildings in the following locations:

1. Common spaces outside of dwelling units and sleeping units.
2. Laundry rooms, mechanical equipment rooms, and storage rooms.
3. All interior corridors serving sleeping units or dwelling units.

Required smoke alarms in dwelling units and sleeping units in Group R-2 college and university buildings shall be interconnected with the fire alarm system in accordance with NFPA 72.

**Exception:** An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units or dwelling units and where each sleeping unit or dwelling unit either has a means of egress door opening directly to an exterior exit access that leads directly to an exit or a means of egress door opening directly to an exit.

**907.2.9.4 Licensed Group R-2.1 occupancies.** Licensed Group R-2.1 occupancies housing more than six nonambulatory, elderly clients shall be provided with an approved manual and automatic fire alarm system.

**Exceptions:** Buildings housing nonambulatory clients on the first story only and which are protected throughout by the following:

1. An approved and supervised automatic sprinkler system, as specified in Sections 903.3.1.1 or 903.3.1.2, which upon activation will initiate the fire alarm system to notify all occupants.
2. A manual fire alarm system.
3. Smoke alarms required by Section 907.2.11.

**907.2.9.4.1 Smoke alarms.** Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**[F] 907.2.10 Group R-4.** Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

**[F] 907.2.10.1 Manual fire alarm system.** A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 occupancies.

#### Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, egress court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
  - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;
  - 2.2. The notification appliances will activate upon sprinkler waterflow; and
  - 2.3. At least one manual fire alarm box is installed at an approved location.

3. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2.1 are not exceeded.

**[F] 907.2.10.2 Automatic smoke detection system.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

#### Exceptions:

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

**[F] 907.2.10.3 Smoke alarms.** Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

**[F] 907.2.11 Single- and multiple-station smoke alarms.** Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

**Exception:** For Group R occupancies. A fire alarm system with smoke detectors located in accordance with this section may be installed in lieu of smoke alarms. Upon actuation of the detector, only those notification appliances in the dwelling unit or guest room where the detector is actuated shall activate.

**[F] 907.2.11.1 Group R-1.** Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

See Section 907.2.11.4 for specific location requirements.

**[F] 907.2.11.2 Groups R-2, R-2.1, R-3, R-3.1 and R-4 and I-1.** Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-2.1, R-3, R-3.1 and R-4 regardless of occupant load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.

**Exception:** Single- or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.

3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

4. In a Group R-3.1 occupancies, in addition to the above, smoke alarms shall be provided throughout the habitable areas of the dwelling unit except kitchens.

See Section 907.2.11.4 for specific location requirements.

**907.2.11.2.1 Group I-4 occupancies.** Large family day-care homes shall be equipped with State Fire Marshal approved and listed single station residential type smoke alarms.

**907.2.11.2.2 Group R-3.1.** In all facilities housing a bedridden client, smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall be electrically interconnected so as to cause all smoke alarms to sound a distinctive alarm signal upon actuation of any single smoke alarm. Such alarm signal shall be audible throughout the facility at a minimal level of 15 db above ambient noise level. These devices need not be interconnected to any other fire alarm device, have a control panel, or be electrically supervised or provided with emergency power.

**907.2.11.2.3 Smoke alarms.** Smoke alarms shall be tested and maintained in accordance with the manufacturer's instructions. Smoke alarms that no longer function shall be replaced.

**907.2.11.3 Interconnection.** Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

**907.2.11.4 Power source.** In new construction and in newly classified Group R-3.1 occupancies, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

**Exception:** Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system.

#### **907.2.11.5 Specific location requirements.**

*Extract from NFPA 72 Section 29.8.3.4 Specific Location Requirements\*.*

*This extract has been provided by NFPA as amended by the Office of the State Fire Marshal and adopted by reference as follows:*

**29.8.3.4 Specific location requirements.** The installation of smoke alarms and smoke detectors shall comply with the following requirements:

- (1) *Smoke alarms and smoke detectors shall not be located where ambient conditions, including*

humidity and temperature, are outside the limits specified by the manufacturer's published instructions.

- (2) Smoke alarms and smoke detectors shall not be located within unfinished attics or garages or in other spaces where temperatures can fall below 40°F (4°C) or exceed 100°F (38°C).
- (3) Where the mounting surface could become considerably warmer or cooler than the room, such as a poorly insulated ceiling below an unfinished attic or an exterior wall, smoke alarms and smoke detectors shall be mounted on an inside wall.
- (4) Smoke alarms or smoke detectors shall be installed a minimum of 20 feet horizontal distance from a permanently installed cooking appliance.

**Exceptions:**

- (1) Ionization smoke alarms with an alarm-silencing switch or photoelectric smoke alarms shall be permitted to be installed 10 feet (3 m) or greater from a permanently installed cooking appliance.
- (2) Photoelectric smoke alarms shall be permitted to be installed greater than 6 feet (1.8 m) from a permanently installed cooking appliance where the kitchen or cooking area and adjacent spaces have no clear interior partitions and the 10 ft distances would prohibit the placement of a smoke alarm or smoke detector required by other sections of the code.
- (3) Smoke alarms listed for use in close proximity to a permanently installed cooking appliance.
- (5) Effective January 1, 2016, smoke alarms and smoke detectors used in household fire alarm systems installed between 6 ft (1.8 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be listed for resistance to common nuisance sources from cooking.
- (6) Installation near bathrooms. Smoke alarms shall be installed not less than a 3-foot (0.91 m) horizontal distance from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by other sections of the code.
- (7) Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from the supply registers of a forced air heating or cooling system and shall be installed outside of the direct airflow from those registers.
- (8) Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal

path from the tip of the blade of a ceiling-suspended (paddle) fan.

- (9) Where stairs lead to other occupied levels, a smoke alarm or smoke detector shall be located so that smoke rising in the stairway cannot be prevented from reaching the smoke alarm or smoke detector by an intervening door or obstruction.
- (10) For stairways leading up from a basement, smoke alarms or smoke detectors shall be located on the basement ceiling near the entry to the stairs.
- (11) For tray-shaped ceilings (coffered ceilings), smoke alarms and smoke detectors shall be installed on the highest portion of the ceiling or on the sloped portion of the ceiling within 12 in. (300 mm) vertically down from the highest point.
- (12) Smoke alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.7.3.2.4 of NFPA 72.
- (13) Heat alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.6.3 of NFPA 72.

\*For additional requirements or clarification see NFPA 72.

**[F] 907.2.11.3 Interconnection.** Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

**[F] 907.2.11.4 Power source.** In new construction, and in newly classified Group R-3.1 occupancies, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

**Exception:** Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system.

**907.2.11.6 Existing Group R Occupancies.** See the California Residential Code for existing Group R-3 occupancies or Chapter 11 of the California Fire Code for all other existing Group R occupancies.

**[F] 907.2.12 Special amusement buildings.** An automatic smoke detection system shall be provided in special

amusement buildings in accordance with Sections 907.2.12.1 through 907.2.12.3.

**[F] 907.2.12.1 Alarm.** Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.

**[F] 907.2.12.2 System response.** The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause illumination of the means of egress with light of not less than 1 footcandle (11 lux) at the walking surface level;
2. Stop any conflicting or confusing sounds and visual distractions;
3. Activate an approved directional exit marking that will become apparent in an emergency; and
4. Activate a prerecorded message, audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation.

**[F] 907.2.12.3 Emergency voice/alarm communication system.** An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire special amusement building.

**[F] 907.2.13 High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of the fire department vehicle access.** High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall be provided with an automatic smoke detection system in accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

#### Exceptions:

1. Airport traffic control towers in accordance with Sections 907.2.22 and 412.
2. Open parking garages in accordance with Section 406.5.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special occupancies in accordance with Section 503.1.1.
5. In Group I-2, I-2.1 and R-2.1 occupancies, the alarm shall sound at a constantly attended loca-

tion and occupant notification shall be broadcast by the emergency voice/alarm communication system.

**[F] 907.2.13.1 Automatic smoke detection.** Automatic smoke detection in high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall be in accordance with Sections 907.2.13.1.1 and 907.2.13.1.2.

**[F] 907.2.13.1.1 Area smoke detection.** Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall activate the emergency voice/alarm communication system in accordance with Section 907.5.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.10, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection.
2. In each elevator machine room and in elevator lobbies.

**[M] 907.2.13.1.2 Duct smoke detection.** Smoke detectors listed for use in air duct systems shall be provided in accordance with this section and the California Mechanical Code. The activation of any detector required by this section shall initiate a visible and audible supervisory signal at a constantly attended location. Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) ( $0.94 \text{ m}^3/\text{s}$ ). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
2. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm ( $2.4 \text{ m}^3/\text{s}$ ) and serving not more than 10 air-inlet openings.

**[F] 907.2.13.2 Fire department communication system.** Where a wired communication system is approved in lieu of an emergency responder radio coverage system in accordance with Section 510 of the California Fire Code, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 911, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed

exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.

**[F] 907.2.14 Atriums connecting more than two stories.**

A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories, with smoke detection installed throughout the atrium. The system shall be activated in accordance with Section 907.5. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.5.2.2.

**[F] 907.2.15 High-piled combustible storage areas.** An automatic smoke detection system shall be installed throughout high-piled combustible storage areas where required by Section 3206.5 of the *California Fire Code*.

**[F] 907.2.16 Aerosol storage uses.** Aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system where required by the *California Fire Code*.

**[F] 907.2.17 Lumber, wood structural panel and veneer mills.** Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

**[F] 907.2.18 Underground buildings with smoke control systems.** Where a smoke control system is installed in an underground building in accordance with this code, automatic smoke detectors shall be provided in accordance with Section 907.2.18.1.

**[F] 907.2.18.1 Smoke detectors.** A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m<sup>3</sup>/s) and serving not more than 10 air-inlet openings.

**[F] 907.2.18.2 Alarm required.** Activation of the smoke control system shall activate an audible alarm at a constantly attended location.

**[F] 907.2.19 Deep underground buildings.** Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

**[F] 907.2.20 Covered and open mall buildings.** Where the total floor area exceeds 50,000 square feet (4645 m<sup>2</sup>) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.5.2.2.

**[F] 907.2.21 Residential aircraft hangars.** A minimum of one single-station smoke alarm shall be installed within a residential aircraft hangar as defined in Chapter 2 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm which will be audible in all sleeping areas of the dwelling.

**[F] 907.2.22 Airport traffic control towers.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in airport control towers in all occupiable and equipment spaces.

**Exception:** Audible appliances shall not be installed within the control tower cab.

**[F] 907.2.23 Battery rooms.** An automatic smoke detection system shall be installed in areas containing stationary storage battery systems with a liquid capacity of more than 50 gallons (189 L).

**907.2.24 Motion picture and television production studio sound stages and approved production facilities.**

**907.2.24.1 Sound stages-solid-ceiling sets and platforms.** Where required by Chapter 48 of the *California Fire Code*, all interior solid-ceiling sets over 600 square feet (55.7 m<sup>2</sup>) in area, and platforms (when provided) over 600 square feet (55.7 m<sup>2</sup>) in area and which exceed 3 feet (914 mm) in height shall be protected by an approved heat detector system. Heat detectors shall be spaced 30 feet (9144 mm) on center or as required by the manufacturer's installation instructions. The fire alarm system shall be connected to an approved supervising station in accordance with Section 907.6.5 or a local alarm which will give an audible signal at a constantly attended location.

**907.2.24.2 Production locations-solid-ceiling sets and platforms.** Where required by Chapter 48 of the *California Fire Code* in buildings with existing fire protection systems and where production intends to construct solid-ceiling sets over 600 square feet (55.7 m<sup>2</sup>) in area, and platforms over 600 square feet (55.7 m<sup>2</sup>) in area and which exceed 3 feet (914 mm) in height shall be protected by an approved heat detector system. Heat detectors shall be spaced 30 feet (9144 mm) on center or as required by the manufacturer's installation instructions. The fire alarm system shall be connected to an approved supervising station in accordance with Section 907.6.5 or a local alarm which will give an audible signal at a constantly attended location.

**907.2.24.3 Fire alarm control units.** Fire alarm control units shall be California State Fire Marshal listed

and shall be utilized in accordance with their listing. Control units are permitted to be temporarily supported by sets, platforms or pedestals.

#### 907.2.24.4 Heat detectors.

**907.2.24.4.1** Heat detection required by this section shall be defined as a portable system as it is intended to be reinstalled when platforms or sets are changed.

**907.2.24.4.2** Heat detectors shall be secured to standard outlet boxes and are allowed to be temporarily supported by sets, platforms or pedestals.

**907.2.24.4.3** Heat detectors shall be provided for solid-ceiling sets and platforms where required by Sections 4805.3 and 4811.14.

#### 907.2.25 Group C occupancies (organized camps).

**907.2.25.1 General.** Every building and structure used or intended for sleeping purposes shall be provided with an automatic smoke-detection system.

##### Exceptions:

1. Buildings and structures in existence and in operation prior to January 1, 1985.
2. Tents, tent structures and buildings and structures that do not exceed 25 ft (7620 mm) in any lateral dimensions and where such building or structure is not more than one story.

**907.2.25.2 Camp fire alarm.** Every organized camp shall provide and maintain audible appliances, or devices suitable for sounding a fire alarm. Such audible appliances or devices may be of any type acceptable to the enforcing agency provided they are distinctive in tone from all other signaling devices or systems and shall be audible throughout the camp premises. When an automatic fire alarm system is provided, as required by Section 440.6.6 of the California Building Code, all audible appliances required by this section shall be of the same type as that used in the automatic system.

#### 907.2.26 Fixed guideway transits systems fire alarm and communication systems.

**907.2.26.1 General.** Every fixed guideway transit station shall be provided with an approved emergency voice/alarm communication system in accordance with NFPA 72. The emergency voice/alarm communication system, designed and installed so that damage to any one speaker will not render any paging zone of the system inoperative.

##### Exception: Open stations

**907.2.26.2 System components.** Each station fire alarm system shall consist of:

1. Fire alarm control unit at a location as permitted by the enforcing agency.
2. An alarm annunciator(s). The annunciator(s) shall be located at a point acceptable to the enforcing agency. The annunciator(s) shall indicate the type of device and general location of alarm. All alarm, supervisory and trouble signals

shall be transmitted to the local annunciator(s) and the operations control center.

3. Manual fire alarm boxes shall be provided throughout passenger platforms and stations.

**Exception:** Two-way emergency communication reporting devices (emergency telephones) are allowed to be used in lieu of manual fire alarm boxes as permitted by the enforcing agency. Such devices shall provide two-way communication between the operations control center and each device. Such devices shall be located as required for manual fire alarm boxes, and shall be distinctly identified by signs, coloring or other means acceptable to the enforcing agency.

4. Automatic smoke detectors in all ancillary spaces.

##### Exceptions:

1. Ancillary spaces protected by an approved fixed automatic extinguishing system; or
2. Ancillary spaces protected by quickresponse sprinklers.

5. Automatic control of exiting components.

**907.2.26.3 Emergency voice/alarm communication system.** Each station shall be provided with an emergency voice/alarm communication system capable of transmitting voice, recorded or electronically generated textual messages to all areas of the station. The system(s) shall be configured such that the messages can be initiated from either the Emergency Management Panel (EMP) or the operations control center.

**907.2.26.4 Emergency telephones.** A dedicated two-way emergency communication phone system designed and installed in accordance with NFPA 72 shall be provided in all underground stations to facilitate direct communications for emergency response between remote locations and the EMP.

**907.2.26.4.1** Remote emergency phones shall be located at ends of station platforms, each hose outlet connection and station valve rooms.

**907.2.26.4.2** Provisions shall be made in the design of this two-way emergency communication phone system for extensions of the system to the next passenger station or guideway portal.

**907.2.27 Winery caves.** An approved manual fire alarm system conforming to the provisions of Section 907.2 shall be provided in all Type 3 winery caves.

**907.2.28 Group L.** A manual fire alarm system shall be installed throughout buildings containing Group L occupancies. When Group L occupancies are located in mixed use buildings, at least one manual fire alarm shall be located in the Group L occupancy.

**907.2.28.1 Group L occupancies located above the 10th story.** Manual fire alarm boxes shall be required on each side of the 2-hour fire-smoke barrier and at each exit above the 10th story.

**907.2.29 Public school state funded construction projects for kindergarten through 12th grade - automatic fire alarm system requirements.**

**907.2.29.1 New public school campus.** An automatic fire alarm system shall be provided in all occupancies that activates the occupant notification system signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6. The provisions of this section shall apply to any public school project consisting of one or more buildings on a new school campus and receiving state funds pursuant to Leroy F. Greene School Facilities Act of 1998, California Education Code Sections 17070.10 through 17079. For purposes of this section, new campus refers to a school site, where an application for construction of original buildings was made to DSA on or after July 1, 2002.

**Exceptions:**

1. A relocatable building that is sited with the intent that it be at the site for less than three years and is sited upon a temporary foundation in a manner that is designed to permit easy removal. Also see CCR, Title 24, Part 1, California Administrative Code, Section 4-314 for definition of relocatable building.
2. Detached buildings designed and used for non-instructional purposes that meet the applicable requirements for that occupancy. Buildings would include, but not be limited to:

Concession stand  
Press box  
Restroom facilities  
Shade structure  
Snack bar  
Storage building  
Ticket booth

**907.2.29.2 New building on an existing public school campus.** An automatic fire alarm system shall be provided in all occupancies. The provisions of this section shall apply to any public school project construction of a new building on an existing campus and receiving state funds pursuant to Leroy F. Green, School Facilities Act of 1998, California Education Code Sections 17070.10 through 17079. For purposes of this section, an existing campus refers to a school site, where an application for construction of original buildings was made to DSA prior to July 1, 2002.

**Exceptions:**

1. A construction project that has an estimated total cost of less than \$200,000.
2. A relocatable building that is sited with the intent that it be at the site for less than three years and is sited upon a temporary foundation in a manner that is designed to permit easy removal. See California Administrative Code, Section 4-314 for definition of relocatable building.
3. Detached buildings designed and used for non-instructional purposes that meet the applicable requirements for that occupancy. Buildings would include, but not be limited to:

Concession stand  
Press box  
Restroom facilities

Shade structure  
Snack bar  
Storage building  
Ticket booth

**907.2.29.3 Alterations to existing buildings on an existing public school campus.** An automatic fire alarm system shall be provided for all portions within the scope of an alteration project. The provisions of this section shall apply to any public school project on an existing campus and receiving state funds pursuant to Leroy F. Green, School Facilities Act of 1998, California Education Code Sections 17070.10 through 17079. For purposes of this section, an existing campus refers to a school site, where an application for construction of original buildings was made to DSA prior to July 1, 2002.

**Exceptions:**

1. A construction project that has an estimated total cost of less than \$200,000.
2. A relocatable building that is sited with the intent that it be at the site for less than three years and is sited upon a temporary foundation in a manner that is designed to permit easy removal. See California Administrative Code, Section 4-314 for definition of relocatable building.
3. Detached buildings designed and used for non-instructional purposes that meet the applicable requirements for that occupancy. Buildings would include, but not be limited to:

Concession Stand  
Press Box  
Restroom Facilities  
Shade Structure  
Snack Bar  
Storage Building  
Ticket Booth

**907.2.29.4 Day-care, Group E or Group I-4 located on a public school campus.** An automatic fire alarm system shall be provided in all buildings used as or containing a Group E or Group I-4 day-care.

**[F] 907.3 Fire safety functions.** Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is installed. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a constantly attended location. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

**[F] 907.3.1 Duct smoke detectors.** Smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety

function in accordance with this code and the *California Mechanical Code*. Duct smoke detectors shall not be used as a substitute for required open area detection.

**Exceptions:**

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

**[F] 907.3.2 Delayed egress locks.** Where delayed egress locks or devices are installed on means of egress doors in accordance with Section 1008.1.9.7, an automatic smoke detection system shall be installed as required by that section and Section 1008.1.9.7.

**907.3.2.1** *In other than Groups I, R-2.1 and R-4 occupancies for single-story building, smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces. For multiple-story buildings, smoke detectors shall be installed throughout all occupied areas and mechanical/electrical spaces for the story where delayed egress devices are installed. Additional detectors are required on adjacent stories where occupants of those stories utilize the same means of egress.*

**Exception:** Refer to Section 907.3.2.4 for Group A courthouse occupancies.

**907.3.2.2 For Group I and R-2.1 occupancies.** Smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces of smoke-compartment where delayed egress devices are installed. Additional detectors are required in adjacent smoke-compartment where occupants of those compartments utilize the same means of egress.

**907.3.2.3 For Group R-4.** Occupancies licensed as residential care facilities for the elderly, and housing clients with Alzheimer's disease or dementia residential facilities, smoke detectors shall be installed at ceilings throughout all occupiable rooms and areas and mechanical/electrical rooms and spaces.

**907.3.2.4 For Group A Courthouse occupancies.** An approved automatic smoke detection system shall be installed at ceilings in all occupied corridors and mechanical/electrical spaces of smoke-compartment where delayed egress devices are installed.

**[F] 907.3.3 Elevator emergency operation.** Automatic fire detectors installed for elevator emergency operation shall be installed in accordance with the provisions of *California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders* and NFPA 72.

**[F] 907.3.4 Wiring.** The wiring to the auxiliary devices and equipment used to accomplish the above fire safety

functions shall be monitored for integrity in accordance with NFPA 72.

**[F] 907.4 Initiating devices.** Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

**[F] 907.4.1 Protection of fire alarm control unit.** In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station transmitting equipment.

**Exception:** Where ambient conditions prohibit installation of a smoke detector, a heat detector shall be permitted.

**[F] 907.4.2 Manual fire alarm boxes.** Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm boxes installed in accordance with Sections 907.4.2.1 through 907.4.2.6.

**[F] 907.4.2.1 Location.** Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960 mm).

**Exception:** When individual dwelling units are served by a single exit stairway, additional boxes at other than the ground floor may be omitted.

**[F] 907.4.2.2 Height.** The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) measured vertically, from the floor level to the activating handle or lever of the box. Manual fire alarm boxes shall also comply with Section 11B309.4.

**Exception:** [DSA-AC] In existing buildings there is no requirement to retroactively relocate existing manual fire alarm boxes to a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) from the floor level to the highest point of the activated handle or lever of the box. Manual fire alarm boxes shall also comply with 11B-309.4.

**[F] 907.4.2.3 Color.** Manual fire alarm boxes shall be red in color.

**[F] 907.4.2.4 Signs.** Where fire alarm systems are not monitored by a supervising station, an approved permanent sign shall be installed adjacent to each manual fire alarm box that reads: WHEN ALARM SOUNDS CALL FIRE DEPARTMENT.

**Exception:** Where the manufacturer has permanently provided this information on the manual fire alarm box.

**[F] 907.4.2.5 Protective covers.** The fire code official is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal

shall not be installed unless approved. Protective covers shall not project more than that permitted by Section 1003.3.3.

**[F] 907.4.2.6 Unobstructed and unobscured.** Manual fire alarm boxes shall be accessible, unobstructed, unobscured and visible at all times.

**907.4.2.7 Operation.** *Manual fire alarm boxes shall be operable with one hand including boxes with protective covers.*

**[F] 907.4.3 Automatic smoke detection.** Where an automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors cannot be utilized due to ambient conditions, approved automatic heat detectors shall be permitted.

**[F] 907.4.3.1 Automatic sprinkler system.** For conditions other than specific fire safety functions noted in Section 907.3, in areas where ambient conditions prohibit the installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 and that is connected to the fire alarm system shall be approved as automatic heat detection.

**[F] 907.5 Occupant notification systems.** A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.4. Where a fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors.
2. Automatic sprinkler system waterflow devices.
3. Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

**Exception:** Where notification systems are allowed elsewhere in Section 907 to annunciate at a constantly attended location.

**[F] 907.5.1 Presignal feature.** A presignal feature shall not be installed unless approved by the fire code official and the fire department. Where a presignal feature is provided, a signal shall be annunciated at a constantly attended location approved by the fire department, in order that occupant notification can be activated in the event of fire or other emergency.

**[F] 907.5.2 Alarm notification appliances.** Alarm notification appliances shall be provided and shall be listed for their purpose.

**[F] 907.5.2.1 Audible alarms.** Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm. *In Group I-2 occupancies, audible appliances located in patient areas shall be only chimes or similar sounding appliances for alerting staff. See Section 907.6.5.*

**Exceptions:**

1. Visible alarm notification appliances shall be allowed in lieu of audible alarm notification

appliances in *patient areas of Group I-2 occupancies.*

2. Where provided, audible notification appliances located in each occupant evacuation elevator lobby in accordance with Section 3008.10.1 shall be connected to a separate ||| notification zone for manual paging only.

**[F] 907.5.2.1.1 Average sound pressure.** The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupiable space within the building.

**[F] 907.5.2.1.2 Maximum sound pressure.** The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

**907.5.2.1.3 Audible alarm signal.** *The audible signal shall be the standard fire alarm evacuation signal, ANSI S3.41 Audible Emergency Evacuation Signal, "three pulse temporal pattern," as described in NFPA 72.*

**Exception:** *The use of the existing evacuation signaling scheme shall be permitted where approved by the enforcing agency.*

**[F] 907.5.2.2 Emergency voice/alarm communication systems.** Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404 of the *California Fire Code*. In high-rise buildings and *Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access*, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

**Exception:** *In Group I-2, I-2.1 and R-2.1 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.*

**[F] 907.5.2.2.1 Manual override.** A manual override for emergency voice communication shall be

provided on a selective and all-call basis for all paging zones.

**[F] 907.5.2.2.2 Live voice messages.** The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages by paging zones on a selective and all-call basis.

**[F] 907.5.2.2.3 Alternate uses.** The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm use takes precedence over any other use.

**[F] 907.5.2.2.4 Emergency voice/alarm communication captions.** Where stadiums, arenas and grandstands are required to caption audible public announcements in accordance with Section 1108.2.7.2, the emergency/voice alarm communication system shall also be captioned. Prerecorded or live emergency captions shall be from an approved location constantly attended by personnel trained to respond to an emergency.

**[F] 907.5.2.2.5 Emergency power.** Emergency voice/alarm communications systems shall be provided with an approved emergency power source.

**[F] 907.5.2.3 Visible alarms.** Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.5.

#### Exceptions:

1. *In other than Group I-2 and I-2.1*, visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in *enclosed exit stairways, exterior exit stairs and exterior exit ramps*.
3. Visible alarm notification appliances shall not be required in elevator cars.

**[F] 907.5.2.3.1 Public and common use areas.** Visible alarm notification appliances shall be provided in public use areas and common use areas, *including but not limited to*:

1. *Sanitary facilities including restrooms, bathrooms and shower rooms*
2. *Corridors*
3. *Music practice rooms*
4. *Band rooms*
5. *Gymnasiums*
6. *Multipurpose rooms*
7. *Occupational shops*
8. *Occupied rooms where ambient noise impairs hearing of the fire alarm*
9. *Lobbies*

#### 10. Meeting rooms

#### 11. Classrooms

**[F] 907.5.2.3.2 Employee work areas.** Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with a minimum of 20-percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing impaired employee(s).

**[F] 907.5.2.3.3 Groups R-1 and R-2.1.** Group R-1 and R-2.1 dwelling units or sleeping units in accordance with Table 907.5.2.3.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

**[F] TABLE 907.5.2.3.3  
VISIBLE ALARMS**

NUMBER OF SLEEP UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

*[SFM] Also see Chapter 11B, Section 11B 224.4 and Table 11B 224.4.*

**[F] 907.5.2.3.4 Group R-2.** In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with NFPA 72. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

**907.5.2.3.5 Groups R-2.1, R-3.1 and R-4.** Protective social care facilities which house persons who are hearing impaired, shall be provided with notification appliances for the hearing impaired installed in accordance with NFPA 72 and which shall activated upon initiation of the fire alarm system or the smoke alarms.

**907.5.2.4 Group E schools.** One audible alarm notification appliance shall be mounted on the exterior of a buildings to alert occupants at each playground area.

**907.5.2.5 Groups I-2 and I-2.1.** Audible appliances shall be used in nonpatient areas. Visible appliances are allowed to be used in lieu of audible appliances in patient occupied areas. Audible appliances located in patient areas shall be only chimes or similar sounding appliances for alerting staff.

In occupancies housing nonambulatory persons where restraint is practiced, staff and attendants shall be provided and housed or located in such a manner that such supervisory personnel will also be alerted upon activation of the fire alarm system or any detector required by this section.

**[F] 907.6 Installation.** A fire alarm system shall be installed in accordance with this section and NFPA 72.

**[F] 907.6.1 Wiring.** Wiring shall comply with the requirements of *California Electrical Code* and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

**907.6.1.1 High-rise buildings.** Wiring for fire alarm signaling line circuits, initiating circuits and notification circuits in high-rise buildings shall be in accordance with the following:

1. Class A in accordance with NFPA 72.

**Exception:** Initiating circuits which serve only a single initiating device.

2. Enclosed in continuous metallic raceways in accordance with the California Electrical Code.

**Exception:** Metallic cable (MC) shall be permitted for fire alarm notification circuits where continuous metallic raceways are not required for survivability.

**[F] 907.6.2 Power supply.** The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

**Exception:** Back-up power for single-station and multiple-station smoke alarms as required in Section 907.2.11.4.

**[F] 907.6.3 Zones.** Fire alarm systems shall be divided into zones where required by this section. For the purposes of annunciation and notification, zoning shall be in accordance with the following:

1. Where the fire-protective signaling system serves more than one building, each building shall be considered as a separate zone.
2. Each floor of a building shall be considered as a separate zone.
3. Each section of floor of a building that is separated by fire walls or by horizontal exits shall be considered as a separate zone.
4. Each zone shall not exceed 22,500 square feet (2090 m<sup>2</sup>). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

**Exception:** Automatic sprinkler system zones shall not exceed the area permitted by NFPA 13.

5. For Group I-3 occupancies each cell complex shall be considered a separate zone.
6. For Group H and L occupancies above the 10th story, each side of the 2-hour fire-smoke barrier shall be considered a separate zone.
7. Annunciation shall be further divided into zones where deemed necessary by the enforcing agency.

**907.6.3.1 Annunciation.** Alarm, supervisory and trouble signals shall be annunciated in the main control unit by means of an audible signal and a visual display in accordance with NFPA 72. Identification of the type of alarm and supervisory initiating devices, such as manual, automatic, sprinkler waterflow, sprinkler valve supervisory, fire-pump supervisory, etc., shall be separately indicated.

**Exception:** Group R-3 occupancies.

**[F] 907.6.3.1.1 Annunciator panel.** An annunciator panel complying with Section 907.6.3.1 and the associated controls shall be provided in an approved remote location where deemed necessary by the enforcing agency. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible-alarm silencing switch.

**[F] 907.6.3.2 High-rise buildings.** In high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for each of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler waterflow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

**907.6.3.3 High-rise buildings zoning annunciator panel.** In high-rise buildings, a zoning annunciator panel shall be provided in the Fire Command Center. This panel shall not be combined with the Firefighter Smoke Control Panel unless approved. Panel shall be in matrix format or an approved equivalent configuration. All indicators shall be based upon positive confirmation. The panel shall include the following features at a minimum:

1. Fire alarm initiating devices with individual annunciation per floor for manual fire alarm boxes, area smoke detectors, elevator lobby smoke detectors, duct smoke detectors, heat detectors, auxiliary alarms and sprinkler waterflow. (Red LED)
2. Sprinkler and standpipe system control valves per floor - supervisory. (Yellow LED)

3. Common fire alarm system trouble. (Yellow LED)
4. Annunciation Panel Power On. (Green LED)
5. Lamp test. (Push Button)

**907.6.3.4 Notification zoning.** Upon activation of initiating devices where occupant notification is required for evacuation, all notification zones shall operate simultaneously throughout the building.

**Exceptions:**

1. High-rise buildings as permitted in Section 907.2.13.
2. Hospitals and convalescent facilities with staff alerting notification appliances or emergency voice/alarm communication, zoning shall be in accordance with the approved fire plan.
3. Detention facilities.
4. Upon approval by the fire code official in buildings which are sprinklered throughout, specific notification zoning shall be permitted where the notification zones are separated by a minimum of a 2-hour fire barrier and 2-hour fire-resistive floor assembly. The system shall have the capability to activate all other notification zones by automatic and manual means.
5. Upon approval by the fire code official in buildings which are sprinklered throughout, specific notification zoning shall be permitted where the activated initiating device or fire extinguishing system is separated from any nonactive notification zones by a minimum of 300-ft horizontal distance. The system shall have the capability to activate all other notification zones by automatic and manual means.
6. Where a Group H or L occupancy is located above the 10th story, each side of the 2-hour fire-smoke barrier shall be considered a separate zone.

**[F] 907.6.4 Access.** Access shall be provided to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.

**[F] 907.6.5 Monitoring.** Fire alarm systems required by this chapter or by the *California Fire Code* shall be monitored by an approved supervising station in accordance with NFPA 72 and this section.

**Exception:** Monitoring by a supervising station is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.11.
2. Group I-3 occupancies shall be monitored in accordance with Section 907.2.6.3.
3. Automatic sprinkler systems in one- and two-family dwellings.

**[F] 907.6.5.1 Automatic telephone-dialing devices.** Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any fire department telephone number unless approved by the fire chief.

**[F] 907.6.5.2 Termination of monitoring service.** Termination of fire alarm monitoring services shall be in accordance with Section 901.9 of the *California Fire Code*.

**907.6.5.3 Group E schools.** Fire alarm systems shall transmit the alarm, supervisory and trouble signals to an approved supervising station in accordance with NFPA 72. The supervising station shall be listed as either UUFX (Central Station) or UUJS (remote & proprietary) by the Underwriters Laboratory Inc. (UL) or other approved listing and testing laboratory or shall comply with the requirements of standard, FM 3011.

**[F] 907.7 Acceptance tests and completion.** Upon completion of the installation, the fire alarm system and all fire alarm components shall be tested in accordance with NFPA 72.

**[F] 907.7.1 Single- and multiple-station alarm devices.** When the installation of the alarm devices is complete, each device and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the smoke alarm provisions of NFPA 72.

**[F] 907.7.2 Record of completion.** A record of completion in accordance with NFPA 72 verifying that the system has been installed and tested in accordance with the approved plans and specifications shall be provided.

**[F] 907.7.3 Instructions.** Operating, testing and maintenance instructions and record drawings ("as-builts") and equipment specifications shall be provided at an approved location.

**[F] 907.8 Inspection, testing and maintenance.** The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Section 907.8 of the *California Fire Code*.

## SECTION 908 EMERGENCY ALARM SYSTEMS

**[F] 908.1 Group H occupancies.** Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided in accordance with Section 414.7.

**[F] 908.2 Group H-5 occupancy.** Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 415.10.3.5. A continuous gas-detection system shall be provided for HPM gases in accordance with Section 415.10.7.

**[F] 908.3 Highly toxic and toxic materials.** A gas detection system shall be provided to detect the presence of highly toxic or toxic gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is pro-

vided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the immediately dangerous to life and health (IDLH) limit.

**Exception:** A gas-detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

**[F] 908.3.1 Alarms.** The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both visible and audible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

**Exception:** Signal transmission to a constantly attended control station is not required when not more than one cylinder of highly toxic or toxic gas is stored.

**[F] 908.3.2 Shutoff of gas supply.** The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

**Exception:** Automatic shutdown is not required for reactors utilized for the production of highly toxic or toxic compressed gases where such reactors are:

1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
2. Constantly attended.
3. Provided with readily accessible emergency shutoff valves.

**[F] 908.3.3 Valve closure.** The automatic closure of shutoff valves shall be in accordance with the following:

1. When the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.
3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

**Exception:** When the gas-detection sampling point initiating the gas-detection system alarm is at a use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close.

**[F] 908.4 Ozone gas-generator rooms.** Ozone gas-generator rooms shall be equipped with a continuous gas-detection system that will shut off the generator and sound a local alarm when concentrations above the PEL occur.

**[F] 908.5 Repair garages.** A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 406.8.5.

**[F] 908.6 Refrigerant detector.** Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification indicated in the *California Mechanical Code*. Detectors and alarms shall be placed in approved locations.

**[F] 908.7 Carbon monoxide alarms.** (See Section 420.6).

## SECTION 909 SMOKE CONTROL SYSTEMS

**[F] 909.1 Scope and purpose.** This section applies to mechanical or passive smoke control systems when they are required by other provisions of this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *California Mechanical Code*.

**[F] 909.2 General design requirements.** Buildings, structures or parts thereof required by this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

**[F] 909.3 Special inspection and test requirements.** In addition to the ordinary inspection and test requirements which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the construction documents shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particu-

lar testing involved. The special inspections and tests required by this section shall be conducted under the same terms in Section 1704.

**[F] 909.4 Analysis.** A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted construction documents and shall include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.6.

**[F] 909.4.1 Stack effect.** The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

**[F] 909.4.2 Temperature effect of fire.** Buoyancy and expansion caused by the design fire in accordance with Section 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

**[F] 909.4.3 Wind effect.** The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of Chapter 16.

**[F] 909.4.4 HVAC systems.** The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

**[F] 909.4.5 Climate.** The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

**[F] 909.4.6 Duration of operation.** All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

**[F] 909.5 Smoke barrier construction.** Smoke barriers shall comply with Section 709, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls  $A/A_w = 0.00100$
2. Interior exit stairways and ramps and exit passageways:  $A/A_w = 0.00035$
3. Enclosed exit access stairways and ramps and all other shafts:  $A/A_w = 0.00150$
4. Floors and roofs:  $A/A_F = 0.00050$

where:

$A$  = Total leakage area, square feet ( $m^2$ ).

$A_F$  = Unit floor or roof area of barrier, square feet ( $m^2$ ).

$A_w$  = Unit wall area of barrier, square feet ( $m^2$ ).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

**[F] 909.5.1 Leakage area.** The total leakage area of the barrier is the product of the smoke barrier gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke control systems tested using other approved means such as door fan testing shall be as approved by the fire code official.

**[F] 909.5.2 Opening protection.** Openings in smoke barriers shall be protected by *self-closing devices* or automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section 716.5.3.

#### Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with Section 907.3. *When used in Group I-2 or I-2.1, such detectors shall activate the fire alarm system.*
2. Fixed openings between smoke zones that are protected utilizing the airflow method *in other than Group I-2 or I-2.1.*
3. In Group I-2 or I-2.1, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion *or horizontal sliding doors that comply with Section 1008.1.4.3 shall be installed. Vision panels consisting of fire-rated glazing in approved frames shall be provided in each cross-corridor swinging door and at each cross-corridor horizontal-sliding door in a smoke barrier.* The doors shall be close-fitting within operational tolerances and shall not have undercuts, louvers or grilles. *Swinging doors shall have head and jamb stops, astragals or rabbits at meeting edges. Doors installed across corridors shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Positive-latching devices are not required. Doors installed across corridors shall comply with Section 1008.1.1.*
4. Group I-3.
5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.
6. *In Group I-2 or I-2.1, smoke damper activation may be accomplished by a fire alarm control unit provided that an open area smoke detection system is provided within all areas served by an HVAC system.*

**[F] 909.5.2.1 Ducts and air transfer openings.** Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121°C) smoke damper complying with Section 717.

**[F] 909.6 Pressurization method.** The primary mechanical means of controlling smoke shall be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

**[F] 909.6.1 Minimum pressure difference.** The minimum pressure difference across a smoke barrier shall be 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings.

In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences at least two times the maximum calculated pressure difference produced by the design fire.

**[F] 909.6.2 Maximum pressure difference.** The maximum air pressure difference across a smoke barrier shall be determined by required door-opening or closing forces. The actual force required to open exit doors when the system is in the smoke control mode shall be in accordance with Section 1008.1.3. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$$F = F_{dc} + K(WA\Delta P)/2(W-d) \quad (\text{Equation 9-1})$$

where:

$A$  = Door area, square feet ( $\text{m}^2$ ).

$d$  = Distance from door handle to latch edge of door, feet (m).

$F$  = Total door opening force, pounds (N).

$F_{dc}$  = Force required to overcome closing device, pounds (N)

$K$  = Coefficient 5.2 (1.0).

$W$  = Door width, feet (m).

$\Delta P$  = Design pressure difference, inches of water (Pa).

**[F] 909.7 Airflow design method.** When approved by the fire code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

**[F] 909.7.1 Velocity.** The minimum average velocity through a fixed opening shall not be less than:

$$v = 217.2[h(T_f - T_o)/(T_f + 460)]^{1/2} \quad (\text{Equation 9-2})$$

$$\text{For SI: } v = 119.9 [h (T_f - T_o)/T_f]^{1/2}$$

where:

$h$  = Height of opening, feet (m).

$T_f$  = Temperature of smoke, °F (K).

$T_o$  = Temperature of ambient air, °F (K).

$v$  = Air velocity, feet per minute (m/minute).

**[F] 909.7.2 Prohibited conditions.** This method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with exiting. In no case shall airflow toward the fire exceed 200 feet per minute (1.02 m/s). Where the formula in Section 909.7.1 requires airflow to exceed this limit, the airflow method shall not be used.

**[F] 909.8 Exhaust method.** When approved by the fire code official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92.

**[F] 909.8.1 Smoke layer.** The height of the lowest horizontal surface of the smoke layer interface shall be maintained at least 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.

**[F] 909.9 Design fire.** The design fire shall be based on a rational analysis performed by the registered design professional and approved by the fire code official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

**[F] 909.9.1 Factors considered.** The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and whether the fire is likely to be steady or unsteady.

**[F] 909.9.2 Design fire fuel.** Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

**[F] 909.9.3 Heat-release assumptions.** The analysis shall make use of best available data from approved sources and shall not be based on excessively stringent limitations of combustible material.

**[F] 909.9.4 Sprinkler effectiveness assumptions.** A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

**[F] 909.10 Equipment.** Equipment including, but not limited to, fans, ducts, automatic dampers and balance dampers, shall be suitable for its intended use, suitable for the probable exposure temperatures that the rational analysis indicates and as approved by the fire code official.

**[F] 909.10.1 Exhaust fans.** Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by:

$$T_s = (Q_c/mc) + (T_a) \quad (\text{Equation 9-3})$$

where:

$c$  = Specific heat of smoke at smoke layer temperature, Btu/lb°F (kJ/kg • K).

$m$  = Exhaust rate, pounds per second (kg/s).

$Q_c$  = Convective heat output of fire, Btu/s (kW).

$T_a$  = Ambient temperature, °F (K).

$T_s$  = Smoke temperature, °F (K).

**Exception:** Reduced  $T_s$  as calculated based on the assurance of adequate dilution air.

**[F] 909.10.2 Ducts.** Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *California Mechanical Code*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

**Exception:** Flexible connections (for the purpose of vibration isolation) complying with the *California Mechanical Code*, that are constructed of approved fire-resistance-rated materials.

**[F] 909.10.3 Equipment, inlets and outlets.** Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

**[F] 909.10.4 Automatic dampers.** Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved, recognized standards.

**[F] 909.10.5 Fans.** In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts), as determined from measurement of actual current draw, and shall have a minimum service factor of 1.15.

**[F] 909.11 Power systems.** The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power systems. Secondary power shall be from an approved standby source complying with Chapter 27 of this code. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The transfer to full

standby power shall be automatic and within 60 seconds of failure of the primary power.

**[F] 909.11.1 Power sources and power surges.** Elements of the smoke control system relying on volatile memories or the like shall be supplied with uninterruptable power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke control system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

**[F] 909.12 Detection and control systems.** Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override, the presence of power downstream of all disconnects and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

*The status of dampers shall be determined using limit or proximity switches installed at the damper or incorporated into the damper actuator. Where multiple dampers are grouped together in an assembly requiring one or more actuators, each damper shall be independently controlled by a separate actuator and provided with an individual limit or proximity switch, or the dampers shall be linked together by a reliable and durable mechanical or otherwise permanent means into one or more groups, with each group provided with a common limit or proximity switch.*

*The status of fans shall be determined by sensing the air flow downstream of the fans using pressure differential switches or transmitters, or by other means of positive proof of air flow where approved by the enforcing authority.*

**[F] 909.12.1 Wiring.** In addition to meeting requirements of *California Electrical Code*, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

**[F] 909.12.2 Activation.** Smoke control systems shall be activated in accordance with this section.

**[F] 909.12.2.1 Pressurization, airflow or exhaust method.** Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

**[F] 909.12.2.2 Passive method.** Passive smoke control systems actuated by approved spot-type detectors listed for releasing service shall be permitted.

**[F] 909.12.3 Automatic control.** Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1, manual controls that are readily accessible to the fire department and any smoke detectors required by engineering analysis.

**[F] 909.13 Control air tubing.** Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

**[F] 909.13.1 Materials.** Control-air tubing shall be hard-drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type in accordance with ASME B 16.18 or ASME B16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP-5 brazing alloy with solidus above 1,100°F (593°C) and liquids below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only.

**Exception:** Nonmetallic tubing used within control panels and at the final connection to devices provided all of the following conditions are met:

1. Tubing shall comply with the requirements of *Section 602.2.1.3* of the *California Mechanical Code*.
2. Tubing and connected devices shall be completely enclosed within a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No.22 gage). Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

**[F] 909.13.2 Isolation from other functions.** Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

**[F] 909.13.3 Testing.** Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

**[F] 909.14 Marking and identification.** The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

**[F] 909.15 Control diagrams.** Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the fire code official, the fire department and in the fire command center in a format and manner approved by the fire chief.

**[F] 909.16 Fire-fighter's smoke control panel.** A fire-fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a fire command center complying with Section 911 in high-rise buildings. *Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access or buildings with smoke-protected assembly seating.* In all other buildings, the fire-fighter's smoke control panel shall be installed in an approved location adjacent to the fire alarm control panel. The fire-fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3.

**[F] 909.16.1 Smoke control systems.** Fans within the building shall be shown on the fire-fighter's control panel. A clear indication of the direction of airflow and the relationship of components shall be displayed. Status indicators shall be provided for all smoke control equipment, annunciated by fan and zone, and by pilot-lamp-type indicators as follows:

1. Fans, dampers and other operating equipment in their normal status—WHITE.
2. Fans, dampers and other operating equipment in their off or closed status—RED.
3. Fans, dampers and other operating equipment in their on or open status—GREEN.
4. Fans, dampers and other operating equipment in a fault status—YELLOW/AMBER.

**[F] 909.16.2 Smoke control panel.** The fire-fighter's control panel shall provide control capability over the complete smoke-control system equipment within the building as follows:

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can also be controlled from other sources within the building. This includes stairway pressurization fans; smoke exhaust fans; supply, return and exhaust fans; elevator shaft fans and other operating equipment used or intended for smoke control purposes.
2. OPEN-AUTO-CLOSE control over individual dampers relating to smoke control and that are also controlled from other sources within the building.
3. ON-OFF or OPEN-CLOSE control over smoke control and other critical equipment associated with a fire or smoke emergency and that can only be controlled from the fire-fighter's control panel.

**Exceptions:**

1. Complex systems, where approved, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit.
2. Complex systems, where approved, where the control is accomplished by computer interface using approved, plain English commands.

**[F] 909.16.3 Control action and priorities.** The fire-fighter's control panel actions shall be as follows:

1. ON-OFF and OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter's control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freezestats, duct smoke detectors, high-temperature cut-outs, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the fire-fighter's control panel. The last control action as indicated by each fire-fighter's control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

**Exception:** Power disconnects required by *California Electrical Code*.

2. Only the AUTO position of each three-position fire-fighter's control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire-fighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

**[F] 909.17 System response time.** Smoke-control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. For purposes of smoke control, the fire-fighter's control panel response time shall be the same for automatic or manual smoke control action initiated from any other building control point. The total response time, including that necessary for detection, shutdown of operating equipment and smoke control system startup, shall allow for full operational mode to be achieved before the conditions in the space exceed the design smoke condition. The system response time for each component and their sequential relationships shall be detailed in the required rational analysis and verification of their installed condition reported in the required final report.

**[F] 909.18 Acceptance testing.** Devices, equipment, components and sequences shall be individually tested. These tests, in addition to those required by other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.

**[F] 909.18.1 Detection devices.** Smoke or fire detectors that are a part of a smoke control system shall be tested in accordance with Chapter 9 in their installed condition. When applicable, this testing shall include verification of airflow in both minimum and maximum conditions.

**[F] 909.18.2 Ducts.** Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

**[F] 909.18.3 Dampers.** Dampers shall be tested for function in their installed condition.

**[F] 909.18.4 Inlets and outlets.** Inlets and outlets shall be read using generally accepted practices to determine air quantities.

**[F] 909.18.5 Fans.** Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute (rpm) and belt tension shall be made.

**[F] 909.18.6 Smoke barriers.** Measurements using inclined manometers or other approved calibrated measuring devices shall be made of the pressure differences across smoke barriers. Such measurements shall be conducted for each possible smoke control condition.

**[F] 909.18.7 Controls.** Each smoke zone equipped with an automatic-initiation device shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system, including verification of override from the fire-fighter's control panel and simulation of standby power conditions.

**[F] 909.18.8 Special inspections for smoke control.** Smoke control systems shall be tested by a special inspector.

**[F] 909.18.8.1 Scope of testing.** Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

**[F] 909.18.8.2 Qualifications.** Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

**[F] 909.18.8.3 Reports.** A complete report of testing shall be prepared by the special inspector or special inspection agency. The report shall include identification of all devices by manufacturer, nameplate data, design values, measured values and identification tag or mark. The report shall be reviewed by the responsible registered design professional and, when satisfied that the design intent has been achieved, the responsible registered design professional shall seal, sign and date the report.

**[F] 909.18.8.3.1 Report filing.** A copy of the final report shall be filed with the fire code official and an identical copy shall be maintained in an approved location at the building.

**[F] 909.18.9 Identification and documentation.** Charts, drawings and other documents identifying and locating each component of the smoke control system, and describing its proper function and maintenance requirements, shall be maintained on file at the building as an attachment to the report required by Section 909.18.8.3. Devices shall have an approved identifying tag or mark on them consistent with the other required documentation and shall be dated indicating the last time they were successfully tested and by whom.

*An approved operations manual describing the complete operations of the smoke control system and functioning of the firefighters smoke control panel shall be maintained at the fire command center.*

**[F] 909.19 System acceptance.** Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system and a written maintenance program complying with the requirements of Section 909.20.1 of the *California Fire Code* has been submitted and approved by the fire code official.

**Exception:** In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

**909.20 Smokeproof enclosures.** Where required by Section 1022.10, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an enclosed interior exit stairway that conforms to Section 1022.2 and an open exterior balcony or vestibule meeting the requirements of this section. Where access to the roof is required by the *California Fire Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

**909.20.1 Access.** Access to the stair shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the width of the corridor leading to the vestibule calculated in accordance with Section 1005.1, but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

**909.20.2 Construction.** The smokeproof enclosure shall be separated from the remainder of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Openings are not permitted other than the required means of egress doors. The

vestibule shall be separated from the stairway by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the fire-resistance rating requirements for floor assemblies.

**909.20.2.1 Door closers.** Doors in a smokeproof enclosure shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.5.9.3 and shall be installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

**909.20.2.2 Vestibule doors.** Where access to the stairway is by way of a vestibule, the door assembly from the building into the vestibule shall be a 90-minute fire door assembly complying with Section 715.4.4. The door assembly from the vestibule to the stairway shall have not less than a 20-minute fire protection rating and shall comply with the requirements for a smoke door assembly in accordance with Section 715.4.3. The door shall be installed in accordance with NFPA-105.

**909.20.2.3 Standpipes.** Where access to the stairway is by way of a vestibule, Fire department standpipe connections and valves serving the floor shall be within the vestibule unless otherwise approved by the fire code official. Standpipe connections in vestibules shall be located in such a manner so as not to obstruct egress where hose lines are connected and charged.

**909.20.2.4 Pressure differences.** The minimum pressure differences within the vestibule with the doors closed shall be 0.05-inch water gage (12.44 Pa) positive pressure relative to the fire floor and 0.05-inch water gage (12.44 Pa) negative pressure relative to the exit enclosure. No pressure difference is required relative to a nonfire floor.

**909.20.2.5 Relief vent.** A relief vent capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be located in the upper portion of such pressurized exit enclosures.

**Exception:** When approved by the enforcing agency, other engineered design methods capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be permitted.

**909.20.3 Natural ventilation alternative.** The provisions of Sections 909.20.3.1 and 909.20.3.3 shall apply to ventilation of smokeproof enclosures by natural means.

**909.20.3.1 Balcony doors.** Where access to the stairway is by way of an open exterior balcony, the door assembly into the enclosure shall be a fire door assembly in accordance with Section 716.5.

**909.20.3.2 Vestibule ventilation.** Where access to the stairway is by way of a vestibule, each vestibule shall

have a minimum net area of 16 square feet ( $1.5 \text{ m}^2$ ) of opening in a wall facing an outer court, yard or public way that is at least 20 feet (6096 mm) in width.

**909.20.4 Mechanical pressurization alternative.** The provisions of Sections 909.20.4.1 through 909.20.5.3 shall apply to ventilation to *pressurization* enclosures by mechanical means.

**909.20.4.1 Pressure differences.** *The pressurization system shall be designed so that the minimum pressure differences provided within the vestibule with the doors closed shall be 0.05-inch water gage (12.44 Pa) positive pressure relative to the fire floor and 0.05-inch water gage (12.44 Pa) negative pressure relative to the exit enclosure. No pressure difference is required relative to a nonfire floor.*

**909.20.4.2 Relief vent.** *A relief vent capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be located in the upper portion of such pressurized exit stairway enclosures.*

**Exception:** When approved by the enforcing agency, other engineered design methods capable of discharging a minimum of 2,500 cubic feet per minute (1180 L/s) of air at the design pressure difference shall be permitted.

**909.20.4.3 Pressurization equipment.** The activation of pressurization equipment required Section 909.20.4 shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure *and upon activation of the automatic controls required by Section 909.12.3*. When the closing device for the stair shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

**909.20.4.3.1 Pressurization systems.** Smokeproof enclosure *pressurization* systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

horizontal assemblies constructed in accordance with Section 711, or both.

3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

#### Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.

**909.20.4.3.2 Standby power.** *Pressurization* and stair shaft ventilation systems and automatic fire detection systems shall be powered by an approved standby power system conforming to Section 403.4.8 and Chapter 27.

**909.20.4.3.3 Acceptance and testing.** Before the mechanical equipment is approved, the system shall be tested in the presence of the building official to confirm that the system is operating in compliance with these requirements.

**909.20.5 Pressurization equipment.** The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure. When the closing device for the stair shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

**909.20.5.1 Pressurizing systems.** Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**Exceptions:**

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.

**909.20.5.2 Standby power.** *Pressurization* and stair shaft ventilation systems and automatic fire detection systems shall be powered by an approved standby power system conforming to Section 403.4.8 and Chapter 27.

**909.20.5.3 Acceptance and testing.** Before the mechanical equipment is approved, the system shall be tested in the presence of the building official to confirm that the system is operating in compliance with these requirements.

**909.20.6 Ventilating equipment.** The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an approved location at the entrance to the smokeproof enclosure. When the closing device for the stair shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

**909.20.6.1 Ventilation systems.** Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building,

including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**Exceptions:**

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.

**909.20.6.2 Standby power.** Mechanical vestibule and stair shaft ventilation systems and automatic fire detection systems shall be powered by an approved standby power system conforming to Section 403.4.8 and Chapter 27.

**909.20.6.3 Acceptance and testing.** Before the mechanical equipment is approved, the system shall be tested in the presence of the building official to confirm that the system is operating in compliance with these requirements.

**909.21 Elevator hoistway pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with Sections 909.21.1 through 909.21.11.

**909.21.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

**909.21.2 Rational analysis.** A rational analysis complying with Section 909.4 shall be submitted with the construction documents.

**909.21.3 Ducts for system.** Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

**909.21.4 Fan system.** The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through 909.21.4.4.

**909.21.4.1 Fire resistance.** When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

**909.21.4.2 Smoke detection.** The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

**909.21.4.3 Separate systems.** A separate fan system shall be used for each elevator hoistway.

**909.21.4.4 Fan capacity.** The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (0.4719 m<sup>3</sup>/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.

**909.21.5 Standby power.** The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

**909.21.6 Activation of pressurization system.** The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

**909.21.7 Special inspection.** Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

**909.21.8 Marking and identification.** Detection and control systems shall be marked in accordance with Section 909.14.

**909.21.9 Control diagrams.** Control diagrams shall be provided in accordance with Section 909.15.

**909.21.10 Control panel.** A control panel complying with Section 909.16 shall be provided.

**909.21.11 System response time.** Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

## SECTION 910 SMOKE AND HEAT REMOVAL

**[F] 910.1 General.** Where required by this code, smoke and heat vents, or mechanical smoke removal systems shall conform to the requirements of this section.

**[F] 910.2 Where required.** Smoke and heat vents or mechanical smoke removal systems shall be installed as required by Sections 910.2.1 and 910.2.2.

### Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.
2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, smoke and heat removal shall not be required within these areas.

**910.2.1 Group F-1 or S-1.** Smoke and heat vents installed in accordance with Section 910.3 or a mechanical smoke

removal system installed in accordance with Section 910.4 shall be installed in buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m<sup>2</sup>) of undivided area. In occupied portions of a building where the upper surface of the story is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

**Exception:** Group F-1 aircraft manufacturing buildings and Group S-1 aircraft repair hangars.

**[F] 910.2.2 High-piled combustible storage.** Smoke and heat removal required by Table 3206.2 of the California Fire Code, for buildings and portions thereof containing high-piled combustible storage shall be installed in accordance with Section 910.3 in unsprinklered buildings. In buildings and portions thereof containing high-piled combustible storage equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 a smoke and heat removal system shall be installed in accordance with Section 910.3 or 910.4. In occupied portions of a building where the upper surface of the story is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

**[F] 910.3 Smoke and heat vents.** The design and installation of smoke and heat vents shall be in accordance with Sections 910.3.1 through 910.3.3.

**[F] 910.3.1 Listing and labeling.** Smoke and heat vents shall be listed and labeled to indicate compliance with FM 4430, ICC ES AC 331, or UL 793.

**[F] 910.3.2 Smoke and vent locations.** Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, sprinkler location and structural members.

**910.3.3 Smoke and heat vents area.** The required aggregate area of smoke and heat vents shall be calculated as follows:

For buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1:

$$A_{VR} = V/9000 \quad (\text{Equation 9-4})$$

Where:

$A_{VR}$  = the required aggregate vent area (ft<sup>2</sup>)

$V$  = volume (ft<sup>3</sup>) of the area that requires smoke removal

For unsprinklered buildings:

$$A_{VR} = A_{FA}/50 \quad (\text{Equation 9-5})$$

Where:

$A_{VR}$  = the required aggregate vent area (ft<sup>2</sup>)

$A_{FA}$  = the area of the floor of the area that requires smoke removal.

**[F] 910.4 Mechanical smoke removal systems.** Engineered mechanical smoke removal systems shall be designed and installed in accordance with Sections 910.4.1 through 910.4.7.

**910.4.1 Automatic sprinklers required.** The building shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

**910.4.2 Exhaust fan construction.** Exhaust fans that are part of a mechanical smoke removal system shall be rated for operation at 221°F (105°C). Exhaust fan motors shall be located outside of the exhaust fan air stream.

**910.4.3 System design criteria.** The mechanical smoke removal system shall be sized to exhaust the building at a minimum rate of two air changes per hour based upon the volume of the building or portion thereof without contents. The capacity of each exhaust fan shall not exceed 30,000 cubic feet per minute.

**910.4.3.1 Makeup air.** Makeup air openings shall be provided within six feet (add metric) of the floor level. Operation of makeup air openings shall be manual or automatic. The minimum gross area of makeup air inlets shall be 8 ft<sup>2</sup> per 1000 cfm of smoke exhaust.

**910.4.4 Activation.** The mechanical smoke removal system shall be activated by manual controls only.

**910.4.5 Manual control location.** Manual controls shall be located so as to be accessible to the fire service from an exterior door of the building and be protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 707 of the California Building Code or horizontal assemblies constructed in accordance with Section 712 of the California Building Code, or both.

**[F] 910.4.6 Control wiring.** Wiring for operation and control of mechanical smoke removal systems shall be connected ahead of the main disconnect in accordance with Section 701.12E of California Electrical Code and be and protected against interior fire exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes.

**[F] 910.4.7 Controls.** Where building air handling and mechanical smoke removal systems are combined or where independent building air-handling systems are provided, fans shall automatically shut down in accordance with the California Mechanical Code. The manual controls provided for the smoke removal system shall have the capability to override the automatic shutdown of fans that are part of the smoke removal system.

## SECTION 911 FIRE COMMAND CENTER

**[F] 911.1 General.** Where required by other sections of this code and in all buildings classified as high-rise buildings by

this code and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access, a fire command center for fire department operations shall be provided and shall comply with Sections 911.1.1 through 911.1.5.

**[F] 911.1.1 Location and access.** The location and accessibility of the fire command center shall be approved by the fire chief.

**[F] 911.1.2 Separation.** The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 707 or horizontal assembly constructed in accordance with Section 711, or both.

**[F] 911.1.3 Size.** The room shall be a minimum of 200 square feet (19 m<sup>2</sup>) with a minimum dimension of 10 feet (3048 mm).

**[F] 911.1.4 Layout approval.** A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation.

**[F] 911.1.5 Required features.** The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire alarm system zoning annunciator panel required by Section 907.6.3.3.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.

- 13. An approved Building Information Card that contains, but is not limited to, the following information:
    - 13.1. General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), estimated building population (i.e., day, night, weekend);
    - 13.2. Building emergency contact information that includes: a list of the building's emergency contacts (e.g., building manager, building engineer, etc.) and their respective work phone number, cell phone number, e-mail address;
    - 13.3. Building construction information that includes: the type of building construction (e.g., floors, walls, columns, and roof assembly);
    - 13.4. Exit stair information that includes: number of exit stairs in building, each exit stair designation and floors served, location where each exit stair discharges, exit stairs that are pressurized, exit stairs provided with emergency lighting, each exit stair that allows reentry, exit stairs providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, location of sky lobby, location of freight elevator banks;
    - 13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service;
    - 13.6. Fire protection system information that includes: locations of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of sprinkler systems installed (e.g., dry, wet, pre-action, etc.); and
    - 13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.
  - 14. Work table.
  - 15. Generator supervision devices, manual start and transfer features.
  - 16. Public address system, where specifically required by other sections of this code.
  - 17. Elevator fire recall switch in accordance with *California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders*.
  - 18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
  - 19. A master switch for unlocking elevator lobby doors permitted by Section 1008.1.9.12.
- ||
- [SFM] Fire command centers shall not be used for the housing of any boiler, heating unit, generator, combustible storage, or similar hazardous equipment or storage.*

**911.1.6 Ventilation.** The fire command center shall be provided with an independent ventilation or air-conditioning system.

## SECTION 912 FIRE DEPARTMENT CONNECTIONS

**[F] 912.1 Installation.** Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.5.

**[F] 912.2 Location.** With respect to hydrants, driveways, buildings and landscaping, fire department connections shall

be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire chief.

**[F] 912.2.1 Visible location.** Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire chief.

**[F] 912.2.2 Existing buildings.** On existing buildings, wherever the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an approved sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" at least 6 inches (152 mm) high and words in letters at least 2 inches (51 mm) high or an arrow to indicate the location. All such signs shall be subject to the approval of the fire code official.

**[F] 912.3 Access.** Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object. Access to fire department connections shall be approved by the fire chief.

**Exceptions:**

1. Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 and a means of emergency operation. The gate and the means of emergency operation shall be approved by the fire chief and maintained operational at all times.

2. When acceptable to the fire authority having jurisdiction, fire department connections for Group I-3 detention facilities may be located inside all security walls or fences on the property.

**[F] 912.3.1 Locking fire department connection caps.** The fire code official is authorized to require locking caps on fire department connections for water-based fire protection systems where the responding fire department carries appropriate key wrenches for removal.

**[F] 912.3.2 Clear space around connections.** A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or approved by the fire chief.

**[F] 912.3.3 Physical protection.** Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312 of the *California Fire Code*.

**[F] 912.4 Signs.** A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

**[P] 912.5 Backflow protection.** The potable water supply to automatic sprinkler and standpipe systems shall be protected

against backflow as required by the *Health and Safety Code Section 13114.7.*

## SECTION 913 FIRE PUMPS

**[F] 913.1 General.** Where provided, fire pumps shall be installed in accordance with this section and NFPA 20.

**[F] 913.2 Protection against interruption of service.** The fire pump, driver and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

**913.2.1 Protection of fire pump rooms.** Fire pumps shall be located in rooms that are separated from all other areas of the building by 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

### Exceptions:

1. In other than high-rise buildings, separation by 1-hour fire barriers constructed in accordance with Section 707 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both, shall be permitted in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Separation is not required for fire pumps physically separated in accordance with NFPA 20.

**[F] 913.3 Temperature of pump room.** Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

**[F] 913.3.1 Engine manufacturer's recommendation.** Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

**[F] 913.4 Valve supervision.** Where provided, the fire pump suction, discharge and bypass valves, and isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods:

1. Central-station, proprietary or remote-station signaling service.
2. Local signaling service that will cause the sounding of an audible signal at a constantly attended location.
3. Locking valves open.
4. Sealing of valves and approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner.

**[F] 913.4.1 Test outlet valve supervision.** Fire pump test outlet valves shall be supervised in the closed position.

**[F] 913.5 Acceptance test.** Acceptance testing shall be done in accordance with the requirements of NFPA 20.

**913.6 Fire pumps in high-rise buildings.** Engine-driven fire pumps and electric drive fire pumps supplied by generators shall both be provided with an on-premises fuel supply, sufficient for not less than 8-hour full-demand operation at 100 percent of the rated pump capacity in addition to all other required supply demands in accordance with Sections 9.6 and 11.4.2 of NFPA 20 and this section. (Also see Section 604.2.14.1.1 of the California Fire Code.)

## SECTION 914 EMERGENCY RESPONDER SAFETY FEATURES

**[F] 914.1 Shaftway markings.** Vertical shafts shall be identified as required by Sections 914.1.1 and 914.1.2.

**[F] 914.1.1 Exterior access to shaftways.** Outside openings accessible to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word "SHAFTWAY" in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

**[F] 914.1.2 Interior access to shaftways.** Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word "SHAFTWAY" in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

**Exception:** Markings shall not be required on shaftway openings that are readily discernible as openings onto a shaftway by the construction or arrangement.

**[F] 914.2 Equipment room identification.** Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

## SECTION 915 EMERGENCY RESPONDER RADIO COVERAGE

**[F] 915.1 General.** Emergency responder radio coverage shall be provided in all new buildings in accordance with Section 510 of the *California Fire Code*.



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE CHAPTER 10 – MEANS OF EGRESS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X												
Adopt entire chapter as amended (amended sections listed below)		X	X	X	X					X	X	X								
Adopt only those sections that are listed below						X														
Chapter / Section																				
1001.3		X																		
1001.4		X																		
1002.1		X																		
Accessible Means of Egress							X													
Area of Refuge								X												
Exit									X											
Guard (or Guardrail)			X	X	X	X														
Handrail									X											
Public Way									X											
Stair									X											
Stairway									X											
1003.1, not SFM exception									X											
1003.1		X	X	X	X															
1003.1.1										X		X								
1003.1.2											X									
1003.2		X	X	X	X															
1003.3																				
1003.3 Exc.		X																		
1003.3.3.1		X																		
1003.3.4			X	X	X															
1003.5		X	X	X	X															
Table 1004.1.1		X																		
1004.1.1.1		X																		
1004.1.1.2		X																		
1004.1.2.3		X																		
1005.1		X																		
1005.3		X																		
1005.3.1		X																		
1005.3.2		X																		
1005.7.1		X																		
1006.1		X																		
1007.1		X	X	X	X	X														
1007.2			X	X	X	X														
1007.2.1									X											
1007.3			X	X	X	X														
1007.4		X							X											
1007.5				X	X	X	X	X												

*(continued)*

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 10 – MEANS OF EGRESS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X												
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X			X	X	X									
Adopt only those sections that are listed below						X														
Chapter / Section																				
1007.5.1							X													
1007.6								X												
1007.6.1			X	X	X	X	X													
1007.6.2								X												
1007.6.3		X				X														
1007.7								X												
1007.7.1									X											
1007.7.2									X											
1007.7.3									X											
1007.7.4									X											
1007.7.5									X											
1007.7.6									X											
1007.8			X	X	X	X	X													
1007.8.1		X	X	X	X	X	X													
1007.8.1.1			X	X	X	X	X													
1007.8.2		X					X													
1007.9			X	X	X	X	X													
1007.10									X											
1007.11										X										
1007.12		X	X	X	X	X	X													
1008 (1st paragraph below title only)								X												
1008.1.1		X	X	X	X	X														
1008.1.1.1		X																		
1008.1.2		X																		
1008.1.4.1			X	X	X	X														
1008.1.4.4		X																		
1008.1.5			X	X	X	X														
1008.1.7			X	X	X															
1008.1.8			X	X	X															
1008.1.9.1		X	X	X	X															
1008.1.9.6		X																		
1008.1.9.7		X																		
1008.1.9.7 (Item 5.1 only)		X				X														
1008.1.9.8		X																		
1008.1.9.10		X																		
1008.1.9.12		X																		
1008.1.10		X																		
1008.1.11		X																		
1009 (1st paragraph below title only)							X													
1009.3		X																		
1009.4		X																		
1009.7.2 [DSA-AC: exc. 6 only]		X	X	X	X	X	X													

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 10 – MEANS OF EGRESS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X												
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X				X	X	X								
Adopt only those sections that are listed below							X													
Chapter / Section																				
1009.8		X																		
1009.15 (2nd paragraph only)		X					X													
1010 (1st paragraph below title only)							X													
1010.1				X	X	X														
1010.7.3				X	X	X														
1010.7.4				X	X	X														
1010.7.5				X	X	X														
1010.10				X	X	X														
1011.1		X																		
1011.2		X																		
1011.4		X	X	X	X	X														
1011.7		X																		
1011.8		X																		
1012 (1st paragraph below title only)							X													
1012.8		X																		
1013.2								X												
1013.3			X	X	X	X	X	X												
1013.4		X																		
1014.2		X																		
1014.2.2		X																		
1014.3		X																		
1015.1		X																		
Table 1015.1		X																		
1015.2		X																		
1015.2.2		X																		
1015.5		X																		
1015.6		X																		
1015.7		X																		
Table 1016.1		X																		
Table 1016.2		X																		
1016.2.2		X																		
1017 (1st paragraph below title only)								X												
1017.2 Exc. only									X											
1017.3 Exc. only									X											
1018.1		X																		
Table 1018.1		X																		
Table 1018.2		X																		
1018.4		X																		

(continued)

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 10 – MEANS OF EGRESS—continued**

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X						X	X												
Adopt entire chapter as amended (amended sections listed below)			X	X	X	X				X	X	X								
Adopt only those sections that are listed below						X														
Chapter / Section																				
1018.5		X							X	X	X									
1018.5, Exception 5									X	X	X									
1018.5.1		X																		
1018.6		X																		
1021.1		X																		
Table 1021.1		X																		
1021.2		X																		
Table 1021.2(1)		X																		
Table 1021.2(2)		X																		
1021.2		X																		
1021.2.1		X																		
1021.2.2		X																		
1021.3		X																		
1022.2		X																		
1022.9			X	X	X	X														
1022.9 (2nd paragraph only)							X													
1022.9.1		X																		
1022.10		X																		
1022.10.1		X																		
1022.10.2		X																		
1023.2		X																		
1025.4		X																		
1026.2		X																		
1027.1		X																		
1027.5		X																		
1028.1		X																		
1028.2		X																		
1028.3		X																		
1028.3.1		X																		
1028.6.1		X																		
1028.6.4		X																		
1028.9.1		X																		
1028.10		X																		
1029.1		X																		
1029.4		X																		

# CHAPTER 10

## MEANS OF EGRESS

### SECTION 1001 ADMINISTRATION

**1001.1 General.** Buildings or portions thereof shall be provided with a means of egress system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof.

**1001.2 Minimum requirements.** It shall be unlawful to alter a building or structure in a manner that will reduce the number of exits or the capacity of the means of egress to less than required by this code.

[F] **1001.3 Maintenance.** Means of egress shall be maintained in accordance with the *California Fire Code*.

[F] **1001.4 Fire safety and evacuation plans.** Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the *California Fire Code*. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the *California Fire Code*.

### SECTION 1002 DEFINITIONS

**1002.1 Definitions.** The following terms are defined in Chapter 2:

**ACCESSIBLE MEANS OF EGRESS.**

**AISLE.**

**AISLE ACCESSWAY.**

**ALTERNATING TREAD DEVICE.**

**AREA OF REFUGE.**

**BLEACHERS.**

**COMMON PATH OF EGRESS TRAVEL.**

**CORRIDOR.**

**DOOR, BALANCED.**

**EGRESS COURT.**

**EMERGENCY ESCAPE AND RESCUE OPENING.**

**EXIT.**

**EXIT ACCESS.**

**EXIT ACCESS DOORWAY.**

**EXIT ACCESS RAMP.**

**EXIT ACCESS STAIRWAY.**

**EXIT DISCHARGE.**

**EXIT DISCHARGE, LEVEL OF.**

**EXIT, HORIZONTAL.**

**EXIT PASSAGEWAY.**

**FIRE EXIT HARDWARE.**

**FIXED SEATING.**

**FLIGHT.**

**FLOOR AREA, GROSS.**

**FLOOR AREA, NET.**

**FOLDING AND TELESCOPIC SEATING.**

**GRANDSTAND.**

**GUARD ([DSA-AC, HCD 1 & HCD 2] or GUARDRAIL).**

**HANDRAIL.**

**INTERIOR EXIT RAMP.**

**INTERIOR EXIT STAIRWAY.**

**MEANS OF EGRESS.**

**MERCHANDISE PAD.**

**NOSING.**

**OCCUPANT LOAD.**

**PANIC HARDWARE.**

**PHOTOLUMINESCENT.**

**PUBLIC WAY.**

**RAMP.**

**SCISSOR STAIR.**

**SELF-LUMINOUS.**

**SMOKE-PROTECTED ASSEMBLY SEATING.**

**STAIR.**

**STAIRWAY.**

**STAIRWAY, EXTERIOR.**

**STAIRWAY, INTERIOR.**

**STAIRWAY, SPIRAL.**

**WINDER.**

### SECTION 1003 GENERAL MEANS OF EGRESS

**1003.1 Applicability.** The general requirements specified in Sections 1003 through 1013 shall apply to all three elements of the means of egress system, in addition to those specific requirements for the exit access, the exit and the exit discharge detailed elsewhere in this chapter.

*(DSA-AC & HCD 1-AC) In addition to the requirement of this chapter, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.8.2.1.2 regulated by the Department of Housing and Community Development, or Section 1.9.1 regulated by the Division of*

*the State Architect-Access Compliance, shall also comply with Chapter 11A or Chapter 11B, as applicable.*

**Exception:** Exiting requirements for Fixed Guideway Transit Systems shall be as per Section 433.3.

**1003.1.1 Means of egress for hospitals, skilled nursing facilities and intermediate care facilities and correctional treatment centers. [OSHPD 1 & 4] See Section 3417A.**

**1003.1.1 Means or egress for single-story light frame skilled nursing facilities and intermediate care facilities. [OSHPD 2] See Section 3424.**

**1003.2 Ceiling height.** The means of egress shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

**Exceptions:**

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of dwelling units and sleeping units within residential occupancies in accordance with Section 1208.2.
3. Allowable projections in accordance with Section 1003.3.
4. Stair headroom in accordance with Section 1009.5.
5. Door height in accordance with Section 1008.1.1.
6. Ramp headroom in accordance with Section 1010.6.2.
7. The clear height of floor levels in vehicular and pedestrian traffic areas in parking garages in accordance with Section 406.4.1. **(DSA-AC & HCD 1-AC)** *The clear height of vehicle and pedestrian areas required to be accessible, or identified as accessible, shall comply with Chapter 11A or Chapter 11B, as applicable.*
8. Areas above and below mezzanine floors in accordance with Section 505.2.
9. *In Group I-2, I-2.1 and I-3 occupancies, the means of egress shall have a ceiling height of not less than 8 feet (2439 mm).*

**1003.3 Protruding objects.** Protruding objects shall comply with the requirements of Sections 1003.3.1 through 1003.3.4.

**Exception:** *In Group I-2 and Group I-2.1 occupancies, protruding objects shall not extend more than 12 inches (305 mm) below the minimum ceiling height required by Section 1003.2.*

**1003.3.1 Headroom.** Protruding objects are permitted to extend below the minimum ceiling height required by Section 1003.2 provided a minimum headroom of 80 inches (2032 mm) shall be provided for any walking surface, including walks, corridors, aisles and passageways. Not more than 50 percent of the ceiling area of a means of egress shall be reduced in height by protruding objects.

**Exception:** Door closers and stops shall not reduce headroom to less than 78 inches (1981 mm).

A barrier shall be provided where the vertical clearance is less than 80 inches (2032 mm) high. The leading edge of such a barrier shall be located 27 inches (686 mm) maximum above the floor.

**1003.3.2 Post-mounted objects.** A free-standing object mounted on a post or pylon shall not overhang that post or pylon more than 4 inches (102 mm) where the lowest point of the leading edge is more than 27 inches (686 mm) and less than 80 inches (2032 mm) above the walking surface. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (686 mm) maximum or 80 inches (2032 mm) minimum above the finished floor or ground.

**Exception:** These requirements shall not apply to sloping portions of handrails between the top and bottom riser of stairs and above the ramp run.

**1003.3.3 Horizontal projections.** Structural elements, fixtures or furnishings shall not project horizontally from either side more than 4 inches (102 mm) over any walking surface between the heights of 27 inches (686 mm) and 80 inches (2032 mm) above the walking surface.

**Exception:** Handrails are permitted to protrude  $4\frac{1}{2}$  inches (114 mm) from the wall.

**1003.3.3.1 Horizontal projections for Group I-2 and I-2.1 occupancies.** Structural elements, fixtures or furnishings shall not project horizontally from either side more than  $1\frac{1}{2}$  inches (38 mm) into the required width of an exit access corridor serving any area caring for one or more nonambulatory or bedridden persons.

**Exceptions:**

1. Handrails are permitted to protrude  $3\frac{1}{2}$  inches (89 mm) from the wall.
2. Alcohol-based hand-rub dispensers are permitted to protrude 4 inches.
3. Manual fire alarm boxes with a protective cover installed are permitted to protrude 4 inches.

**1003.3.4 Clear width.** Protruding objects shall not reduce the minimum clear width of accessible routes as required in Chapter 11A or Chapter 11B.

**1003.4 Floor surface.** Walking surfaces of the means of egress shall have a slip-resistant surface and be securely attached.

**1003.5 Elevation change.** Where changes in elevation of less than 12 inches (305 mm) exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), ramps complying with Section 1010 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

**Exceptions:**

1. A single step with a maximum riser height of 7 inches (178 mm) is permitted for buildings with occupancies in Groups F, H, R-2, R-3, S and U at exterior doors not required to be accessible by Chapter 11A or 11B.

2. A stair with a single riser or with two risers and a tread is permitted at locations not required to be accessible by Chapter 11A or 11B, provided that the risers and treads comply with Section 1009.7, the minimum depth of the tread is 13 inches (330 mm) and at least one handrail complying with Section 1012 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the stair.
3. A step is permitted in aisles serving seating that has a difference in elevation less than 12 inches (305 mm) at locations not required to be accessible by Chapter 11A or 11B, provided that the risers and treads comply with Section 1028.11 and the aisle is provided with a handrail complying with Section 1028.13.

Throughout a story in a Group I-2 and Group I-2.1 occupancies, any change in elevation in portions of the means of egress that serve nonambulatory persons shall be by means of a ramp or sloped walkway.

**1003.6 Means of egress continuity.** The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component as specified in this chapter. Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter. The required capacity of a means of egress system shall not be diminished along the path of egress travel.

**1003.7 Elevators, escalators and moving walks.** Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

**Exception:** Elevators used as an accessible means of egress in accordance with Section 1007.4.

## SECTION 1004 OCCUPANT LOAD

**1004.1 Design occupant load.** In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be determined in accordance with this section.

**1004.1.1 Cumulative occupant loads.** Where the path of egress travel includes intervening rooms, areas or spaces, cumulative occupant loads shall be determined in accordance with this section.

**1004.1.1.1 Intervening spaces or accessory areas.** Where occupants egress from one or more rooms, areas or spaces through others, the design occupant load shall be the combined occupant load of interconnected accessory or intervening spaces. Design of egress path capacity shall be based on the cumulative portion of occupant loads of all rooms, areas or spaces to that point along the path of egress travel.

**1004.1.1.2 Adjacent levels for mezzanines.** That portion of occupant load of a mezzanine with all required egress through a room, area or space on an adjacent

level shall be added to the occupant load of that room, area or space.

**1004.1.1.3 Adjacent stories.** Other than for the egress components designed for convergence in accordance with Section 1005.6, the occupant load from separate stories shall not be added.

**1004.1.2 Areas without fixed seating.** The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.2. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant load factor assigned to the function of the space as set forth in Table 1004.1.2. Where an intended function is not listed in Table 1004.1.2, the building official shall establish a function based on a listed function that most nearly resembles the intended function.

**Exception:** Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

**1004.2 Increased occupant load.** The occupant load permitted in any building, or portion thereof, is permitted to be increased from that number established for the occupancies in Table 1004.1.2, provided that all other requirements of the code are also met based on such modified number and the *occupant load* does not exceed one occupant per 7 square feet ( $0.65 \text{ m}^2$ ) of occupiable floor space. Where required by the building official, an approved aisle, seating or fixed equipment diagram substantiating any increase in occupant load shall be submitted. Where required by the building official, such diagram shall be posted.

**1004.3 Posting of occupant load.** Every room or space that is an assembly occupancy shall have the occupant load of the room or space posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

**1004.4 Fixed seating.** For areas having fixed seats and aisles, the occupant load shall be determined by the number of fixed seats installed therein. The occupant load for areas in which fixed seating is not installed, such as waiting spaces, shall be determined in accordance with Section 1004.1.2 and added to the number of fixed seats.

The occupant load of wheelchair spaces and the associated companion seat shall be based on one occupant for each wheelchair space and one occupant for the associated companion seat provided in accordance with Section 1108.2.3.

For areas having fixed seating without dividing arms, the occupant load shall not be less than the number of seats based on one person for each 18 inches (457 mm) of seating length.

The occupant load of seating booths shall be based on one person for each 24 inches (610 mm) of booth seat length measured at the backrest of the seating booth.

## MEANS OF EGRESS

**1004.5 Outdoor areas.** Yards, patios, courts and similar outdoor areas accessible to and usable by the building occupants shall be provided with means of egress as required by this chapter. The occupant load of such outdoor areas shall be assigned by the building official in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the path of egress travel from the outdoor areas passes through the building, means of egress requirements for the building shall be based on the sum of the occupant loads of the building plus the outdoor areas.

### Exceptions:

1. Outdoor areas used exclusively for service of the building need only have one means of egress.
2. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

**1004.6 Multiple occupancies.** Where a building contains two or more occupancies, the means of egress requirements shall apply to each portion of the building based on the occupancy of that space. Where two or more occupancies utilize portions of the same means of egress system, those egress components shall meet the more stringent requirements of all occupancies that are served.

## SECTION 1005 MEANS OF EGRESS SIZING

**1005.1 General.** All portions of the means of egress system shall be sized in accordance with this section.

**Exception:** Means of egress complying with Section 1028.

**1005.2 Minimum width based on component.** The minimum width, in inches (mm), of any means of egress components shall not be less than that specified for such component, elsewhere in this code.

**1005.3 Required capacity based on occupant load.** The required capacity, in inches (mm), of the means of egress for any room, area, space or story shall not be less than that determined in accordance with Sections 1005.3.1 and 1005.3.2:

**1005.3.1 Stairways.** The capacity, in inches (mm), of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inch (7.6 mm) per occupant. Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.

### Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches (mm), of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.2 inch (5.1 mm) per occupant in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an emergency

TABLE 1004.1.2  
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR <sup>a</sup>
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit Gallery and Museum	30 net
Assembly with fixed seats	See Section 1004.4
Assembly without fixed seats	
Concentrated (chairs only not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms—other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
Group H 5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Laboratory	
Educational	50 net
Laboratories, non educational	100 net
Laboratory suite <sup>b</sup>	200 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Locker rooms	50 gross
Mall buildings –covered and open	See Section 402.8.2
Mercantile	
Areas on other floors	60 gross
Basement and grade floor areas	30 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

For SI: 1 square foot = 0.0929 m<sup>2</sup>.

a. Floor area in square feet per occupant.

b. See Section 443.2.

voice/alarm communication system in accordance with Section 907.5.2.2.

2. For Group H-1, H-2, H-3 and H-4 occupancies the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.7 inches (7.62 mm) per occupant.
3. Means of egress complying with Section 1028.

**1005.3.2 Other egress components.** The capacity, in inches (mm), of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inch (5.1 mm) per occupant.

**Exceptions:**

1. For other than Group H and I-2 occupancies, the capacity, in inches (mm), of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.15 inch (3.8 mm) per occupant in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.
2. For Group H-1, H-2, H-3 and H-4 occupancies the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.4 inches (5.08 mm) per occupant.
3. Means of egress complying with Section 1028.

**1005.4 Continuity.** The capacity of the means of egress required from any story of a building shall not be reduced along the path of egress travel until arrival at the public way.

**1005.5. Distribution of egress capacity.** Where more than one exit, or access to more than one exit, is required, the means of egress shall be configured such that the loss of any one exit, or access to one exit, shall not reduce the available capacity to less than 50 percent of the required capacity.

**1005.6 Egress convergence.** Where the means of egress from stories above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the required capacities for the two adjacent stories.

**1005.7 Encroachment.** Encroachments into the required means of egress width shall be in accordance with the provisions of this section.

**1005.7.1 Doors.** Doors, when fully opened, shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half.

**Exceptions:**

1. In other than Group I-2 occupancies, surface-mounted latch release hardware shall be exempt

from inclusion in the 7-inch maximum (178 mm) encroachment where:

- 1.1. The hardware is mounted to the side of the door facing away from the adjacent wall where the door is in the open position; and
- 1.2. The hardware is mounted not less than 34 inches (865 mm) nor more than 48 inches (1219 mm) above the finished floor.
2. The restrictions on door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 occupancies and dwelling units of Group R-3 occupancies.

**1005.7.2 Other projections.** Handrail projections shall be in accordance with the provisions of Section 1012.8. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.

**1005.7.3 Protruding objects.** Protruding objects shall comply with the applicable requirements of Section 1003.3.

## SECTION 1006 MEANS OF EGRESS ILLUMINATION

**1006.1 Illumination required.** The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.

**Exceptions:**

1. Occupancies in Group U.
2. Aisle accessways in Group A.
3. Dwelling units and sleeping units in Groups R-1, R-2 and R-3.
4. Sleeping units of Group I, R-2.1 and R-4 occupancies.

**1006.2 Illumination level.** The means of egress illumination level shall not be less than 1 footcandle (11 lux) at the walking surface.

**Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances to not less than 0.2 footcandle (2.15 lux), provided that the required illumination is automatically restored upon activation of a premises' fire alarm system where such system is provided.

**1006.3 Emergency power for illumination.** The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.

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2. Corridors, interior exit stairways and ramps and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

**1006.3.1 Illumination level under emergency power.** Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 footcandle (11 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

## SECTION 1007 ACCESSIBLE MEANS OF EGRESS

**1007.1 Accessible means of egress required.** Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by accessible means of egress *in at least the same number as required by Section 1015.1 or 1021.1. In addition to the requirements of this chapter, means of egress, which provide access to, or egress from, buildings for persons with disabilities, shall also comply with the requirements of Chapter 11A or 11B as applicable.*

### Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5, and Chapter 11A or 11B, as applicable.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8, and Chapter 11A or 11B, as applicable.

**1007.2 Continuity and components.** Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with *Chapter 11A, Sections 1110A.1 and 1120A, or Chapter 11B, Sections 11B-206 and 11B-402, as applicable.*
2. Interior exit stairways complying with *Sections 1007.3 and 1022, and Chapter 11A, Section 1123A, or Chapter 11B, Sections 11B-210 and 11B-504, as applicable.*
3. Interior exit access stairways complying with *Sections 1007.3 and 1009.3, Chapter 11A, Section 1123A, or Chapter 11B, Sections 11B-210 and 11B-504, as applicable.*
4. Exterior exit stairways complying with *Sections 1007.3 and 1026 and serving levels other than the level of exit discharge, and Chapter 11A, Section 1115A, or Chapter 11B, Sections 11B-210 and 11B-504, as applicable.*
5. Elevators complying with *Section 1007.4, and Chapter 11A, Section 1124A, or Chapter 11B, Sections 11B-206.6 and 11B-407, as applicable.*
6. Platform lifts complying with *Section 1007.5 and Chapter 11A, Section 1124A, or Chapter 11B, Sections 11B-206.7, 11B-207.2 and 11B-410 as applicable.*
7. Horizontal exits complying with Section 1025.
8. Ramps complying with *Section 1010, and Chapter 11A, Sections 1114A and 1122A, or Chapter 11B, 11B-405, as applicable.*
9. Areas of refuge complying with Section 1007.6.
10. Exterior area for assisted rescue complying with Section 1007.7.

**1007.2.1 Elevators required.** In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.4.

### Exceptions:

1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1010.

**1007.3 Stairways.** In order to be considered part of an accessible means of egress, a stairway between stories shall have a clear width of 48 inches (1219 mm) minimum between hand-

rails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit. Exit access stairways that connect levels in the same story are not permitted as part of an accessible means of egress. **[DSA-AC & HCD 1-AC]** In addition, exit stairways shall comply with Chapter 11A, Sections 1115A and 1123A, or Chapter 11B, Sections 11B-210 and 11B-504, as applicable.

**Exceptions:**

1. The clear width of 48 inches (1219 mm) between handrails is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Areas of refuge are not required at stairways in buildings equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. The clear width of 48 inches (1219 mm) between handrails is not required for stairways accessed from a horizontal exit.
4. Areas of refuge are not required at stairways serving open parking garages.
5. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
6. The areas of refuge are not required in Group R-2 occupancies.

**1007.4 Elevators.** In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of *California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders*. Standby power shall be provided in accordance with Chapter 27 and Section 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

**Exceptions:**

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Elevators not required to be located in a shaft in accordance with Section 712 are not required to be accessed from an area of refuge or horizontal exit.
4. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.

**1007.5 Platform lifts.** Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in *Chapter 11A, Sections 1121A and 1124A.11, or Chapter 11B, Sections*

*11B-206.7.1 through 11B-206.7.10, as applicable*. Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a means of egress.

**[DSA-AC]** See Chapter 11B, Section 11B-207.2 for additional accessible means of egress requirements at platform lifts.

**1007.5.1 Openness.** Platform lifts on an accessible means of egress shall not be installed in a fully enclosed hoistway.

**1007.6 Areas of refuge.** Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway complying with Sections 1007.3 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.10 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier. **[DSA-AC]** Areas of refuge shall comply with the requirements of this code and shall adjoin an accessible route complying with Sections 11B-206 and 11B-402.

**1007.6.1 Size.** Each area of refuge shall be sized to accommodate two wheelchair spaces that are not less than 30 inches by 48 inches (762 mm by 1219 mm). The total number of such 30-inch by 48-inch (762 mm by 1219 mm) spaces per story shall be not less than one for every 200 persons of calculated occupant load served by the area of refuge. Such wheelchair spaces shall not reduce the required means of egress width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

**Exception:** The enforcing agency may reduce the size of each required area of refuge to accommodate one wheelchair space that is not less than 30 inches by 48 inches (762 mm by 1219 mm) on floors where the occupant load is less than 200.

**1007.6.2 Separation.** Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 709 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

**Exception:** Areas of refuge located within an enclosure for exit access stairways or interior exit stairways.

**1007.6.3 Two-way communication.** Areas of refuge shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

**1007.7 Exterior area for assisted rescue.** Exterior areas for assisted rescue shall be accessed by an accessible route from the area served. Exterior areas for assisted rescue shall be permitted in accordance with Section 1007.7.1 or 1007.7.2.

**1007.7.1 Level of exit discharge.** Where the exit discharge does not include an accessible route from an exit located on a level of exit discharge to a public way, an exterior area of assisted rescue shall be provided on the

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exterior landing in accordance with Sections 1007.7.3 through 1007.7.6.

**1007.7.2 Outdoor facilities.** Where exit access from the area serving outdoor facilities is essentially open to the outside, an exterior area of assisted rescue is permitted as an alternative to an area of refuge. Every required exterior area of assisted rescue shall have direct access to an interior exit stairway, exterior stairway, or elevator serving as an accessible means of egress component. The exterior area of assisted rescue shall comply with Sections 1007.7.3 through 1007.7.6 and shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

**1007.7.3 Size.** Each exterior area for assisted rescue shall be sized to accommodate wheelchair spaces in accordance with Section 1007.6.1.

**1007.7.4 Separation.** Exterior walls separating the exterior area of assisted rescue from the interior of the building shall have a minimum fire-resistance rating of 1 hour, rated for exposure to fire from the inside. The fire-resistance-rated exterior wall construction shall extend horizontally 10 feet (3048 mm) beyond the landing on either side of the landing or equivalent fire-resistance-rated construction is permitted to extend out perpendicular to the exterior wall 4 feet (1219 mm) minimum on the side of the landing. The fire-resistance-rated construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower. Openings within such fire-resistance-rated exterior walls shall be protected in accordance with Section 716.

**1007.7.5 Openness.** The exterior area for assisted rescue shall be open to the outside air. The sides other than the separation walls shall be at least 50 percent open, and the open area shall be distributed so as to minimize the accumulation of smoke or toxic gases.

**1007.7.6 Stairway.** Stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

**Exception:** The clear width of 48 inches (1219 mm) between handrails is not required at stairways serving buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

**1007.8 Two-way communication.** A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

### Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.

2. Two-way communication systems are not required on floors provided with ramps conforming to the provisions of Section 1010.

**1007.8.1 System requirements.** Two-way communication systems shall provide communication between each required location *and* a central control point location approved by the fire department. Where the central control point is not constantly attended, a two-way communication system shall have a timed automatic telephone dial-out capability to *an approved* monitoring location. The two-way communication system shall include both audible and visible signals.

**1007.8.1.1 Visible communication method. [DSA-AC and HCD 1-AC]** A button complying with Section 1138A.4 or Sections 11B-205 and 11B-309 in the area of refuge shall activate both a light in the area of refuge indicating that rescue has been requested and a light at the central control point indicating that rescue is being requested. A button at the central control point shall activate both a light at the central control point and a light in the area of refuge indicating that the request has been received.

**1007.8.2 Directions.** Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the *specific story, floor location and building address or other building identifier* shall be posted adjacent to the two-way communication system.

**1007.9 Signage.** Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with Chapter 11A, Section 1143A and Chapter 11B, Section 11B-703.5 as applicable, requirements for visual characters and include the International Symbol of Accessibility complying with Chapter 11B, Section 11B-703.7.2.1. Where exit sign illumination is required by Section 1011.3, the signs shall be illuminated. Additionally, raised character and Braille signage complying with Chapter 11A, Section 1143A and Chapter 11B, Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5, and the International Symbol of Accessibility complying with Chapter 11B, Section 11B-703.7.2.1, shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.4.

**1007.10 Directional signage.** Direction signage complying with Chapter 11B, Section 11B-703.5 indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.

2. At elevator landings.
3. Within areas of refuge.

**1007.11 Instructions.** In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following *and shall comply with Chapter 11B, Section 11B-703.5:*

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communications system where provided.

**1007.12 Alarms/emergency warning systems/accessibility.** If emergency warning systems are required, they shall activate a means of warning the hearing impaired. Emergency warning systems as part of the fire-alarm system shall be designed and installed in accordance with NFPA 72 as amended in Chapter 35.

## SECTION 1008 DOORS, GATES AND TURNSTILES

[*DSA-AC*] In addition to the requirements of this section, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.9.1 regulated by the Division of the State Architect—Access Compliance, shall also comply with Chapter 11A or Chapter 11B, Sections 11B-206.5 and 11B-404, as applicable.

**1008.1 Doors.** Means of egress doors shall meet the requirements of this section. Doors serving a means of egress system shall meet the requirements of this section and Section 1020.2. Doors provided for egress purposes in numbers greater than required by this code shall meet the requirements of this section.

Means of egress doors shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.

**1008.1.1 Size of doors.** The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches (813 mm). Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in a Group I-2 or I-2.1 occupancy used for the movement of beds and litter patients shall provide a clear width not less

than 44 inches (1054 mm). The height of door openings shall not be less than 80 inches (2032 mm).

### Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in Group R-2 and R-3 occupancies.
2. Door openings to resident sleeping units in Group I-3 occupancies shall have a clear width of not less than 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet ( $0.93\text{ m}^2$ ) in area shall not be limited by the minimum width.
4. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
5. Door openings within a dwelling unit or sleeping unit shall not be less than 78 inches (1981 mm) in height.
6. Exterior door openings in dwelling units and sleeping units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
7. In other than Group R-1 occupancies, the minimum widths shall not apply to interior egress doors within a dwelling unit or sleeping unit that is not required to be *adaptable or accessible as specified in Chapter 11A*.

**1008.1.1.1 Projections into clear width.** There shall not be projections into the required clear width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

### Exceptions:

1. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.
2. In a Group I-2 or I-2.1 occupancy, there shall be no projections into the clear width of doors used for the movement of beds and litter patients in the means of egress.

**1008.1.2 Door swing.** Egress doors shall be of the pivoted or side-hinged swinging type.

### Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.

6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.
10. *In I-2 and I-2.1 occupancies, exit doors serving an occupant load of 10 or more, may be of the pivoted or balanced type.*

Doors shall swing in the direction of egress travel where serving a room or area containing an occupant load of 50 or more persons or a Group H occupancy. *For Group L occupancies, see Section 443.6.2.*

*In a Group I-2 occupancy, all required exterior egress doors shall open in the direction of egress regardless of the occupant load served.*

**1008.1.3 Door opening force.** The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5 pounds (22 N). For other swinging doors, as well as sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force.

**1008.1.3.1 Location of applied forces.** Forces shall be applied to the latch side of the door.

**1008.1.4 Special doors.** Special doors and security grilles shall comply with the requirements of Sections 1008.1.4.1 through 1008.1.4.4.

**1008.1.4.1 Revolving doors.** Revolving doors shall comply with the following:

1. Each revolving door shall be capable of collapsing into a bookfold position with parallel egress paths providing an aggregate width of 36 inches (914 mm).
2. A revolving door shall not be located within 10 feet (3048 mm) of the foot of or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.
3. The revolutions per minute (rpm) for a revolving door shall not exceed those shown in Table 1008.1.4.1.
4. Each revolving door shall have a side-hinged swinging door which complies with Section 1008.1 in the same wall and within 10 feet (3048 mm) of the revolving door.
5. Revolving doors shall not be part of an accessible route required by Section 1007 and *Chapter 11A or 11B*.

**TABLE 1008.1.4.1  
REVOLVING DOOR SPEEDS**

INSIDE DIAMETER (feet-inches)	POWER-DRIVEN-TYPE SPEED CONTROL (rpm)	MANUAL-TYPE SPEED CONTROL (rpm)
6-6	11	12
7-0	10	11
7-6	9	11
8-0	9	10
8-6	8	9
9-0	8	9
9-6	7	8
10-0	7	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**1008.1.4.1.1 Egress component.** A revolving door used as a component of a means of egress shall comply with Section 1008.1.4.1 and the following three conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.
2. Each revolving door shall be credited with no more than a 50-person capacity.
3. Each revolving door shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

**1008.1.4.1.2 Other than egress component.** A revolving door used as other than a component of a means of egress shall comply with Section 1008.1.4.1. The collapsing force of a revolving door not used as a component of a means of egress shall not be more than 180 pounds (801 N).

**Exception:** A collapsing force in excess of 180 pounds (801 N) is permitted if the collapsing force is reduced to not more than 130 pounds (578 N) when at least one of the following conditions is satisfied:

1. There is a power failure or power is removed to the device holding the door wings in position.
2. There is an actuation of the automatic sprinkler system where such system is provided.
3. There is an actuation of a smoke detection system which is installed in accordance with Section 907 to provide coverage in areas within the building which are within 75 feet (22 860 mm) of the revolving doors.
4. There is an actuation of a manual control switch, in an approved location and clearly defined, which reduces the holding force to below the 130-pound (578 N) force level.

**1008.1.4.2 Power-operated doors.** Where means of egress doors are operated by power, such as doors with a photoelectric-actuated mechanism to open the door upon the approach of a person, or doors with power-assisted manual operation, the design shall be such that in the event of power failure, the door is capable of being opened manually to permit means of egress travel or closed where necessary to safeguard means of egress. The forces required to open these doors manually shall not exceed those specified in Section 1008.1.3, except that the force to set the door in motion shall not exceed 50 pounds (220 N). The door shall be capable of swinging from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made. Full-power-operated doors shall comply with BHMA A156.10. Power-assisted and low-energy doors shall comply with BHMA A156.19.

**Exceptions:**

1. Occupancies in Group I-3.
2. Horizontal sliding doors complying with Section 1008.1.4.3.
3. For a biparting door in the emergency break-out mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 32-inch (813 mm) single-leaf requirement of Section 1008.1.1, provided a minimum 32-inch (813 mm) clear opening is provided when the two biparting leaves meeting in the center are broken out.

**1008.1.4.3 Horizontal sliding doors.** In other than Group H occupancies, horizontal sliding doors permitted to be a component of a means of egress in accordance with Exception 6 to Section 1008.1.2 shall comply with all of the following criteria:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method from both sides without special knowledge or effort.
3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable fire protection rating and, where rated, shall be self-closing or automatic closing by smoke detection in accordance with Section 716.5.9.3, shall be installed in accordance with NFPA 80 and shall comply with Section 716.
6. The door assembly shall have an integrated standby power supply.

7. The door assembly power supply shall be electrically supervised.

8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.

**1008.1.4.4 Security grilles.** In Groups B, F, M and S, horizontal sliding or vertical security grilles are permitted at the main exit and shall be openable from the inside without the use of a key or special knowledge or effort during periods that the space is occupied. The grilles shall remain secured in the full-open position during the period of occupancy by the general public. Where two or more means of egress are required, not more than one-half of the exits or exit access doorways shall be equipped with horizontal sliding or vertical security grilles.

**1008.1.4.4.1 Special provisions school classrooms.**

*School classrooms constructed after January 1, 1990, not equipped with automatic sprinkler systems, which have metal grilles or bars on all their windows and do not have at least two exit doors within 3 feet (914 mm) of each end of the classroom opening to the exterior of the building or to a common hallway used for evacuation purposes, shall have an inside release for the grilles or bars on at least one window farthest from the exit doors. The window or windows with the inside release shall be clearly marked as emergency exits.*

**1008.1.5 Floor elevation.** There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

**Exceptions:**

1. Doors serving individual dwelling units in Groups R-2 and R-3 where the following apply:
  - 1.1. A door is permitted to open at the top step of an interior flight of stairs, provided the door does not swing over the top step.
  - 1.2. Screen doors and storm doors are permitted to swing over stairs or landings.
2. Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1020.2, which are not on an accessible route.
3. In Group R-3 occupancies not required to be *adaptable or accessible*, the landing at an exterior doorway shall not be more than  $7\frac{3}{4}$  inches (197 mm) below the top of the threshold, provided the door, other than an exterior storm or screen door, does not swing over the landing.
4. Variations in elevation due to differences in finish materials, but not more than  $\frac{1}{2}$  inch (12.7 mm).

**1008.1.6 Landings at doors.** Landings shall have a width not less than the width of the stairway or the door, whichever is greater. Doors in the fully open position shall not reduce a required dimension by more than 7 inches (178

mm). When a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing to less than one-half its required width. Landings shall have a length measured in the direction of travel of not less than 44 inches (1118 mm).

**Exception:** Landing length in the direction of travel in Groups R-3 and U and within individual units of Group R-2 need not exceed 36 inches (914 mm).

**1008.1.7 Thresholds.** Thresholds at doorways shall not exceed  $\frac{3}{4}$  inch (19.1 mm) in height above the finished floor or landing for sliding doors serving dwelling units or  $\frac{1}{2}$  inch (12.7 mm) above the finished floor or landing for other doors. Raised thresholds and floor level changes greater than  $\frac{1}{4}$  inch (6.4 mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

**Exception:** In occupancy Group R-2 or R-3, threshold heights for sliding and side-hinged exterior doors shall be permitted to be up to  $\frac{7}{4}$  inches (197 mm) in height if all of the following apply:

1. The door is not part of the required means of egress.
2. The door is not part of an accessible route as required by Chapter 11A or 11B.
3. The door is not part of an *adaptable or accessible dwelling unit*.

**1008.1.8 Door arrangement.** Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

**Exceptions:**

1. The minimum distance between horizontal sliding power-operated doors in a series shall be 48 inches (1219 mm).
2. Storm and screen doors serving individual dwelling units in Groups R-2 and R-3 need not be spaced 48 inches (1219 mm) from the other door.
3. Doors within individual dwelling units in Groups R-2 and R-3 other than *adaptable or accessible dwelling units*.

**1008.1.9 Door operations.** Except as specifically permitted by this section egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.

**1008.1.9.1 Hardware.** Door handles, pulls, latches, locks and other operating devices on doors required to be accessible by Chapter 11A or 11B shall not require tight grasping, tight pinching or twisting of the wrist to operate.

*These design requirements for door handles, pulls, latches, locks and other operating devices, intended for use on required means of egress doors in other than Group R and M occupancies with an occupant load of 10 or less, shall comply with SFM Standard 12-10-2, Section 12-10-202 contained in the CCR, Title 24, Part 12, California Referenced Standards Code.*

**1008.1.9.2 Hardware height.** Door handles, pulls, latches, locks and other operating devices shall be installed 34 inches (864 mm) minimum and 48 inches (1219 mm) maximum above the finished floor. Locks used only for security purposes and not used for normal operation are permitted at any height.

**Exception:** Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1370 mm) maximum above the finished floor or ground, provided the self-latching devices are not also self-locking devices operated by means of a key, electronic opener or integral combination lock.

**1008.1.9.3 Locks and latches.** Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
  - 2.1. The locking device is readily distinguishable as locked;
  - 2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
  - 2.3. The use of the key-operated locking device is revokable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

**1008.1.9.4 Bolt locks.** Manually operated flush bolts or surface bolts are not permitted.

**Exceptions:**

1. On doors not required for egress in individual dwelling units or sleeping units.

2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves an occupant load of less than 50 persons in a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
4. Where a pair of doors serves a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf provided such inactive leaf is not needed to meet egress width requirements and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
5. Where a pair of doors serves patient care rooms in Group I-2 occupancies, self-latching edge- or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress width requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware.

**1008.1.9.5 Unlatching.** The unlatching of any door or leaf shall not require more than one operation.

**Exceptions:**

1. Places of detention or restraint.
2. Where manually operated bolt locks are permitted by Section 1008.1.9.4.
3. Doors with automatic flush bolts as permitted by Section 1008.1.9.3, Exception 3.
4. Doors from individual dwelling units and sleeping units of Group R occupancies as permitted by Section 1008.1.9.3, Exception 4.

**1008.1.9.5.1 Closet and bathroom doors in Group R-4 occupancies.** In Group R-4 occupancies, closet doors that latch in the closed position shall be openable from inside the closet, and bathroom doors that latch in the closed position shall be capable of being unlocked from the ingress side.

**1008.1.9.6 Reserved.**

**1008.1.9.7 Delayed egress locks.** Approved, listed, delayed egress locks shall be permitted to be installed on doors serving any occupancy except Group A, E, H and L occupancies.

**Exception:** Group A occupancy courtrooms are permitted to utilize delayed egress locks.

Buildings with delayed egress locks shall be equipped throughout with an automatic sprinkler sys-

tem in accordance with Section 903.3.1.1 and an approved automatic smoke detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 9 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit. *Delayed egress devices shall conform to all of the following:*

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of *electrical power to an one of the following:*
  - 2.1. *The egress-control device itself.*
  - 2.2. *The smoke detection system.*
  - 2.3. *Means of egress illumination as required by Section 1006.*
3. The door locks shall have the capability of being unlocked by a signal from *a switch located in an approved location.*
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only. *The time delay established for each egress-control device shall not be field adjustable. For applications listed in Section 1.9.1 regulated by the Division of the State Architect- Access Compliance, see Chapter 11B, 11B-404.2.9.*

**Exception:** In facilities housing Alzheimer's or dementia clients, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: "KEEP PUSHING. THIS DOOR WILL OPEN IN 15 [30] SECONDS. ALARM WILL SOUND" Sign lettering shall be at least 1 inch (25 mm) in height and shall have a stroke of not less than  $\frac{1}{8}$  inch (3.2 mm).
  - 5.1. A tactile sign shall also be provided in Braille and raised characters, which complies with Chapter 11B, Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5.
6. Emergency lighting shall be provided at the door.
7. Actuation of the panic bar or other door-latching hardware shall activate an audible signal at the door.
8. The unlatching shall not require more than one operation.

9. Regardless of the means of deactivation, relocking of the egress-control device shall be by manual means only at the door.

**1008.1.9.8 Access-controlled egress doors.** The entrance doors in a means of egress in buildings with an occupancy in Group A, B, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, I-2, M, R-1 and R-2, are permitted to be equipped with an approved entrance and egress access control system, listed in accordance with UL 294, which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—dependent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, I-2 or M shall not be secured from the egress side during periods that the building is open to the general public.

**1008.1.9.9 Electromagnetically locked egress doors.** Doors in the means of egress in buildings with an occupancy in Group A, B, E, M, R-1 or R-2, and doors to tenant spaces in Group A, B, E, M, R-1 or R-2, shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meet the requirements below:

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.

3. Operation of the listed hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.

4. Loss of power to the listed hardware automatically unlocks the door.
5. Where panic or fire exit hardware is required by Section 1008.1.10, operation of the listed panic or fire exit hardware also releases the electromagnetic lock.

**1008.1.9.10 Reserved.**

**1008.1.9.11 Stairway doors.** Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

**Exceptions:**

1. Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. In stairways serving not more than four stories, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side and capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.
4. Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single exit stair where permitted in Section 1021.2.
5. Stairway exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the dwelling unit is from a single exit stair where permitted in Section 1021.2.

**1008.1.9.12 Access-controlled elevator lobby doors in high-rise office buildings.** For elevator lobbies in high-rise office buildings where the occupants of the floor are not required to travel through the elevator lobby to reach an exit, when approved by the fire chief, the doors separating the elevator lobby from the adjacent occupied tenant space that also serve as the entrance doors to the tenant space shall be permitted to be equipped with an approved entrance and egress access control system provided all of the following requirements are met:

1. The building is provided throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. A smoke detector is installed on the ceiling on the tenant side of the elevator lobby doors along the

*center line of the door opening, not less than 1 foot and not more than 5 feet from the door opening, and is connected to the fire alarm system.*

3. A remote master switch capable of unlocking the elevator lobby doors shall be provided in the fire command center for use by the fire department.
4. Locks for the elevator lobby shall be U.L. and California State Fire Marshal listed fail-safe type locking mechanisms. The locking device shall automatically release on activation of any fire alarm device on the floor of alarm (waterflow, smoke detector, manual pull stations, etc.). All locking devices shall unlock, but not unlatch, upon activation.
5. A two-way voice communication system, utilizing dedicated lines, shall be provided from each locked elevator lobby to the 24-hour staffed location on site, annunciated as to location. Operating instructions shall be posted above each two-way communication device.

**Exception:** When approved by the fire chief, two-way voice communication system to an off-site facility may be permitted where means to remotely unlock the access controlled doors from the off-site facility are provided.

6. An approved momentary mushroom-shaped palm button connected to the doors and installed adjacent to each locked elevator lobby door shall be provided to release the door locks when operated by an individual in the elevator lobby. The locks shall be reset manually at the door. Mount palm button so that the center line is 48 inches above the finished floor.

Provide a sign stating:

**"IN CASE OF EMERGENCY,  
PUSH PALM BUTTON,  
DOOR WILL UNLOCK AND  
SECURITY ALARM WILL  
SOUND."**

The sign lettering shall be  $\frac{3}{4}$ -inch high letters by  $\frac{1}{8}$ -inch width stroke on a contrasting background.

7. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.

**1008.1.10 Panic and fire exit hardware.** Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A occupancy, assembly area not classified as an assembly occupancy, E, I-2 or I-2.1 occupancies shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware. For Group L occupancies see Section 443.6.3.

**Exception:** A main exit of a Group A occupancy in compliance with Section 1008.1.9.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain over-

current devices, switching devices or control devices with exit or exit access doors shall be equipped with panic hardware or fire exit hardware. The doors shall swing in the direction of egress travel.

**1008.1.10.1 Installation.** Where panic or fire exit hardware is installed, it shall comply with the following:

1. Panic hardware shall be listed in accordance with UL 305;
2. Fire exit hardware shall be listed in accordance with UL 10C and UL 305;
3. The actuating portion of the releasing device shall extend at least one-half of the door leaf width; and
4. The maximum unlatching force shall not exceed 15 pounds (67 N).

**1008.1.10.2 Balanced doors.** If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

**1008.1.11 Group E lockable doors from the inside.** New buildings that are included in public schools (kindergarten through 12th grade) state funded projects and receiving state funding pursuant to Leroy F. Green, School Facilities Act of 1998, California Education Code Sections 17070.10 through 17079, and that are submitted to the Division of the State Architect for plan review after July 1, 2011 in accordance with Education Code 17075.50, shall include locks that allow doors to classrooms and any room with an occupancy of five or more persons to be locked from the inside. The locks shall conform to the specification and requirements found in Section 1008.1.9

**Exceptions:**

1. Doors that are locked from the outside at all times such as, but not limited to, janitor's closet, electrical room, storage room, boiler room, elevator equipment room and pupil restroom.
2. Reconstruction projects that utilize original plans in accordance with California Administrative Code, Section 4-314.
3. Existing relocatable buildings that are relocated within same site in accordance with California Administrative Code, Section 4-314.

**1008.2 Gates.** Gates serving the means of egress system shall comply with the requirements of this section. Gates used as a component in a means of egress shall conform to the applicable requirements for doors.

**Exception:** Horizontal sliding or swinging gates exceeding the 4-foot (1219 mm) maximum leaf width limitation are permitted in fences and walls surrounding a stadium.

**1008.2.1 Stadiums.** Panic hardware is not required on gates surrounding stadiums where such gates are under constant immediate supervision while the public is present, and where safe dispersal areas based on 3 square feet ( $0.28 \text{ m}^2$ ) per occupant are located between the fence and

enclosed space. Such required safe dispersal areas shall not be located less than 50 feet (15 240 mm) from the enclosed space. See Section 1027.5 for means of egress from safe dispersal areas.

**1008.3 Turnstiles.** Turnstiles or similar devices that restrict travel to one direction shall not be placed so as to obstruct any required means of egress.

**Exception:** Each turnstile or similar device shall be credited with no more than a 50-person capacity where all of the following provisions are met:

1. Each device shall turn free in the direction of egress travel when primary power is lost, and upon the manual release by an employee in the area.
2. Such devices are not given credit for more than 50 percent of the required egress capacity.
3. Each device is not more than 39 inches (991 mm) high.
4. Each device has at least 16 $\frac{1}{2}$  inches (419 mm) clear width at and below a height of 39 inches (991 mm) and at least 22 inches (559 mm) clear width at heights above 39 inches (991 mm).

Where located as part of an accessible route, turnstiles shall have at least 36 inches (914 mm) clear at and below a height of 34 inches (864 mm), at least 32 inches (813 mm) clear width between 34 inches (864 mm) and 80 inches (2032 mm) and shall consist of a mechanism other than a revolving device.

**1008.3.1 High turnstile.** Turnstiles more than 39 inches (991 mm) high shall meet the requirements for revolving doors.

**1008.3.2 Additional door.** Where serving an occupant load greater than 300, each turnstile that is not portable shall have a side-hinged swinging door which conforms to Section 1008.1 within 50 feet (15 240 mm).

## SECTION 1009 STAIRWAYS

**[DSA-AC]** In addition to the requirements of this section, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, shall also comply with Chapter 11A or Chapter 11B, Sections 11B-210 and 11B-504, as applicable.

**1009.1 General.** Stairways serving occupied portions of a building shall comply with the requirements of this section.

**1009.2 Interior exit stairways.** Interior exit stairways shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1.

**1009.2.1 Where required.** Interior exit stairways shall be included, as necessary, to meet one or more means of

egress design requirements, such as required number of exits or exit access travel distance.

**1009.2.2 Enclosure.** All interior exit stairways shall be enclosed in accordance with the provisions of Section 1022.

**1009.3 Exit access stairways.** Floor openings between stories created by exit access stairways shall be enclosed.

**Exceptions:**

1. In other than Group I-2, I-2.1, I-3 and R-2.1 occupancies, exit access stairways that serve, or atmospherically communicate between, only two stories are not required to be enclosed.
2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In buildings with only Group B or M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
4. In other than Group B, I-2, I-2.1, I-3 and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
5. Exit access stairways within an atrium complying with the provisions of Section 404 are not required to be enclosed.
6. Exit access stairways and ramps in open parking garages that serve only the parking garage are not required to be enclosed.
7. Stairways serving outdoor facilities where all portions of the means of egress are essentially open to the outside are not required to be enclosed.
8. Exit access stairways serving stages, platforms and technical production areas in accordance with Sections 410.6.2 and 410.6.3 are not required to be enclosed.
9. Stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.

10. In Group I-3 occupancies, exit access stairways constructed in accordance with Section 408.5 are not required to be enclosed.
11. *Fixed guideway transit stations, constructed in accordance with Section 433.*

**1009.3.1 Construction.** Where required, enclosures for exit access stairways shall be constructed in accordance with this section. Exit access stairway enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.

**1009.3.1.1 Materials.** Exit access stairway enclosures shall be of materials permitted by the building type of construction.

**1009.3.1.2 Fire-resistance rating.** Exit access stairway enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit access stairway enclosures shall include any basements, but not any mezzanines. Exit access stairway enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

**1009.3.1.3 Continuity.** Exit access stairway enclosures shall have continuity in accordance with Section 707.5 for fire barriers or Section 711.4 for horizontal assemblies as applicable.

**1009.3.1.4 Openings.** Openings in an exit access stairway enclosure shall be protected in accordance with Section 716 as required for fire barriers. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**1009.3.1.4.1 Prohibited openings.** Openings other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.

**1009.3.1.5 Penetrations.** Penetrations in an exit access stairway enclosure shall be protected in accordance with Section 714 as required for fire barriers.

**1009.3.1.5.1 Prohibited penetrations.** Penetrations other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.

**1009.3.1.6 Joints.** Joints in an exit access stairway enclosure shall comply with Section 715.

**1009.3.1.7 Ducts and air transfer openings.** Penetrations of an exit access stairway enclosure by ducts and air transfer openings shall comply with Section 717.

**1009.3.1.8 Exterior walls.** Where exterior walls serve as a part of an exit access stairway enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

**1009.4 Width.** The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less

than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

**Exceptions:**

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.12.
3. Aisle stairs complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

*Means of egress stairs in a Group I-2 or I-2.1 occupancy used for the movement of beds and litter patients shall provide a clear width not less than 44 inches (1118 mm).*

**1009.5 Headroom.** Stairways shall have a minimum headroom clearance of 80 inches (2032 mm) measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing.

**Exceptions:**

1. Spiral stairways complying with Section 1009.12 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of  $4\frac{3}{4}$  inches (121 mm).

**1009.6 Walkline.** The walkline across winder treads shall be concentric to the direction of travel through the turn and located 12 inches (305 mm) from the side where the winders are narrower. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.

**1009.7 Stair treads and risers.** Stair treads and risers shall comply with Sections 1009.7.1 through 1009.7.5.3.

**1009.7.1 Dimension reference surfaces.** For the purpose of this section, all dimensions are exclusive of carpets, rugs or runners.

**1009.7.2 Riser height and tread depth.** Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102

mm) minimum. The riser height shall be measured vertically between the nosings of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's nosing. Winder treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

**Exceptions:**

1. Alternating tread devices in accordance with Section 1009.13.
2. Ship ladders in accordance with Section 1009.14.
3. Spiral stairways in accordance with Section 1009.12.
4. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.
5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be  $7\frac{3}{4}$  inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing projection not less than  $\frac{3}{4}$  inch (19.1 mm) but not more than  $1\frac{1}{4}$  inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3404.1 for the replacement of existing stairways. *[DSA-AC] For applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, see Chapter 11B, Section 11B-202.*
7. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet ( $23\text{ m}^2$ ) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).
8. *[SFM] Stairways providing access to lifeguard towers not open to the public, not more than 250 square feet ( $23\text{ m}^2$ ) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).*

**1009.7.3 Winder treads.** Winder treads are not permitted in means of egress stairways except within a dwelling unit.

**Exceptions:**

1. Curved stairways in accordance with Section 1009.11.

2. Spiral stairways in accordance with Section 1009.12.

**1009.7.4 Dimensional uniformity.** Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed  $\frac{3}{8}$  inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the walkline within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch (9.5 mm).

**Exceptions:**

1. Nonuniform riser dimensions of aisle stairs complying with Section 1028.11.2.
2. Consistently shaped winders, complying with Section 1009.7, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping public way, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

**1009.7.5 Nosing and riser profile.** The radius of curvature at the leading edge of the tread shall be not greater than  $\frac{9}{16}$  inch (14.3 mm). Beveling of nosings shall not exceed  $\frac{9}{16}$  inch (14.3 mm). Risers shall be solid and vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.52 rad) from the vertical.

**1009.7.5.1 Nosing projection size.** The leading edge (nosings) of treads shall project not more than  $1\frac{1}{4}$  inches (32 mm) beyond the tread below.

**1009.7.5.2 Nosing projection uniformity.** All nosing projections of the leading edges shall be of uniform size, including the projections of the nosings leading edge of the floor at the top of a flight.

**1009.7.5.3 Solid risers.** Risers shall be solid.

**Exceptions:**

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in Group F, H and S occupancies other than areas accessible to the public. There are no restrictions on the size of the opening in the riser.

3. Solid risers are not required for spiral stairways constructed in accordance with Section 1009.12.
4. Solid risers are not required for alternating tread devices constructed in accordance with Section 1009.13.

**1009.8 Stairway landings.** There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth need not exceed 48 inches (1219 mm). Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

**Exceptions:**

1. Aisle stairs complying with Section 1028.
2. [SFM] In Group R-3 occupancies a floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs.

**1009.9 Stairway construction.** All stairways shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood handrails shall be permitted for all types of construction.

**1009.9.1 Stairway walking surface.** The walking surface of treads and landings of a stairway shall not be sloped steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Stairway treads and landings shall have a solid surface. Finish floor surfaces shall be securely attached.

**Exceptions:**

1. Openings in stair walking surfaces shall be a size that does not permit the passage of  $\frac{1}{2}$ -inch-diameter (12.7 mm) sphere. Elongated openings shall be placed so that the long dimension is perpendicular to the direction of travel.
2. In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of  $1\frac{1}{8}$  inches (29 mm) cannot pass through the opening.

**1009.9.2 Outdoor conditions.** Outdoor stairways and outdoor approaches to stairways shall be designed so that water will not accumulate on walking surfaces.

**1009.9.3 Enclosures under interior stairways.** The walls and soffits within enclosed usable spaces under enclosed and unenclosed stairways shall be protected by 1-hour fire-resistance-rated construction or the fire-resistance rating of the stairway enclosure, whichever is greater. Access

to the enclosed space shall not be directly from within the stair enclosure.

**Exception:** Spaces under stairways serving and contained within a single residential dwelling unit in Group R-2 or R-3 shall be permitted to be protected on the enclosed side with  $\frac{1}{2}$ -inch (12.7 mm) gypsum board.

**1009.9.4 Enclosures under exterior stairways.** There shall be no enclosed usable space under exterior exit stairways unless the space is completely enclosed in 1-hour fire-resistance-rated construction. The open space under exterior stairways shall not be used for any purpose.

**1009.10 Vertical rise.** A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

**Exceptions:**

1. Aisle stairs complying with Section 1028.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.

**1009.11 Curved stairways.** Curved stairways with winder treads shall have treads and risers in accordance with Section 1009.7 and the smallest radius shall not be less than twice the required width of the stairway.

**Exception:** The radius restriction shall not apply to curved stairways for occupancies in Group R-3 and within individual dwelling units in occupancies in Group R-2.

**1009.12 Spiral stairways.** Spiral stairways are permitted to be used as a component in the means of egress only within dwelling units or from a space not more than 250 square feet ( $23 \text{ m}^2$ ) in area and serving not more than five occupants, or from technical production areas in accordance with Section 410.6.

A spiral stairway shall have a  $7\frac{1}{2}$ -inch (191 mm) minimum clear tread depth at a point 12 inches (305 mm) from the narrow edge. The risers shall be sufficient to provide a headroom of 78 inches (1981 mm) minimum, but riser height shall not be more than  $9\frac{1}{2}$  inches (241 mm). The minimum stairway clear width at and below the handrail shall be 26 inches (660 mm).

**1009.13 Alternating tread devices.** Alternating tread devices are limited to an element of a means of egress in buildings of Groups F, H and S from a mezzanine not more than 250 square feet ( $23 \text{ m}^2$ ) in area and which serves not more than five occupants; in buildings of Group I-3 from a guard tower, observation station or control room not more than 250 square feet ( $23 \text{ m}^2$ ) in area and for access to unoccupied roofs.

**1009.13.1 Handrails of alternating tread devices.** Handrails shall be provided on both sides of alternating tread devices and shall comply with Section 1012.

**1009.13.2 Treads of alternating tread devices.** Alternating tread devices shall have a minimum tread depth of 5 inches (127 mm), a minimum projected tread depth of  $8\frac{1}{2}$

## MEANS OF EGRESS

inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of 9 $\frac{1}{2}$  inches (241 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The riser height and tread depth provided shall result in an angle of ascent from the horizontal of between 50 and 70 degrees (0.87 and 1.22 rad). The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

**Exception:** Alternating tread devices used as an element of a means of egress in buildings from a mezzanine area not more than 250 square feet ( $23\text{ m}^2$ ) in area which serves not more than five occupants shall have a minimum tread depth of 3 inches (76 mm) with a minimum projected tread depth of 10 $\frac{1}{2}$  inches (267 mm). The rise to the next alternating tread surface shall not exceed 8 inches (203 mm).

**1009.14 Ship ladders.** Ship ladders are permitted to be used in Group I-3 as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 square feet ( $23\text{ m}^2$ ) with not more than three occupants and for access to unoccupied roofs.

Ship ladders shall have a minimum tread depth of 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the nosing projection is no less than 8 $\frac{1}{2}$  inches (216 mm). The maximum riser height shall be 9 $\frac{1}{2}$  inches (241 mm).

Handrails shall be provided on both sides of ship ladders. The minimum clear width at and below the handrails shall be 20 inches (508 mm).

**1009.15 Handrails.** Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

*[DSA-AC] For applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, see Chapter 11B, Sections 11B-504.6 and 11B-505.*

### Exceptions:

1. Handrails for aisle stairs provided in accordance with Section 1028.13.
2. Stairways within dwelling units and spiral stairways are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. *[SFM] In Group R-3 occupancies, a continuous run of treads or flight of stairs with less than four risers does not require handrails.*
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Groups R-2 and R-3 do not require handrails.

**1009.16 Stairway to roof.** In buildings four or more stories above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device.

**1009.16.1 Roof access.** Where a stairway is provided to a roof, access to the roof shall be provided through a penthouse complying with Section 1509.2.

**Exception:** In buildings without an occupied roof, access to the roof shall be permitted to be a roof hatch or trap door not less than 16 square feet ( $1.5\text{ m}^2$ ) in area and having a minimum dimension of 2 feet (610 mm).

**1009.16.2 Protection at roof hatch openings.** Where the roof hatch opening providing the required access is located within 10 feet (3049 mm) of the roof edge, such roof access or roof edge shall be protected by guards installed in accordance with the provisions of Section 1013.

**1009.17 Stairway to elevator equipment.** Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway.

## SECTION 1010 RAMPS

*[DSA-AC] In addition to the requirements of this section, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, shall also comply with Chapter 11A or Chapter 11B, Section 11B-405, as applicable.*

**1010.1 Scope.** The provisions of this section shall apply to ramps used as a component of a means of egress.

### Exceptions:

1. Other than ramps that are part of the accessible routes providing access in accordance with Chapter 11A or 11B, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with Chapter 11A or 11B, 11B-406, as applicable.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.4 through 1010.10 when they are not an accessible route serving accessible parking spaces, other required accessible elements or part of an accessible means of egress.

**1010.2 Enclosure.** All interior exit ramps shall be enclosed in accordance with the applicable provisions of Section 1022. Exit access ramps shall be enclosed in accordance with the provisions of Section 1009.3 for enclosure of stairways.

**1010.3 Slope.** Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedes-

trian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

**Exception:** Aisle ramp slope in a room or space used for assembly purposes shall comply with Section 1028.11.

**1010.4 Cross slope.** The slope measured perpendicular to the direction of travel of a ramp shall not be steeper than one unit vertical in 48 units horizontal (2-percent slope).

**1010.5 Vertical rise.** The rise for any ramp run shall be 30 inches (762 mm) maximum.

**1010.6 Minimum dimensions.** The minimum dimensions of means of egress ramps shall comply with Sections 1010.6.1 through 1010.6.3.

**1010.6.1 Width.** The minimum width of a means of egress ramp shall not be less than that required for corridors by Section 1018.2. The clear width of a ramp between handrails, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

**1010.6.2 Headroom.** The minimum headroom in all parts of the means of egress ramp shall not be less than 80 inches (2032 mm).

**1010.6.3 Restrictions.** Means of egress ramps shall not reduce in width in the direction of egress travel. Projections into the required ramp and landing width are prohibited. Doors opening onto a landing shall not reduce the clear width to less than 42 inches (1067 mm).

**1010.7 Landings.** Ramps shall have landings at the bottom and top of each ramp, points of turning, entrance, exits and at doors. Landings shall comply with Sections 1010.7.1 through 1010.7.5.

**1010.7.1 Slope.** Landings shall have a slope not steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Changes in level are not permitted.

**1010.7.2 Width.** The landing shall be at least as wide as the widest ramp run adjoining the landing.

**1010.7.3 Length.** The landing length shall be 60 inches (1525 mm) minimum.

**Exceptions:**

1. In Group R-2 and R-3 individual dwelling and sleeping units that are not required to be *accessible* in accordance with Chapter 11A, landings are permitted to be 36 inches (914 mm) minimum.
2. Where the ramp is not a part of an accessible route, the length of the landing shall not be required to be more than 48 inches (1220 mm) in the direction of travel.

**1010.7.4 Change in direction.** Where changes in direction of travel occur at landings provided between ramp runs, the landing shall be 60 inches by 60 inches (1524 mm by 1524 mm) minimum.

**Exception:** In Group R-2 and R-3 individual dwelling or sleeping units that are not required to be *accessible*

in accordance with Chapter 11A, landings are permitted to be 36 inches by 36 inches (914 mm by 914 mm) minimum.

**1010.7.5 Doorways.** Where doorways are located adjacent to a ramp landing, maneuvering clearances required for accessibility are permitted to overlap the required landing area as specified in Chapter 11A.

**1010.8 Ramp construction.** All ramps shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood handrails shall be permitted for all types of construction.

**1010.8.1 Ramp surface.** The surface of ramps shall be of slip-resistant materials that are securely attached.

**1010.8.2 Outdoor conditions.** Outdoor ramps and outdoor approaches to ramps shall be designed so that water will not accumulate on walking surfaces.

**1010.9 Handrails.** Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

**Exception:** Handrails for ramped aisles provided in accordance with Section 1028.13.

**1010.10 Edge protection.** Edge protection complying with Section 1010.10.1 or 1010.10.2 shall be provided on each side of ramp runs and at each side of ramp landings.

**Exceptions:**

1. Edge protection is not required on ramps that are not required to have handrails, provided they have flared sides that comply with Chapter 11A or 11B.
2. Edge protection is not required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection is not required on the sides of ramp landings having a vertical drop off of not more than  $\frac{1}{2}$  inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.
4. In assembly spaces with fixed seating, edge protection is not required on the sides of ramps where the ramps provide access to the adjacent seating and aisle accessways.

**1010.10.1 Curb, rail, wall or barrier.** A curb, rail, wall or barrier shall be provided to serve as edge protection. A curb must be a minimum of 4 inches (102 mm) in height. Barriers must be constructed so that the barrier prevents the passage of a 4-inch-diameter (102 mm) sphere, where any portion of the sphere is within 4 inches (102 mm) of the floor or ground surface.

**1010.10.2 Extended floor or ground surface.** The floor or ground surface of the ramp run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with Section 1012.

**1010.11 Guards.** Guards shall be provided where required by Section 1013 and shall be constructed in accordance with Section 1013.

## SECTION 1011 EXIT SIGNS

**1011.1 Where required.** Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30 480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

**Exceptions:**

1. Exit signs are not required in rooms or areas that require only one exit or exit access.
2. Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2, R-3 or R-3.1.
4. Exit signs are not required where inmates are housed, or held in dayrooms, sleeping rooms or dormitories in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

**1011.2 Floor-level exit signs in Group R-1.** See Section 1011.7.

**1011.3 Illumination.** Exit signs shall be internally or externally illuminated.

**Exception:** Tactile signs required by Section 1011.4 need not be provided with illumination.

**1011.4 Raised character and Braille exit signs.** Tactile exit signs shall be required at the following locations:

1. Each grade-level exterior exit door that is required to comply with Section 1011.1, shall be identified by a tactile exit sign with the word, "EXIT."
2. Each exit door that is required to comply with Section 1011.1, and that leads directly to a grade-level exterior exit by means of a stairway or ramp shall be identified by a tactile exit sign with the following words as appropriate:
  - 2.1. "EXIT STAIR DOWN"
  - 2.2. "EXIT RAMP DOWN"
  - 2.3. "EXIT STAIR UP"
  - 2.4. "EXIT RAMP UP"

3. Each exit door that is required to comply with Section 1011.1, and that leads directly to a grade-level exterior exit by means of an exit enclosure or an exit passageway shall be identified by a tactile exit sign with the words, "EXIT ROUTE."

4. Each exit access door from an interior room or area to a corridor or hallway that is required to comply with Section 1011.1, shall be identified by a tactile exit sign with the words "EXIT ROUTE."
5. Each exit door through a horizontal exit that is required to comply with Section 1011.1, shall be identified by a sign with the words, "TO EXIT."

Raised character and Braille exit signs shall comply with Chapter 11A, Section 1143A or Chapter 11B, Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5.

**1011.5 Internally illuminated exit signs.** Electrically powered, self-luminous and photoluminescent exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Chapter 27. Exit signs shall be illuminated at all times.

**1011.6 Externally illuminated exit signs.** Externally illuminated exit signs shall comply with Sections 1011.6.1 through 1011.6.3.

**1011.6.1 Graphics.** Every exit sign and directional exit sign shall have plainly legible letters not less than 6 inches (152 mm) high with the principal strokes of the letters not less than  $\frac{3}{4}$  inch (19.1 mm) wide. The word "EXIT" shall have letters having a width not less than 2 inches (51 mm) wide, except the letter "I," and the minimum spacing between letters shall not be less than  $\frac{3}{8}$  inch (9.5 mm). Signs larger than the minimum established in this section shall have letter widths, strokes and spacing in proportion to their height.

The word "EXIT" shall be in high contrast with the background and shall be clearly discernible when the means of exit sign illumination is on or not energized. If a chevron directional indicator is provided as part of the exit sign, the construction shall be such that the direction of the chevron directional indicator cannot be readily changed.

**1011.6.2 Exit sign illumination.** The face of an exit sign illuminated from an external source shall have an intensity of not less than 5 footcandles (54 lux).

**1011.6.3 Power source.** Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

**Exception:** Approved exit sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

**1011.7 Floor-level exit signs.** Where exit signs are required by Chapter 10, additional approved low-level exit signs which are internally or externally illuminated photoluminescent or self-luminous, shall be provided in all interior corridors of Group A, E, I and R-2.1 occupancies and in all areas serving guest rooms of hotels in Group R, Division 1 occupancies.

**Exceptions:**

1. Group A occupancies that are protected throughout by an approved supervised fire sprinkler system.
2. Group E Occupancies where direct exits have been provided from each classroom.
3. Group I and R-2.1 occupancies which are provided with smoke barriers constructed in accordance with Section 407.5.
4. Group I-3 occupancies.

The bottom of the sign shall not be less than 6 inches (152 mm) or more than 8 inches (203 mm) above the floor level and shall indicate the path of exit travel. For exit and exit-access doors, the sign shall be on the door or adjacent to the door with the closest edge of the sign or marker within 4 inches (102 mm) of the door frame.

**Note:** Pursuant to Health and Safety Code Section 13143, this California amendment applies to all newly constructed buildings or structures subject to this section for which a building permit is issued (or construction commenced, where no building permit is issued) on or after January 1, 1989.

**1011.8 Path marking.** When exit signs are required by Chapter 10, in addition to approved floor-level exit signs, approved path marking shall be installed at floor level or no higher than 8 inches (203 mm) above the floor level in all interior rated exit corridors of unsprinklered Group A, R-1 and R-2 occupancies.

Such marking shall be continuous except as interrupted by door-ways, corridors or other such architectural features in order to provide a visible delineation along the path of travel.

**Note:** Pursuant to Health and Safety Code Section 13143, the California amendments of this section shall apply to all newly constructed buildings or structures subject to this section for which a building permit is issued (or construction commenced, where no building permit is issued) on or after January 1, 1989.

## SECTION 1012 HANDRAILS

[DSA-AC] In addition to the requirements of this section, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, shall also comply with Chapter 11A or Chapter 11B, Section 11B-505, as applicable.

**1012.1 Where required.** Handrails for stairways and ramps shall be adequate in strength and attachment in accordance

with Section 1607.8. Handrails required for stairways by Section 1009.15 shall comply with Sections 1012.2 through 1012.9. Handrails required for ramps by Section 1010.9 shall comply with Sections 1012.2 through 1012.8.

**1012.2 Height.** Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

**Exceptions:**

1. When handrail fittings or bendings are used to provide continuous transition between flights, the fittings or bendings shall be permitted to exceed the maximum height.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual dwelling units in Group R-2 occupancies; when handrail fittings or bendings are used to provide continuous transition between flights, transition at winder treads, transition from handrail to guard, or when used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

**1012.3 Handrail graspability.** All required handrails shall comply with Section 1012.3.1 or shall provide equivalent graspability.

**Exception:** In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I in accordance with Section 1012.3.1, Type II in accordance with Section 1012.3.2 or shall provide equivalent graspability.

**1012.3.1 Type I.** Handrails with a circular cross section shall have an outside diameter of at least  $1\frac{1}{4}$  inches (32 mm) and not greater than 2 inches (51 mm). Where the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than  $6\frac{1}{4}$  inches (160 mm) with a maximum cross-sectional dimension of  $2\frac{1}{4}$  inches (57 mm) and minimum cross-sectional dimension of 1 inch (25 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

**1012.3.2 Type II.** Handrails with a perimeter greater than  $6\frac{1}{4}$  inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of  $\frac{3}{4}$  inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least  $\frac{5}{16}$  inch (8 mm) within  $\frac{7}{8}$  inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least  $\frac{3}{8}$  inch (10 mm) to a level that is not less than  $1\frac{3}{4}$  inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be  $1\frac{1}{4}$  inches (32 mm)

to a maximum of  $2\frac{3}{4}$  inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

**1012.4 Continuity.** Handrail gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

**Exceptions:**

1. Handrails within dwelling units are permitted to be interrupted by a newel post at a turn or landing.
2. Within a dwelling unit, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within  $1\frac{1}{2}$  inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each  $\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of  $1\frac{1}{2}$  inches (38 mm) shall be permitted to be reduced by  $\frac{1}{8}$  inch (3 mm).
4. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.

**1012.5 Fittings.** Handrails shall not rotate within their fittings.

**1012.6 Handrail extensions.** Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run. Where handrails are not continuous between flights, the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrails shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. The extensions of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

**Exceptions:**

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. Aisle handrails in rooms or spaces used for assembly purposes in accordance with Section 1028.13.
3. Handrails for alternating tread devices and ship ladders are permitted to terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices and ship ladders are not required to be continuous between flights or to extend beyond the top or bottom risers.

**1012.7 Clearance.** Clear space between a handrail and a wall or other surface shall be a minimum of  $1\frac{1}{2}$  inches (38 mm). A handrail and a wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements.

**1012.8 Projections.** On ramps, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of stairways and ramps at each side shall not exceed  $4\frac{1}{2}$  inches (114 mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1009.5. Projections due to intermediate handrails shall not constitute a reduction in the egress width.

*In Group I-2 occupancy ramps required for exit access shall not be less than 8 ft in width and handrails are permitted to protrude  $3\frac{1}{2}$  inches from the wall on both sides. Ramps used as exits and stairways used for the movement of bed and litter patients, the clear width between handrails shall be 44 inches (1118 mm) minimum.*

**1012.9 Intermediate handrails.** Stairways shall have intermediate handrails located in such a manner that all portions of the stairway width required for egress capacity are within 30 inches (762 mm) of a handrail. On monumental stairs, handrails shall be located along the most direct path of egress travel.

## SECTION 1013 GUARDS

**1013.1 General.** Guards shall comply with the provisions of Sections 1013.2 through 1013.7. Operable windows with sills located more than 72 inches (1.83 m) above finished grade or other surface below shall comply with Section 1013.8.

**1013.2 Where required.** Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.8.

**Exception:** Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1028.14 are permitted and provided.

**1013.2.1 Glazing.** Where glass is used to provide a guard or as a portion of the guard system, the guard shall also

comply with Section 2407. Where the glazing provided does not meet the strength and attachment requirements of Section 1607.8, complying guards shall also be located along glazed sides of open-sided walking surfaces.

**1013.3 Height.** Required guards shall not be less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces;
2. On stairs, from the line connecting the leading edges of the tread nosings; and
3. On ramps, from the ramp surface at the guard.

**Exceptions:**

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
3. The guard height in assembly seating areas shall comply with Section 1028.14.
4. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

**1013.4 Opening limitations.** Required guards shall not have openings which allow passage of a sphere 4 inches (102 mm) in diameter from the walking surface to the required guard height.

**Exceptions:**

1. From a height of 36 inches (914 mm) to 42 inches (1067 mm), guards shall not have openings which allow passage of a sphere  $4\frac{3}{8}$  inches (111 mm) in diameter.
2. The triangular openings at the open sides of a stair, formed by the riser, tread and bottom rail shall not allow passage of a sphere 6 inches (152 mm) in diameter.
3. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
4. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices and ship ladders, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
5. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies

and galleries shall not have openings which allow passage of a sphere 4 inches in diameter (102 mm) up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, guards shall not have openings which allow passage of a sphere 8 inches (203 mm) in diameter.

**6.** Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, guards on the open sides of stairs shall not have openings which allow passage of a sphere  $4\frac{3}{8}$  (111 mm) inches in diameter.

**7. In lifeguard towers not open to the public, guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.**

**1013.5 Screen porches.** Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

**1013.6 Mechanical equipment.** Guards shall be provided where appliances, equipment, fans, roof hatch openings or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inches (533 mm) in diameter. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliance, equipment, fan or component.

**1013.7 Roof access.** Guards shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inches (533 mm) in diameter.

**1013.8 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 36 inches (915 mm) above the finished floor surface of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter (102 mm) sphere where such openings are located within 36 inches (915 mm) of the finished floor.

**Exceptions:**

1. Operable windows where the sill portion of the opening is located more than 75 feet (22 860 mm) above the finished grade or other surface below and that are provided with window fall prevention devices that comply with ASTM F 2006.
2. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.

3. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with window opening control devices that comply with Section 1013.8.1.

**1013.8.1 Window opening control devices.** Window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2.

## SECTION 1014 EXIT ACCESS

**1014.1 General.** The exit access shall comply with the applicable provisions of Sections 1003 through 1013. Exit access arrangement shall comply with Sections 1014 through 1019.

**1014.2 Egress through intervening spaces.** Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.

**Exception:** Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. An exit access shall not pass through a room that can be locked to prevent egress.
3. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.
4. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

**Exceptions:**

1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
2. Means of egress are not prohibited through stockrooms in Group M occupancies when all of the following are met:

- 2.1. The stock is of the same hazard classification as that found in the main retail area;
- 2.2. Not more than 50 percent of the exit access is through the stockroom;
- 2.3. The stockroom is not subject to locking from the egress side; and
- 2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) aisle defined by

full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

5. Exits shall not pass through any room subject to locking except in Group I-3 occupancies classified as detention facilities.

**1014.2.1 Multiple tenants.** Where more than one tenant occupies any one floor of a building or structure, each tenant space, dwelling unit and sleeping unit shall be provided with access to the required exits without passing through adjacent tenant spaces, dwelling units and sleeping units.

**Exception:** The means of egress from a smaller tenant space shall not be prohibited from passing through a larger adjoining tenant space where such rooms or spaces of the smaller tenant occupy less than 10 percent of the area of the larger tenant space through which they pass; are the same or similar occupancy group; a discernable path of egress travel to an exit is provided; and the means of egress into the adjoining space is not subject to locking from the egress side. A required means of egress serving the larger tenant space shall not pass through the smaller tenant space or spaces.

**1014.2.2 Basement exits in Group I-2 occupancies.** For additional requirements for occupancies in Group I-2 or I-2.1, see Section 407.

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**1014.3 Common path of egress travel.** The common path of egress travel shall not exceed the common path of egress travel distances in Table 1014.3.

TABLE 1014.3  
COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)	
	Occupant Load			
	≤ 30	> 30		
B, S <sup>d</sup>	100	75	100 <sup>a</sup>	
U	100	75	75 <sup>a</sup>	
F	75	75	100 <sup>a</sup>	
H-1, H-2, H-3	Not Permitted	Not Permitted	25 <sup>a</sup>	
R-2	75	75	125 <sup>b</sup>	
R-3 <sup>c</sup>	75	75	125 <sup>b</sup>	
I-3	100	100	100 <sup>a</sup>	
All others <sup>e,f</sup>	75	75	75 <sup>a</sup>	

For SI: 1 foot = 304.8 mm.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- c. For a room or space used for assembly purposes having fixed seating, see Section 1028.8.
- d. The length of a common path of egress travel in a Group S-2 open parking garage shall not be more than 100 feet (30 480 mm).
- e. The length of a common path of egress travel in a Group R-3 occupancy located in a mixed occupancy building.
- f. For the distance limitations in Group I-2 or I-2.1, see Section 407.4.

## SECTION 1015 EXIT AND EXIT ACCESS DOORWAYS

**1015.1 Exits or exit access doorways from spaces.** Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

**Exceptions:**

1. In Group R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Care suites in Group I-2 or I-2.1 occupancies complying with Section 407.4.3.
2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.
4. *In detention and correctional facilities and holding cells, such as are found in courthouse buildings, when the occupant load is more than 20 see Section 408.3.11.*

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

**TABLE 1015.1  
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E, F, M, U	49
H 1, H 2, H-3	3
H 4, H 5, I 2.1, I 3, I 4, R	10
S	29
L	<i>See Section 443.6.1</i>

a. For holding cells, see Section 408.3.11.

**1015.1.1 Three or more exits or exit access doorways.** Three exits or exit access doorways shall be provided from any space with an occupant load of 501 to 1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

**1015.2 Exit or exit access doorway arrangement.** Required exits shall be located in a manner that makes their availability obvious. Exits shall be unobstructed at all times. Exit and exit access doorways shall be arranged in accordance with Sections 1015.2.1 and 1015.2.2. *Exit access doorways, contributing to the total number of exits or exit access doorways required by Sections 1015.1 and 1015.1.1, shall lead to separate exits.*

**1015.2.1 Two exits or exit access doorways.** Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access door-

ways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways. Interlocking or scissor stairs shall be counted as one exit stairway.

**Exceptions:**

- 1 Where interior exit stairways are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

**1015.2.2 Three or more exits or exit access doorways.** Where access to three or more exits is required, at least two exit doors or exit access doorways shall be arranged in accordance with the provisions of Section 1015.2.1. *Additional required exit or exit access doorways shall be arranged a reasonable distance apart so that if one becomes blocked, the others will be available.*

**1015.3 Boiler, incinerator and furnace rooms.** Two exit access doorways are required in boiler, incinerator and furnace rooms where the area is over 500 square feet ( $46\text{ m}^2$ ) and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422 000 KJ) input capacity. Where two exit access doorways are required, one is permitted to be a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room.

**1015.4 Refrigeration machinery rooms.** Machinery rooms larger than 1,000 square feet ( $93\text{ m}^2$ ) shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the occupant load served. Doors shall be tight fitting and self-closing.

**1015.5 Refrigerated rooms or spaces.** Rooms or spaces having a floor area larger than 1,000 square feet ( $93\text{ m}^2$ ), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two exits or exit access doorways.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an exit or exit access doorway where such rooms are not protected by an approved automatic sprinkler system. Egress is allowed through adjoining refrigerated rooms or spaces.

**Exception:** Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *California Mechanical Code*.

**1015.6 Day care means of egress.** Day care facilities, rooms or spaces where care is provided for more than 10 children that are 2 years of age or less, shall have access to not less than two exits or exit access doorways.

**1015.7 Large family day-care home.** Every story or basement of a large family day-care home shall be provided with two exits which are remotely located from each other. Every required exit shall be of a size to permit the installation of a door not less than 32 inches (813 mm) in clear width and not less than 6 feet 8 inches (2,032 mm) in height. A manually operated horizontal sliding door may be used as one of the two required exits.

Where basements are used for day-care purposes, one of the two required exits shall provide access directly to the exterior without entering the first story. The second exit from the basement may either pass through the story above or exit directly to the exterior.

Rooms used for day-care purposes shall not be located above the first story.

**Exception:** Buildings equipped with an automatic sprinkler system throughout and which have at least one of the required exits providing access directly to the exterior. NFPA 13R may be used in large family day-care homes. The sprinkler omissions of NFPA 13R shall not apply unless approved by the enforcing agency.

Exit doors, including manually operated horizontal sliding doors, shall be openable from the inside without use of a key or any special knowledge or effort.

Tables 1021.1 and 1021.2 are not applicable to this occupancy classification.

## SECTION 1016 EXIT ACCESS TRAVEL DISTANCE

**1016.1 General.** Travel distance within the exit access portion of the means of egress system shall be in accordance with this section.

**1016.2 Limitations.** Exit access travel distance shall not exceed the values given in Table 1016.2.

**1016.2.1 Exterior egress balcony increase.** Exit access travel distances specified in Table 1016.2 shall be increased up to an additional 100 feet (30 480 mm) provided the last portion of the exit access leading to the exit occurs on an exterior egress balcony constructed in accor-

TABLE 1016.2  
EXIT ACCESS TRAVEL DISTANCE<sup>a</sup>

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F 1, M, R, S 1	200	250 <sup>b</sup>
R 2.1	Not Permitted	250 <sup>c</sup>
B	200	300 <sup>c</sup>
F 2, S 2, U	300	400 <sup>c</sup>
H 1	Not Permitted	75 <sup>c</sup>
H 2	Not Permitted	100 <sup>c</sup>
H 3	Not Permitted	150 <sup>c</sup>
H 4	Not Permitted	175 <sup>c</sup>
H 5	Not Permitted	200 <sup>c</sup>
I 2, I-2.1, I 3 <sup>d</sup> , I 4	Not Permitted	200 <sup>c</sup>
L	Not Permitted	200 <sup>c</sup>

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

- Section 402.8: For the distance limitation in malls.
  - Section 404.9: For the distance limitation through an atrium space.
  - Section 407.4: For the distance limitation in Group I 2 or I-2.1.
  - Section 408.3.10: For increased limitation in Group I 3
  - Sections 408.6.1 and 408.8.1: For the distance limitations in Group I 3.
  - Section 411.4: For the distance limitation in special amusement buildings.
  - Section 1015.4: For the distance limitation in refrigeration machinery rooms.
  - Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
  - Section 1016.2.2: For increased limitation in Groups F-1 and S-1.
  - Section 1021.2: For buildings with one exit.
  - Section 1028.7: For increased limitation in assembly seating.
  - Section 1028.7: For increased limitation for assembly open air seating.
  - Section 3103.4: For temporary structures.
  - Section 3104.9: For pedestrian walkways.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- d. Not permitted in nonsprinklered Group I 3 Occupancies.

dance with Section 1019. The length of such balcony shall not be less than the amount of the increase taken.

**1016.2.2 Group F-1 and S-1 increase.** The maximum exit access travel distance shall be 400 feet (122 m) in Group F-1 or S-1 occupancies where all of the following are met:

1. The portion of the building classified as Group F-1 or S-1 is limited to one story in height,
2. The minimum height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet (7315 mm), and
3. The building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1.

**1016.3 Measurement.** Exit access travel distance shall be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit.

**Exceptions:**

1. In open parking garages, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.
2. In outdoor facilities with open exit access components, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.

**1016.3.1 Exit access stairways and ramps.** Travel distance on exit access stairways or ramps shall be included in the exit access travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings. The measurement along ramps shall be made on the walking surface in the center of the ramp and landings.

## SECTION 1017 AISLES

*[DSA-AC] In addition to the requirements of this section, means of egress, which provide access to, or egress from, buildings or facilities where accessibility is required for applications listed in Section 1.9.1 regulated by the Division of the State Architect-Access Compliance, shall also comply with Chapter 11A or Chapter 11B, Section 11B-403, as applicable.*

**1017.1 General.** Aisles and aisle accessways serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles or aisle accessways shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. The required width of aisles shall be unobstructed.

**Exception:** Encroachments complying with Section 1005.7.

**1017.2 Aisles in assembly spaces.** Aisles and aisle accessways serving a room or space used for assembly purposes shall comply with Section 1028.

**1017.3 Aisles in Groups B and M.** In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

**Exception:** Nonpublic aisles serving less than 50 people and not required to be accessible by Chapter 11B, (see Section 11B-403) need not exceed 28 inches (711 mm) in width.

**1017.4 Aisle accessways in Group M.** An aisle accessway shall be provided on at least one side of each element within

the merchandise pad. The minimum clear width for an aisle accessway not required to be accessible shall be 30 inches (762 mm). The required clear width of the aisle accessway shall be measured perpendicular to the elements and merchandise within the merchandise pad. The 30-inch (762 mm) minimum clear width shall be maintained to provide a path to an adjacent aisle or aisle accessway. The common path of egress travel shall not exceed 30 feet (9144 mm) from any point in the merchandise pad.

**Exception:** For areas serving not more than 50 occupants, the common path of egress travel shall not exceed 75 feet (22 860 mm).

**1017.5 Aisles in other than assembly spaces and Groups B and M.** In other than rooms or spaces used for assembly purposes and Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

## SECTION 1018 CORRIDORS

**1018.1 Construction.** Corridors shall be fire-resistance rated in accordance with Table 1018.1. The corridor walls required to be fire-resistance rated shall comply with Section 708 for fire partitions.

**Exceptions:**

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door opening directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.
5. Corridors adjacent to the exterior walls of buildings shall be permitted to have unprotected openings on unrated exterior walls where unrated walls are permitted by Table 602 and unprotected openings are permitted by Table 705.8.
6. A fire-resistance rating is not required for corridors within suites in a Group I-2 or I-2.1 occupancy provided with an automatic sprinkler system throughout and constructed in accordance with Section 407.4.3.5 or 407.4.3.6.

**TABLE 1018.1  
CORRIDOR FIRE-RESISTANCE RATING**

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system <sup>c</sup>
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5, L	Greater than 30	Not Permitted	1
A <sup>d</sup> , B, F, M, S, U	Greater than 30	1	0
R-1, R-2, R-3, R-3.1, R-4	Greater than 10	Not Permitted	1
I-2 <sup>a</sup> , I-2.1, I-4	<i>Greater than 6</i>	Not Permitted	1
I-3, R-2.1	<i>Greater than 6</i>	Not Permitted	1 <sup>b</sup>
E	<i>Greater than 10</i>	1	1

- a. For requirements for occupancies in Group I-2 and I-2.1, see Sections 407.2 and 407.3.
- b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Sections 408.1.2 and 408.8.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.
- d. [SFM] See Section 1028.

**1018.2 Width.** The minimum width of corridors specified in Table 1018.2 shall be as determined in Section 1005.1.

**TABLE 1018.2  
MINIMUM CORRIDOR WIDTH**

OCCUPANCY	WIDTH (minimum)
Any facilities not listed below	44 inches
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24 inches
With a required occupancy capacity less than 50	36 inches
Within a dwelling unit	36 inches
In Group E with a corridor having a required capacity of 100 or more	72 inches
In corridors and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be incapable of self-preservation	72 inches
Group I-2 in areas where required for bed movement	96 inches
<i>Corridors in Group I-2 and I-3 occupancies serving any area caring for one or more nonambulatory persons.</i>	96 inches

For SI: 1 inch = 25.4 mm.

**1018.3 Obstruction.** The required width of corridors shall be unobstructed.

**Exception:** Encroachments complying with Section 1005.7.

**1018.4 Dead ends.** Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length.

**Exceptions:**

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.5), the dead end in a corridor shall not exceed 50 feet (15 240 mm).

2. In occupancies in Groups B, E, F, M, R-1, R-2, R-2.1, R-4, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet (15 240 mm).

3. A dead-end corridor shall not be limited in length where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor.

**1018.5 Air movement in corridors.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

**Exceptions:**

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m<sup>2</sup>) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.
5. *For health care facilities under the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD), see the California Mechanical Code.*

**1018.5.1 Corridor ceiling.** Use of the space between the corridor ceiling and the floor or roof structure above as a return air plenum is permitted for one or more of the following conditions:

1. The corridor is not required to be of fire-resistance-rated construction;
2. The corridor is separated from the plenum by fire-resistance-rated construction;
3. The air-handling system serving the corridor is shut down upon activation of the air-handling unit smoke detectors required by the *California Mechanical Code*;
4. The air-handling system serving the corridor is shut down upon detection of sprinkler waterflow where the building is equipped throughout with an automatic sprinkler system; or
5. The space between the corridor ceiling and the floor or roof structure above the corridor is used as a component of an approved engineered smoke control system.

**1018.6 Corridor continuity.** Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated corridor to the exit includes travel along unenclosed exit access stairways or ramps, the fire resistance-rating shall be continuous for the length of the stairway or ramp and for the length of the connecting corridor on the adjacent floor leading to the exit.

**Exceptions:**

1. Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.
2. *[SFM] In fully sprinklered office buildings, corridors may lead through enclosed elevator lobbies if all areas of the building have access to at least one required exit without passing through the elevator lobby.*

## SECTION 1019 EGRESS BALCONIES

**1019.1 General.** Balconies used for egress purposes shall conform to the same requirements as corridors for width, headroom, dead ends and projections.

**1019.2 Wall separation.** Exterior egress balconies shall be separated from the interior of the building by walls and opening protectives as required for corridors.

**Exception:** Separation is not required where the exterior egress balcony is served by at least two stairs and a dead-end travel condition does not require travel past an unprotected opening to reach a stair.

**1019.3 Openness.** The long side of an egress balcony shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

**1019.4 Location.** Exterior egress balconies shall have a minimum fire separation distance of 10 feet (3048 mm) measured from the exterior edge of the egress balcony to adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

## SECTION 1020 EXITS

**1020.1 General.** Exits shall comply with Sections 1020 through 1026 and the applicable requirements of Sections 1003 through 1013. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.

**1020.2 Exterior exit doors.** Buildings or structures used for human occupancy shall have at least one exterior door that meets the requirements of Section 1008.1.1.

**1020.2.1 Detailed requirements.** Exterior exit doors shall comply with the applicable requirements of Section 1008.1.

**1020.2.2 Arrangement.** Exterior exit doors shall lead directly to the exit discharge or the public way.

## SECTION 1021 NUMBER OF EXITS

**1021.1 General.** Each story and occupied roof shall have the minimum number of *independent exits*, or access to exits, as specified in Table 1021.1. *A single exit or access to a single exit shall be permitted in accordance with Section 1021.2.* The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at grade or a public way.

**1021.2 Single Exits.** *A single exit or access to a single exit shall be permitted* from any story or occupied roof, provided one of the following conditions exists:

1. The occupant load, number of dwelling units and exit access travel distance does not exceed the values in Table 1021.2(1) or 1021.2(2).
2. Rooms, areas and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit or access to a single exit.
3. Group R-3 occupancy buildings shall be permitted to have one exit where each individual story complies with Table 1021.2(1).
4. Parking garages where vehicles are mechanically parked shall be permitted to have one exit or access to a single exit.
5. Group R-3 and R-4 congregate residences shall be permitted to have one exit where each individual story complies with Table 1021.2(1) or 1021.2(2).
6. Individual single-story or multistory dwelling units shall be permitted to have a single exit or access to a single exit from the dwelling unit provided that all of the following criteria are met:
  - 6.1. The dwelling unit complies with Section 1015.1 as a space with one means of egress and
  - 6.2. Either the exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less than two approved independent exits.

TABLE 1021.1  
MINIMUM NUMBER OF EXITS  
OR ACCESS TO EXITS PER STORY

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

**1021.2.1 Mixed occupancies.** Where one exit, or exit access stairway or ramp providing access to exits at other stories, is permitted to serve individual stories, mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2(1) or Table 1021.2(2) for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be con-

sidered in accordance with the provisions of Section 1004.1. In each story of a mixed occupancy building, the maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants indicated in Table 1021.2(2) for each occupancy does not exceed one. *Where dwelling units are located on a story with other occupancies, the actual number of dwelling units divided by four plus the ratio from the other occupancy does not exceed one.*

**1021.2.2 Exits from specific space.** Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:

1. The number of exits from the entire story complies with Section 1021.1 and 1021.4.1;
2. The access to exits from each individual space in the story complies with Section 1015.1; and
3. All spaces within each portion of a story shall have access to the minimum number of approved independent exits based on the occupant load of that portion of the story but not less than two exits.

**1021.3 Vehicular ramps.** Vehicular ramps shall not be considered as an exit access ramp unless pedestrian facilities are provided.

## SECTION 1022 INTERIOR EXIT STAIRWAYS AND RAMPS

**1022.1 General.** Interior exit stairways and interior exit ramps serving as an exit component in a means of egress system shall comply with the requirements of this section. Interior exit stairways and ramps shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An interior exit stairway or ramp shall not be used for any purpose other than as a means of egress.

**1022.2 Construction.** Enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps shall include any basements, but not any mezzanines. Interior exit stairways and ramps shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

### Exceptions:

1. Interior exit stairways and ramps in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.

2. Fixed guideway transit stations, constructed in accordance with Section 433.

**1022.3 Termination.** Interior exit stairways and ramps shall terminate at an exit discharge or a public way.

**Exception:** Interior exit stairways and ramps shall be permitted to terminate at an exit passageway complying with Section 1023, provided the exit passageway terminates at an exit discharge or a public way.

**1022.3.1 Extension.** Where interior exit stairways and ramps are extended to an exit discharge or a public way by an exit passageway, the interior exit stairway and ramp shall be separated from the exit passageway by a fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both. The fire-resistance rating shall be at least equal to that required for the interior exit stairway and ramp. A fire door assembly complying with Section 716.5 shall be installed in the fire barrier to provide a means of egress from the interior exit stairway and ramp to the exit passageway. Openings in the fire barrier other than the fire door assembly are prohibited. Penetrations of the fire barrier are prohibited.

**Exception:** Penetrations of the fire barrier in accordance with Section 1022.5 shall be permitted.

**1022.4 Openings.** Interior exit stairway and ramp opening protectives shall be in accordance with the requirements of Section 716.

Openings in interior exit stairways and ramps other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

Elevators shall not open into interior exit stairways and ramps.

**1022.5 Penetrations.** Penetrations into and openings through interior exit stairways and ramps are prohibited except for required exit doors, equipment and ductwork necessary for independent ventilation or pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the interior exit stairway and ramp and terminating at a steel box not exceeding 16 square inches ( $0.010\text{ m}^2$ ). Such penetrations shall be protected in accordance with Section 714. There shall be no penetrations or communicating openings, whether protected or not, between adjacent interior exit stairways and ramps.

**Exception:** Membrane penetrations shall be permitted on the outside of the interior exit stairway and ramp. Such penetrations shall be protected in accordance with Section 714.3.2.

**1022.6 Ventilation.** Equipment and ductwork for interior exit stairway and ramp ventilation as permitted by Section 1022.5 shall comply with one of the following items:

1. Such equipment and ductwork shall be located exterior to the building and shall be directly connected to the

**TABLE 1021.2(1) (CFC [B] TABLE 1021.2(1))  
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2, R-3 OCCUPANCIES**

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story <i>above grade plane</i>	R-2 <sup>a,b</sup> R-3 <sup>a</sup>	4 dwelling units NA	125 feet NA
Fourth story <i>above grade plane</i> and higher above	R-3 <sup>a</sup>	NA	125 feet

For SI: 1 foot = 304.8 mm.

NP – Not Permitted

NA – Not Applicable

a. Buildings classified as Group R-2 or R-3 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.

b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1021.2(2).

**TABLE 1021.2(2)  
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES**

STORY	OCCUPANCY	MAXIMUM OCCUPANTS PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story <i>above or below grade plane</i> basement	A, B <sup>b</sup> , E, F <sup>b</sup> , M, U, S <sup>b</sup>	49 occupants	75 feet
	H-2, H-3	3 occupants	25 feet
	H-4, H-5, I, R-1, R-2 <sup>a,c</sup> , R-4	10 occupants	75 feet
	I-2, I-2.I	7 occupants	50 feet
	S	29 occupants	100 feet
Second story <i>above grade plane</i>	B, F, M, S	29 occupants	75 feet
Third story <i>above grade plane</i> and above higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP – Not Permitted

NA – Not Applicable

a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.

b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.

c. This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1021.2(1).

interior exit stairway and ramp by ductwork enclosed in construction as required for shafts.

2. Where such equipment and ductwork is located within the interior exit stairway and ramp, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, such equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 716 for shaft enclosures.

The interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

**1022.7 Interior exit stairway and ramp exterior walls.** Exterior walls of the interior exit stairway and ramp shall comply with the requirements of Section 705 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the stairway and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or to the roof line, whichever is lower.

**1022.8 Discharge identification.** An interior exit stairway and ramp shall not continue below its level of exit discharge unless an approved barrier is provided at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be provided as specified in Section 1011.

**1022.9 Stairway identification signs.** A sign shall be provided at each floor landing in an interior exit stairway and ramp connecting more than three stories designating the floor level, the terminus of the top and bottom of the interior exit stairway and ramp and the identification of the stair or ramp. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the interior exit stairway and ramp for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions.

*In addition to the stairway identification sign, raised characters and braille floor identification signs that comply with Chapter 11A, Section 1143A or Chapter 11B, Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5 shall be located at the landing of each floor level, placed adjacent to the door on the latch side, in all enclosed stairways in buildings two or more stories in height to identify the floor level. At the exit discharge level, the sign shall include a raised five pointed star located to the left of the identifying floor level. The outside diameter of the star shall be the same as the height of the raised characters.*

**1022.9.1 Signage requirements.** Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the stair enclosure, such as *STAIR NO. 1* or *WEST STAIR*, shall be placed at the top of the sign and shall be a minimum of  $1\frac{1}{2}$  inches (38 mm) in height block lettering with  $\frac{1}{4}$ -inch (6 mm) strokes.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height with  $\frac{3}{4}$ -inch (19 mm) strokes and located in the center of the sign. The mezzanine levels shall have the letter "M" preceding the floor level. Basement levels shall have the letter "B" preceding the floor number.
4. All other lettering and numbers shall be a minimum of 1 inch (25 mm) in height.
5. The stairway's upper terminus, such as *ROOF ACCESS* or *NO ROOF ACCESS*, shall be placed under the stairway identification in 1-inch-high (25 mm) block lettering with  $\frac{1}{4}$ -inch (6 mm) strokes.
6. The lower and upper terminus of the stairway shall be placed at the bottom of the sign in 1-inch-high (25 mm) block lettering with  $\frac{1}{4}$ -inch (6 mm) strokes.
7. Characters and their background shall have a non-glare finish. Characters shall contrast with their background, with either light characters on a dark

background or dark characters on a light background.

8. When signs required by Section 1022.9 are installed in interior exit stairways and ramps of buildings subject to Section 1024, the signs shall be made of the same materials as required by Section 1024.4.

**1022.10 Smokeproof enclosures.** Where required by Section 403.5.4 or 405.7.2, interior exit stairways and ramps shall be smokeproof enclosures in accordance with Section 909.20.

**1022.10.1 Termination and extension.** A smokeproof enclosure shall terminate at an exit discharge or a public way. The smokeproof enclosure shall be permitted to be extended by an exit passageway in accordance with Section 1022.3. The exit passageway shall be without openings other than the fire door assembly required by Section 1022.3.1 and those necessary for egress from the exit passageway. The exit passageway shall be separated from the remainder of the building by 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**Exceptions:**

1. Openings in the exit passageway serving a smokeproof enclosure are permitted where the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure, and openings are protected as required for access from other floors.
2. The fire barrier separating the smokeproof enclosure from the exit passageway is not required, provided the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure.
3. A smokeproof enclosure shall be permitted to egress through areas on the level of exit discharge or vestibules as permitted by Section 1027.

**1022.10.2 Enclosure access.** Access to the stairway within a smokeproof enclosure shall be by way of a vestibule or an open exterior balcony.

## SECTION 1023 EXIT PASSAGEWAYS

**1023.1 Exit passageway.** Exit passageways serving as an exit component in a means of egress system shall comply with the requirements of this section. An exit passageway shall not be used for any purpose other than as a means of egress.

**1023.2 Width.** The minimum width of exit passageways shall be determined as specified in Section 1005.1 but such width shall not be less than 44 inches (1118 mm), except that exit passageways serving an occupant load of less than 50 shall not be less than 36 inches (914 mm) in width. The required width of exit passageways shall be unobstructed.

**Exception:** Encroachment complying with Section 1005.7. <

*The clear width of exit passageways in a Group I-2 occupancy used for the movement of beds and litters shall be 44-inch (1118) minimum.*

**1023.3 Construction.** Exit passageway enclosures shall have walls, floors and ceilings of not less than a 1-hour fire-resistance rating, and not less than that required for any connecting interior exit stairway or ramp. Exit passageways shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both.

**1023.4 Termination.** Exit passageways on the level of exit discharge shall terminate at an exit discharge. Exit passageways on other levels shall terminate at an exit.

**1023.5 Openings and penetrations.** Exit passageway opening protectives shall be in accordance with the requirements of Section 716.

Except as permitted in Section 402.8.7, openings in exit passageways other than exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where an interior exit stairway or ramp is extended to an exit discharge or a public way by an exit passageway, the exit passageway shall also comply with Section 1022.3.1.

Elevators shall not open into an exit passageway.

**1023.6 Penetrations.** Penetrations into and openings through an exit passageway are prohibited except for required exit doors, equipment and ductwork necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and electrical raceway serving the exit passageway and terminating at a steel box not exceeding 16 square inches (0.010m<sup>2</sup>). Such penetrations shall be protected in accordance with Section 714. There shall be no penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

**Exception:** Membrane penetrations shall be permitted on the outside of the exit passageway. Such penetrations shall be protected in accordance with Section 714.3.2.

## SECTION 1024 LUMINOUS EGRESS PATH MARKINGS

**1024.1 General.** Approved luminous egress path markings delineating the exit path shall be provided in high-rise buildings of Group A, B, E, I, M, and R-1 occupancies in accordance with Sections 1024.1 through 1024.5.

**Exception:** Luminous egress path markings shall not be required on the level of exit discharge in lobbies that serve as part of the exit path in accordance with Section 1027.1, Exception 1.

**1024.2 Markings within exit components.** Egress path markings shall be provided in interior exit stairways, interior exit ramps and exit passageways, in accordance with Sections 1024.2.1 through 1024.2.6.

**1024.2.1 Steps.** A solid and continuous stripe shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining

stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of  $\frac{1}{2}$  inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than  $\frac{1}{2}$  inch (13 mm) down the vertical face of the step.

**Exception:** The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

**1024.2.2 Landings.** The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.

**1024.2.3 Handrails.** All handrails and handrail extensions shall be marked with a solid and continuous stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

**Exception:** The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

**1024.2.4 Perimeter demarcation lines.** Stair landings and other floor areas within interior exit stairways, interior exit ramps and exit passageways, with the exception of the sides of steps, shall be provided with solid and continuous demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 to 2 inches (25 mm to 51 mm) wide with interruptions not exceeding 4 inches (102 mm).

**Exception:** The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

**1024.2.4.1 Floor mounted demarcation lines.** Perimeter demarcation lines shall be placed within 4 inches (102 mm) of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

**Exception:** Demarcation lines shall not extend in front of exit discharge doors that lead out of an exit and through which occupants must travel to complete the exit path.

**1024.2.4.2 Wall mounted demarcation lines.** Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door,

demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such door.

**Exception:** Demarcation lines shall not extend in front of exit discharge doors that lead out of an exit and through which occupants must travel to complete the exit path.

**1024.2.4.3 Transition.** Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.

**1024.2.5 Obstacles.** Obstacles at or below 6 feet 6 inches (1981 mm) in height and projecting more than 4 inches (102 mm) into the egress path shall be outlined with markings no less than 1 inch (25 mm) in width comprised of a pattern of alternating equal bands, of luminescent luminous material and black, with the alternating bands no more than 2 inches (51 mm) thick and angled at 45 degrees. Obstacles shall include, but are not limited to, standpipes, hose cabinets, wall projections, and restricted height areas. However, such markings shall not conceal any required information or indicators including but not limited to instructions to occupants for the use of standpipes.

**1024.2.6 Doors within the exit path.** Doors through which occupants must pass in order to complete the exit path shall be provided with markings complying with Sections 1024.2.6.1 through 1024.2.6.3.

**1024.2.6.1 Emergency exit symbol.** The doors shall be identified by a low-location luminous emergency exit symbol complying with NFPA 170. The exit symbol shall be a minimum of 4 inches (102 mm) in height and shall be mounted on the door, centered horizontally, with the top of the symbol no higher than 18 inches (457 mm) above the finished floor.

**1024.2.6.2 Door hardware markings.** Door hardware shall be marked with no less than 16 square inches (406 mm<sup>2</sup>) of luminous material. This marking shall be located behind, immediately adjacent to, or on the door handle or escutcheon. Where a panic bar is installed, such material shall be no less than 1 inch (25 mm) wide for the entire length of the actuating bar or touchpad.

**1024.2.6.3 Door frame markings.** The top and sides of the door frame shall be marked with a solid and continuous 1-inch- to 2-inch-wide (25 mm to 51 mm) stripe. Where the door molding does not provide sufficient flat surface on which to locate the stripe, the stripe shall be permitted to be located on the wall surrounding the frame.

**1024.3 Uniformity.** Placement and dimensions of markings shall be consistent and uniform throughout the same enclosure.

**1024.4 Self-luminous and photoluminescent.** Luminous egress path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is

not required to maintain the required luminance. Such materials shall include, but not be limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994; or
2. ASTM E 2072, except that the charging source shall be 1 footcandle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 milicandelas per square meter at 10 minutes and 5 milicandelas per square meter after 90 minutes.

**1024.5 Illumination.** Where photoluminescent exit path markings are installed, they shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

## SECTION 1025 HORIZONTAL EXITS

**1025.1 Horizontal exits.** Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit width shall be horizontal exits.

### Exceptions:

1. Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. At least 6 square feet (0.6 m<sup>2</sup>) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

**1025.2 Separation.** The separation between buildings or refuge areas connected by a horizontal exit shall be provided by a fire wall complying with Section 706; or it shall be provided by a fire barrier complying with Section 707 or a horizontal assembly complying with Section 711, or both. The minimum fire-resistance rating of the separation shall be 2 hours. Opening protectives in horizontal exits shall also comply with Section 716. Duct and air transfer openings in a fire wall or fire barrier that serves as a horizontal exit shall also comply with Section 717. The horizontal exit separation shall extend vertically through all levels of the building unless floor assemblies have a fire-resistance rating of not less than 2 hours with no unprotected openings.

**Exception:** A fire-resistance rating is not required at horizontal exits between a building area and an above-grade pedestrian walkway constructed in accordance with Section 3104, provided that the distance between connected buildings is more than 20 feet (6096 mm).

Horizontal exits constructed as fire barriers shall be continuous from exterior wall to exterior wall so as to divide completely the floor served by the horizontal exit.

**1025.3 Opening protectives.** Fire doors in horizontal exits shall be self-closing or automatic-closing when activated by a smoke detector in accordance with Section 716.5.9.3. Doors, where located in a cross-corridor condition, shall be automatic-closing by activation of a smoke detector installed in accordance with Section 716.5.9.3.

**1025.4 Capacity of refuge area.** The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet ( $0.2787 \text{ m}^2$ ) for each occupant to be accommodated therein.

**Exception:** The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet ( $0.6 \text{ m}^2$ ) per occupant for occupancies in Group I-3.
2. Fifteen square feet ( $1.4 \text{ m}^2$ ) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet ( $2.8 \text{ m}^2$ ) per occupant for nonambulatory occupancies in Group I-2.

The refuge area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant load imposed by persons entering it through horizontal exits from other areas. *In other than I-3 occupancies*, at least one refuge area exit shall lead directly to the exterior or to an interior exit stairway or ramp.

**Exception:** The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads has stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

## SECTION 1026 EXTERIOR EXIT STAIRWAYS AND RAMPS

**1026.1 Exterior exit stairways and ramps.** Exterior exit stairways and ramps serving as an element of a required means of egress shall comply with this section.

**1026.2 Use in a means of egress.** Exterior exit stairways shall not be used as an element of a required means of egress for Group I-2 occupancies. For occupancies in other than Group I-2, exterior exit stairways and ramps shall be permitted as an element of a required means of egress for buildings not exceeding six stories above grade plane or which are not high-rise buildings.

**1026.3 Open side.** Exterior exit stairways and ramps serving as an element of a required means of egress shall be open on at least one side. An open side shall have a minimum of 35

square feet ( $3.3 \text{ m}^2$ ) of aggregate open area adjacent to each floor level and the level of each intermediate landing. The required open area shall be located not less than 42 inches (1067 mm) above the adjacent floor or landing level.

**1026.4 Side yards.** The open areas adjoining exterior exit stairways or ramps shall be either yards, courts or public ways; the remaining sides are permitted to be enclosed by the exterior walls of the building.

**1026.5 Location.** Exterior exit stairways and ramps shall have a minimum fire separation distance of 10 feet (3048 mm) measured from the exterior edge of the stairway or ramp, including landings, to adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

**1026.6 Exterior stairway and ramp protection.** Exterior exit stairways and ramps shall be separated from the interior of the building as required in Section 1022.2. Openings shall be limited to those necessary for egress from normally occupied spaces.

### Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior stairway or ramp is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway or ramp located in a building or structure that is permitted to have unenclosed exit access stairways in accordance with Section 1009.3.
4. Separation from the interior of the building is not required for exterior stairways or ramps connected to open-ended corridors, provided that Items 4.1 through 4.5 are met:
  - 4.1. The building, including corridors, stairways or ramps, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
  - 4.2. The open-ended corridors comply with Section 1018.
  - 4.3. The open-ended corridors are connected on each end to an exterior exit stairway or ramp complying with Section 1026.

- 4.4. The exterior walls and openings adjacent to the exterior exit stairway or ramp comply with Section 1022.7.
- 4.5. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet ( $3.3 \text{ m}^2$ ) or an exterior stairway or ramp shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

## SECTION 1027 EXIT DISCHARGE

**1027.1 General.** Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide a direct path of egress travel to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and capacity of the required exits.

### Exceptions:

- 1. A maximum of 50 percent of the number and capacity of interior exit stairways and ramps is permitted to egress through areas on the level of exit discharge provided all of the following are met:
  - 1.1. Such enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.
  - 1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
  - 1.3. The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.
- 2. A maximum of 50 percent of the number and capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided all of the following are met:
  - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.

- 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
- 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
- 2.4. The area is used only for means of egress and exits directly to the outside.
- 3. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

**1027.2 Exit discharge capacity.** The capacity of the exit discharge shall be not less than the required discharge capacity of the exits being served.

**1027.3 Exit discharge components.** Exit discharge components shall be sufficiently open to the exterior so as to minimize the accumulation of smoke and toxic gases.

**1027.4 Egress courts.** Egress courts serving as a portion of the exit discharge in the means of egress system shall comply with the requirements of Section 1027.

**1027.4.1 Width.** The minimum width of egress courts shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall not be less than 36 inches (914 mm) in width. The required width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

**Exception:** Encroachments complying with Section 1005.7.

Where an egress court exceeds the minimum required width and the width of such egress court is then reduced along the path of exit travel, the reduction in width shall be gradual. The transition in width shall be affected by a guard not less than 36 inches (914 mm) in height and shall not create an angle of more than 30 degrees (0.52 rad) with respect to the axis of the egress court along the path of egress travel. In no case shall the width of the egress court be less than the required minimum.

**1027.4.2 Construction and openings.** Where an egress court serving a building or portion thereof is less than 10 feet (3048 mm) in width, the egress court walls shall have not less than 1-hour fire-resistance-rated construction for a distance of 10 feet (3048 mm) above the floor of the court. Openings within such walls shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour.

### Exceptions:

- 1. Egress courts serving an occupant load of less than 10.
- 2. Egress courts serving Group R-3.

**1027.5 Access to a public way.** The exit discharge shall provide a direct and unobstructed access to a public way.

**Exception:** Where access to a public way cannot be provided, a safe dispersal area shall be provided where all of the following are met:

1. The area shall be of a size to accommodate at least 5 square feet ( $0.46 \text{ m}^2$ ) for each person.
2. *For other than Group E buildings*, the area shall be located on the same lot at least 50 feet (15 240 mm) away from the building requiring egress. *For Group E buildings, the area shall be located on the same lot at least 50 feet (15 240 mm) away from any building.*
3. The area shall be permanently maintained and identified as a safe dispersal area.
4. The area shall be provided with a safe and unobstructed path of travel from the building.

## SECTION 1028 ASSEMBLY

**1028.1 General.** A room or space used for assembly purposes which contains seats, tables, displays, equipment or other material shall comply with this section.

**Exception:** Group A occupancies within Group I-3 facilities are exempt from egress requirements of 1028.

**1028.1.1 Bleachers.** Bleachers, grandstands and folding and telescopic seating, that are not building elements, shall comply with ICC 300.

**1028.1.1.1 Spaces under grandstands and bleachers.** When spaces under grandstands or bleachers are used for purposes other than ticket booths less than 100 square feet ( $9.29 \text{ m}^2$ ) and toilet rooms, such spaces shall be separated by fire barriers complying with Section 707 and horizontal assemblies complying with Section 711 with not less than 1-hour fire-resistance-rated construction.

**1028.2 Assembly main exit.** In a building, room or space used for assembly purposes that has an occupant load of greater than 300 and is provided with a main exit, the main exit shall be of sufficient width to accommodate not less than one-half of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on at least one street or an unoccupied space of not less than 20 feet (6096 mm) in width that adjoins a street or public way. In a building, room or space used for assembly purposes where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width *and at least one exit shall discharge on a street or an unoccupied space of not less than 20 feet (6096 mm) in width that adjoins a street or public way. Smoke-protected seating shall comply with Section 1028.6.2..*

**1028.3 Assembly other exits.** In addition to having access to a main exit, each level in a building used for assembly purposes having an occupant load greater than 300 and provided with a main exit, shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and shall comply with Section 1015.2. *At least one-half of the additional means of egress required by this section shall be directly to an exit, or through a lobby, that is not used to access the main exit, to an exit, or to a one hour rated corridor to an exit.* In a building used for assembly purposes where there is no well-defined main exit or where multiple main exits are provided, exits for each level shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width *and at least one exit shall discharge on a street or an unoccupied space of not less than 20 feet (6096 mm) in width that adjoins a street or public way. Smoke-protected seating shall comply with Section 1028.6.2.*

**1028.3.1 Occupant loads 300 or less.** Group A occupancies or assembly occupancies accessory to Group E occupancies that have an occupant load of 100 or more and 300 or less, shall have at least one of the required means of egress directly to an exit, or through a lobby, that is not used to access the other required exit, to an exit, or to a one-hour rated corridor to an exit or continuous through a one-hour rated lobby to an exit. At least one exit shall discharge on a street or an unoccupied space of not less than 20 feet (6096 mm) in width that adjoins a street or public way.

**1028.4 Foyers and lobbies.** In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available, such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the required clear width of the means of egress. Such foyer, if not directly connected to a public street by all the main entrances or exits, shall have a straight and unobstructed corridor or path of travel to every such main entrance or exit.

**1028.5 Interior balcony and gallery means of egress.** For balconies, galleries or press boxes having a seating capacity of 50 or more located in a building, room or space used for assembly purposes, at least two means of egress shall be provided, with one from each side of every balcony, gallery or press box and at least one leading directly to an exit.

**1028.6 Width of means of egress for assembly.** The clear width of aisles and other means of egress shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

**1028.6.1 Without smoke protection.** The clear width of the means of egress shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on stairs having riser heights 7 inches (178 mm) or less and tread depths

- 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.127 mm) of additional stair width for each occupant shall be provided for each 0.10 inch (2.5 mm) of riser height above 7 inches (178 mm).
  3. Where egress requires stair descent, at least 0.075 inch (1.9 mm) of additional width for each occupant shall be provided on those portions of stair width having no handrail within a horizontal distance of 30 inches (762 mm).
  4. Ramped means of egress, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of clear width for each occupant served. Level or ramped means of egress, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.

**1028.6.2 Smoke-protected seating.** The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating.

**Exception:** For an outdoor smoke-protected assembly seating with an occupant load not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

**1028.6.2.1 Smoke control.** Means of egress serving a smoke-protected assembly seating area shall be provided with a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the means of egress.

**1028.6.2.2 Roof height.** A smoke-protected assembly seating area with a roof shall have the lowest portion of

the roof deck not less than 15 feet (4572 mm) above the highest aisle or aisle accessway.

**Exception:** A roof canopy in an outdoor stadium shall be permitted to be less than 15 feet (4572 mm) above the highest aisle or aisle accessway provided that there are no objects less than 80 inches (2032 mm) above the highest aisle or aisle accessway.

**1028.6.2.3 Automatic sprinklers.** Enclosed areas with walls and ceilings in buildings or structures containing smoke-protected assembly seating shall be protected with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

**Exceptions:**

1. The floor area used for contests, performances or entertainment provided the roof construction is more than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.
2. Press boxes and storage facilities less than 1,000 square feet ( $93\text{ m}^2$ ) in area.
3. Outdoor seating facilities where seating and the means of egress in the seating area are essentially open to the outside.

**1028.6.3 Width of means of egress for outdoor smoke-protected assembly seating.** The clear width in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by aisles and stairs and multiplied by 0.06 (1.52 mm) where egress is by ramps, corridors, tunnels or vomitories.

**Exception:** The clear width in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less width.

**1028.6.4 Public address system.** See Section 907.2.1.3.

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**1028.7 Travel distance.** Exits and aisles shall be so located that the travel distance to an exit door shall not be greater than 200 feet (60 960 mm) measured along the line of travel in nonsprinklered buildings. Travel distance shall not be more than 250 feet (76 200 mm) in sprinklered buildings. Where aisles are provided for seating, the distance shall be measured

**TABLE 1028.6.2**  
**WIDTH OF AISLES FOR SMOKE-PROTECTED ASSEMBLY**

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	Stairs and aisle steps with handrails within 30 inches	Stairs and aisle steps without handrails within 30 inches	Passageways, doorways and ramps not steeper than 1 in 10 in slope	Ramps steeper than 1 in 10 in slope
Equal to or less than 5,000	0.200	0.250	0.150	0.165
10,000	0.130	0.163	0.100	0.110
15,000	0.096	0.120	0.070	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.060	0.075	0.044	0.048

For SI: 1 inch = 25.4 mm.

along the aisles and aisle accessway without travel over or on the seats.

**Exceptions:**

1. Smoke-protected assembly seating: The travel distance from each seat to the nearest entrance to a vomitory or concourse shall not exceed 200 feet (60 960 mm). The travel distance from the entrance to the vomitory or concourse to a stair, ramp or walk on the exterior of the building shall not exceed 200 feet (60 960 mm).
2. Open-air seating: The travel distance from each seat to the building exterior shall not exceed 400 feet (122 m). The travel distance shall not be limited in facilities of Type I or II construction.

**1028.8 Common path of egress travel.** The common path of egress travel shall not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two exits.

**Exceptions:**

1. For areas serving less than 50 occupants, the common path of egress travel shall not exceed 75 feet (22 860 mm).
2. For smoke-protected assembly seating, the common path of egress travel shall not exceed 50 feet (15 240 mm).

**1028.8.1 Path through adjacent row.** Where one of the two paths of travel is across the aisle through a row of seats to another aisle, there shall be not more than 24 seats between the two aisles, and the minimum clear width between rows for the row between the two aisles shall be 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row between aisles.

**Exception:** For smoke-protected assembly seating there shall not be more than 40 seats between the two aisles and the minimum clear width shall be 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat.

**1028.9 Assembly aisles are required.** Every occupied portion of any building, room or space used for assembly purposes that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1028.10.1.

**1028.9.1 Minimum aisle width.** The minimum clear width for aisles shall be as shown:

1. Forty-eight inches (1219 mm) for aisle stairs having seating on each side.
  2. Thirty-six inches (914 mm) for aisle stairs having seating on only one side.
- Exception:** Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

**Exception:** Twenty-three inches (584 mm) between an aisle stair handrail and seating where

an aisle does not serve more than five rows on one side.

3. Twenty-three inches (584 mm) between an aisle stair handrail or guard and seating where the aisle is subdivided by a handrail.
4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

**Exceptions:**

1. Thirty-six inches (914 mm) where the aisle serves less than 50 seats.
2. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.
5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

**Exception:** Thirty inches (762 mm) where the aisle does not serve more than 14 seats.

*6. Libraries with open book stacks shall have main aisles not less than 44 inches (1118 mm) in width, and side, range and end aisles not less than 36 inches (914 mm) in width.*

**1028.9.2 Aisle width.** The aisle width shall provide sufficient egress capacity for the number of persons accommodated by the catchment area served by the aisle. The catchment area served by an aisle is that portion of the total space that is served by that section of the aisle. In establishing catchment areas, the assumption shall be made that there is a balanced use of all means of egress, with the number of persons in proportion to egress capacity.

**1028.9.3 Converging aisles.** Where aisles converge to form a single path of egress travel, the required egress capacity of that path shall not be less than the combined required capacity of the converging aisles.

**1028.9.4 Uniform width.** Those portions of aisles, where egress is possible in either of two directions, shall be uniform in required width.

**1028.9.5 Assembly aisle termination.** Each end of an aisle shall terminate at cross aisle, foyer, doorway, vomitory or concourse having access to an exit.

**Exceptions:**

1. Dead-end aisles shall not be greater than 20 feet (6096 mm) in length.
2. Dead-end aisles longer than 20 feet (6096 mm) are permitted where seats beyond the 20-foot (6096 mm) dead-end aisle are no more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row.
3. For smoke-protected assembly seating, the dead-end aisle length of vertical aisles shall not exceed a distance of 21 rows.
4. For smoke-protected assembly seating, a longer dead-end aisle is permitted where seats beyond

the 21-row dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row.

**1028.9.6 Assembly aisle obstructions.** There shall be no obstructions in the required width of aisles except for handrails as provided in Section 1028.13.

**1028.10 Aisle accessways.** Aisle accessways for seating at tables shall comply with Section 1028.10.1. Aisle accessways for seating in rows shall comply with Section 1028.10.2.

**1028.10.1 Seating at tables.** Where seating is located at a table or counter and is adjacent to an aisle or aisle accessway, the measurement of required clear width of the aisle or aisle accessway shall be made to a line 19 inches (483 mm) away from and parallel to the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisle or aisle accessways, the clear width shall be measured to walls, edges of seating and tread edges, except that handrail projections are permitted.

**Exception:** Where tables or counters are served by fixed seats, the width of the aisle accessway shall be measured from the back of the seat.

**1028.10.1.1 Aisle accessway width for seating at tables.** Aisle accessways serving arrangements of seating at tables or counters shall have sufficient clear width to conform to the capacity requirements of Section 1005.1 but shall not have less than a minimum of 12 inches (305 mm) of width plus  $\frac{1}{2}$  inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.

**Exception:** Portions of an aisle accessway having a length not exceeding 6 feet (1829 mm) and used by a total of not more than four persons.

**1028.10.1.2 Seating at table aisle accessway length.** The length of travel along the aisle accessway shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of egress travel to separate exits.

**1028.10.2 Clear width of aisle accessways serving seating in rows.** Where seating rows have 14 or fewer seats, the minimum clear aisle accessway width shall not be less than 12 inches (305 mm) measured as the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats, the measurement shall be made with seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurements shall be made with the seat in the down position. For seats with folding tablet arms, row spacing shall be determined with the tablet arm in the used position.

**Exception:** For seats with folding tablet arms, row spacing is permitted to be determined with the tablet arm in the stored position where the tablet arm when raised manually to vertical position in one motion automatically returns to the stored position by force of gravity.

**1028.10.2.1 Dual access.** For rows of seating served by aisles or doorways at both ends, there shall not be more than 100 seats per row. The minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.3 inch (7.6 mm) for every additional seat beyond 14 seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

**Exception:** For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1028.10.2.1.

**TABLE 1028.10.2.1**  
**SMOKE-PROTECTED ASSEMBLY AISLE ACCESSWAYS**

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY SEATING	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY	
	Aisle or doorway at both ends of row	Aisle or doorway at one end of row only
Less than 4,000	14	7
4,000	15	7
7,000	16	8
10,000	17	8
13,000	18	9
16,000	19	9
19,000	20	10
22,000 and greater	21	11

For SI: 1 inch = 25.4 mm.

**1028.10.2.2 Single access.** For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

**Exception:** For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1028.10.2.1.

**1028.11 Assembly aisle walking surfaces.** Aisles with a slope not exceeding one unit vertical in eight units horizontal (12.5-percent slope) shall consist of a ramp having a slip-resistant walking surface. Aisles with a slope exceeding one unit vertical in eight units horizontal (12.5-percent slope) shall consist of a series of risers and treads that extends across the full width of aisles and complies with Sections 1028.11.1 through 1028.11.3.

**1028.11.1 Treads.** Tread depths shall be a minimum of 11 inches (279 mm) and shall have dimensional uniformity.

**Exception:** The tolerance between adjacent treads shall not exceed  $\frac{3}{16}$  inch (4.8 mm).

**1028.11.2 Risers.** Where the gradient of aisle stairs is to be the same as the gradient of adjoining seating areas, the riser height shall not be less than 4 inches (102 mm) nor more than 8 inches (203 mm) and shall be uniform within each flight.

**Exceptions:**

1. Riser height nonuniformity shall be limited to the extent necessitated by changes in the gradient of the adjoining seating area to maintain adequate sightlines. Where nonuniformities exceed  $\frac{3}{16}$  inch (4.8 mm) between adjacent risers, the exact location of such nonuniformities shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide. The edge marking stripe shall be distinctively different from the contrasting marking stripe.
2. Riser heights not exceeding 9 inches (229 mm) shall be permitted where they are necessitated by the slope of the adjacent seating areas to maintain sightlines.

**1028.11.3 Tread contrasting marking stripe.** A contrasting marking stripe shall be provided on each tread at the nosing or leading edge such that the location of each tread is readily apparent when viewed in descent. Such stripe shall be a minimum of 1 inch (25 mm), and a maximum of 2 inches (51 mm), wide.

**Exception:** The contrasting marking stripe is permitted to be omitted where tread surfaces are such that the location of each tread is readily apparent when viewed in descent.

**1028.12 Seat stability.** In a building, room or space used for assembly purposes, the seats shall be securely fastened to the floor.

**Exceptions:**

1. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with 200 or fewer seats, the seats shall not be required to be fastened to the floor.
2. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating, the seats shall not be required to be fastened to the floor.
3. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with greater than 200 seats, the seats shall be fastened together in groups of not less than three or the seats shall be securely fastened to the floor.

4. In a building, room or space used for assembly purposes where flexibility of the seating arrangement is an integral part of the design and function of the space and seating is on tiered levels, a maximum of 200 seats shall not be required to be fastened to the floor. Plans showing seating, tiers and aisles shall be submitted for approval.

5. Groups of seats within a building, room or space used for assembly purposes separated from other seating by railings, guards, partial height walls or similar barriers with level floors and having no more than 14 seats per group shall not be required to be fastened to the floor.
6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.

**1028.13 Handrails.** Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails in compliance with Section 1012 located either at one or both sides of the aisle or within the aisle width.

**Exceptions:**

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stair and aisle ramp runs to permit crossovers within the aisles.

**1028.13.1 Discontinuous handrails.** Where there is seating on both sides of the aisle, the handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

**1028.13.2 Intermediate handrails.** Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

**1028.14 Assembly guards.** Guards adjacent to seating in a building, room or space used for assembly purposes shall comply with Sections 1028.14.1 through 1028.14.3.

**1028.14.1 Cross aisles.** Cross aisles located more than 30 inches (762 mm) above the floor or grade below shall have guards in accordance with Section 1013.

Where an elevation change of 30 inches (762 mm) or less occurs between a cross aisle and the adjacent floor or grade below, guards not less than 26 inches (660 mm) above the aisle floor shall be provided.

**Exception:** Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guard need not be provided.

**1028.14.2 Sightline-constrained guard heights.** Unless subject to the requirements of Section 1028.14.3, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or foot-board elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided where required by ICC 300.

**Exception:** The height of the guard in front of seating shall be measured from the adjacent walking surface.

**1028.14.3 Guards at the end of aisles.** A fascia or railing system complying with the guard requirements of Section 1013 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or grade below. The fascia or railing shall be a minimum of 36 inches (914 mm) high and shall provide a minimum 42 inches (1067 mm) measured diagonally between the top of the rail and the nosing of the nearest tread.

## SECTION 1029 EMERGENCY ESCAPE AND RESCUE

**1029.1 General.** In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue openings in Group R occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

### Exceptions:

1. In Groups R-1 and R-2 occupancies constructed of Type I, Type II-A, Type IIIA or Type IV construction equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1
2. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue openings.
3. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, court or exterior exit balcony that opens to a public way.
4. Basements without habitable spaces and having no more than 200 square feet ( $18.6 \text{ m}^2$ ) in floor area

shall not be required to have emergency escape and rescue openings.

**1029.2 Minimum size.** Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet ( $0.53 \text{ m}^2$ ).

**Exception:** The minimum net clear opening for grade-floor emergency escape and rescue openings shall be 5 square feet ( $0.46 \text{ m}^2$ ).

**1029.2.1 Minimum dimensions.** The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm). The net clear opening dimensions shall be the result of normal operation of the opening.

**1029.3 Maximum height from floor.** Emergency escape and rescue openings shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor.

**1029.4 Operational constraints.** Emergency escape and rescue openings and any exit doors shall be maintained free of any obstructions other than those allowed by this section and shall be operational from the inside of the room. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with Section 1029.2 and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or effort or force greater than that which is required for normal operation of the escape and rescue opening. Where such bars, grilles, grates or similar devices are installed, smoke alarms shall be installed in accordance with Section 907.2.11 regardless of the valuation of the alteration. The release mechanism shall be maintained operable at all times.

Such bars, grills, grates or any similar devices shall be equipped with an approved exterior release device for use by the fire department only when required by the authority having jurisdiction.

Where security bars (burglar bars) are installed on emergency egress and rescue windows or doors, on or after July 1, 2000, such devices shall comply with California Building Standards Code, Part 12, Chapter 12-3 and other applicable provisions of Part 2.

**Exception:** Group R-1 occupancies provided with a monitored fire sprinkler system in accordance with Section 903.2.8 and designed in accordance with NFPA 13 may have openable windows permanently restricted to a maximum 4-inch (102 mm) open position.

**1029.5 Window wells.** An emergency escape and rescue opening with a finished sill height below the adjacent ground level shall be provided with a window well in accordance with Sections 1029.5.1 and 1029.5.2.

**1029.5.1 Minimum size.** The minimum horizontal area of the window well shall be 9 square feet ( $0.84 \text{ m}^2$ ), with a minimum dimension of 36 inches (914 mm). The area of the window well shall allow the emergency escape and rescue opening to be fully opened.

**1029.5.2 Ladders or steps.** Window wells with a vertical depth of more than 44 inches (1118 mm) shall be equipped with an approved permanently affixed ladder or steps. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the window well. The ladder or steps shall not encroach into the required dimensions of the window well by more than 6 inches (152 mm). The ladder or steps shall not be obstructed by the emergency escape and rescue opening. Ladders or steps required by this section are exempt from the stairway requirements of Section 1009.



**CHAPTER 11**

**RESERVED**



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 11A – HOUSING ACCESSIBILITY

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
<i>Adopt entire chapter</i>			X	X	X															
<i>Adopt entire chapter as amended (amended sections listed below)</i>																				
<i>Adopt only those sections that are listed below</i>						X														
<i>Chapter / Section</i>																				
1102A.3.1, Exc.																				
1102A.2, Exc.																				
1118A.1																				
1128A							X													
1129A							X													
1130A							X													
1131A							X													
1132A							X													
1133A							X													
1134A							X													
1135A							X													
1136A							X													
1150A.1							X													



# **CHAPTER 11A**

## **HOUSING ACCESSIBILITY**

**NOTE 1:** Covered multifamily dwellings may be subject to the requirements of more than one jurisdiction or law, which would require compliance with each law. Where federal, state, or local laws differ, the more stringent requirements apply. For additional information, see the Joint Statement of the Department of Housing and Urban Development and the Department of Justice issued April 30, 2013 ([www.hud.gov](http://www.hud.gov)).

**NOTE 2:** Dwelling units constructed as senior citizen housing may also be subject to the Unruh Civil Rights Act. Refer to Division 1, Part 2 of the California Civil Code. For additional information regarding application, interpretation and enforcement, contact the California Department of Fair Employment and Housing.

### **Division I – APPLICATION, GENERAL PROVISIONS, AND DEFINITIONS**

#### **Division I Table of Contents**

- Section 1101A Application
- Section 1102A Building Accessibility
- Section 1103A Design and Construction
- Section 1104A Covered Multifamily Dwellings
- Section 1105A Garages, Carports and Parking Facilities
- Section 1106A Site and Building Characteristics
- Section 1107A Definitions

### **SECTION 1101A APPLICATION**

**1101A.1 Scope.** The application and authority of this chapter are identified and referenced in Sections 1.8.2.1.2 and 1102A for the Department of Housing and Community Development. Applicable sections are identified in the Matrix Adoption Tables of this code under the abbreviation HCD 1-AC. The provisions of this chapter shall apply to the following:

- 1. All newly-constructed covered multifamily dwellings.
- 2. New common use areas serving existing covered multifamily dwellings.
- 3. Additions to existing buildings, where the addition alone meets the definition of a covered multifamily dwelling.
- 4. New common-use areas serving new covered multifamily dwellings.
- 5. Where any portion of a building's exterior is preserved, but the interior of the building is removed, including all structural portions of floors and ceilings, the building is considered a new building for determining the application of this chapter.

Chapter 11A generally does not apply to public accommodations such as hotels and motels, and public housing. Public use areas, public accommodations, and public housing as defined in Chapter 2 of this code are subject to provisions of the Division of the State Architect (DSA-AC) in Chapter 11B, and are referenced in Section 1.9.1.

Newly constructed covered multifamily dwellings, which can also be defined as public housing, shall be subject to the requirements of Chapter 11A and Chapter 11B.

### **SECTION 1102A BUILDING ACCESSIBILITY**

**1102A.1 Where required.** Buildings or portions of buildings and facilities within the scope of this chapter shall be accessible to persons with disabilities. Each building on a building site shall be considered separately when determining the requirements contained in this chapter, except when calculating the number of units which must comply with Section 1102A.3.1. Dwelling units within a single structure separated by firewalls do not constitute separate buildings.

Newly-constructed covered multifamily dwellings as defined in this chapter, include, but are not limited to, the following:

- 1. Apartment buildings with 3 or more dwelling units including timeshare apartments not considered a place of public accommodation or transient lodging as defined in Health and Safety Code Section 19955 (a), and Chapter 2 of the California Building Code.
- 2. Condominiums with 4 or more dwelling units including timeshare condominiums not considered a place of public accommodation or transient lodging as defined in Health and Safety Code Section 19955 (a), and Chapter 2 of the California Building Code.
- 3. Lodging houses, as defined in Chapter 2 of the California Building Code, used as a residence with more than 3 but not more than 5 guest rooms.
- 4. Congregate residences, as defined in Chapter 2 of the California Building Code, with 3 or more sleeping units.
- 5. Dwellings with 3 or more efficiency units, as defined in Chapter 2 of this code, or Section 17958.1 of the California Health and Safety Code.
- 6. Shelters for homeless persons, not otherwise subject to the disabled access provisions of the Division of the State Architect-Access Compliance (DSA-AC).
- 7. Dormitories, as defined in Chapter 2 of this code, with 3 or more guest rooms as defined in Chapter 2 of the California Building Code.
- 8. Timeshare dwellings with 3 or more units, not considered a place of public accommodations or transient lodging as defined in Health and Safety Code Section 19955 (a), and Chapter 2 of the California Building Code.
- 9. Other Group R occupancies in covered multifamily dwellings which are regulated by the Office of the State Fire Marshal. See Section 1.11.

**10. Public housing as defined in Chapter 2 of this code is subject to provisions of the Division of the State Architect (DSA-AC) in Chapter 11B. Newly constructed covered multifamily dwellings, which can also be defined as public housing, shall be subject to the requirements of Chapter 11A and Chapter 11B.**

**1102A.2 Existing buildings.** The building standards contained in this chapter do not apply to the alteration, repair, rehabilitation or maintenance of multifamily dwellings constructed for first occupancy prior to March 13, 1991.

Covered multifamily dwellings shall be maintained in compliance with the accessibility standards in effect at the time of construction. Apartments constructed prior to March 13, 1991 shall be maintained in compliance with the accessibility standards in effect at the time of construction.

Additions shall be subject to the requirements of this chapter, provided the addition, when considered alone, meets the definition of a covered multifamily dwelling, as defined in Chapter 2. New common use spaces serving existing covered multifamily dwellings shall be subject to the requirements of this chapter.

**Note:** For all existing public use areas, public accommodations, and public housing, see Chapter 11B for provisions of the Division of the State Architect-Access Compliance (DSA-AC).

#### **1102A.3 Multistory dwellings.**

**1102A.3.1 Multistory apartment or condominium dwellings in buildings with no elevator.** This section shall apply to multistory dwelling units on the ground floor of buildings without elevators for which an application for a construction permit is submitted on or after July 1, 2005.

**Exception:** Carriage units as defined in Chapter 2 and regulated only by the Department of Housing and Community Development as referenced in Section 1.8.2.1.2.

At least 10 percent but not less than one of the multistory dwellings in apartment buildings with 3 or more dwelling units and/or condominiums with 4 or more dwelling units shall comply with the following:

1. The primary entry to the dwelling unit shall be on an accessible route unless exempted by site impracticality tests in Section 1150A.
2. At least one powder room or bathroom shall be located on the primary entry level, served by an accessible route and shall comply with the provisions in Division IV.
3. All rooms or spaces located on the primary entry level shall be served by an accessible route and shall comply with the provisions in Division IV. Rooms and spaces located on the primary entry level and subject to this chapter may include but are not limited to kitchens, powder rooms, bathrooms, living rooms, bedrooms or hallways.
4. Common use areas covered by this section shall be accessible as required by this chapter. Public use areas as defined in Chapter 2 of this code are sub-

ject to provisions of the Division of the State Architect (DSA-AC) and are referenced in Section 1.9.1.1.

The minimum number of multifamily dwelling units which must comply with this section shall be calculated using the total number of all multistory dwelling units in buildings on a site which are subject to this section. Any fraction thereof shall be rounded to the next highest whole number.

**1102A.3.2 Multistory dwelling units in buildings with one or more elevators.** Multistory dwelling units contained in buildings with elevators shall comply with this section. For multistory dwelling units in buildings with elevators, the story of the unit that is served by the building elevator is considered a ground floor and the primary entry floor to the unit and shall comply with the following:

1. At least 1 powder room or bathroom shall be located on the primary entry level.
2. At least 1 kitchen shall be located on the primary entry level.
3. All rooms or spaces located on the primary entry level shall be served by an accessible route and shall comply with Division IV.

**1102A.4 Temporary restrictions.** During periods of partial or restricted use of a building or facility, the entrances used for primary access shall be accessible to and usable by persons with disabilities.

### **SECTION 1103A DESIGN AND CONSTRUCTION**

**1103A.1 General.** When buildings are required to be accessible, they shall be designed and constructed as provided in this chapter.

### **SECTION 1104A COVERED MULTIFAMILY DWELLINGS**

**1104A.1 General.** All ground-floor dwelling units in nonelevator buildings shall be adaptable and on an accessible route, unless an accessible route is not required as determined by site impracticality provisions in Section 1150A. For buildings with elevators, see Section 1106A.

Multistory dwelling units shall comply with Section 1102A.3.

**1104A.2 Ground floors above grade.** Where the first floor containing dwelling units in a building is above grade, all units on that floor shall be served by an accessible route. This floor will be considered a ground floor and all dwelling units are considered covered multifamily dwelling units.

**Exception:** Carriage units as defined in Chapter 2 and regulated only by the Department of Housing and Community Development as referenced in Section 1.8.2.1.2.

Multistory dwelling units shall comply with Section 1102A.3.

## **SECTION 1105A GARAGES, CARPORTS AND PARKING FACILITIES**

**1105A.1 General.** Garages, carports and other parking facilities, which are accessory to covered multifamily dwelling units, shall be accessible as required in Section 1109A.

## **SECTION 1106A SITE AND BUILDING CHARACTERISTICS**

**1106A.1 General.** Covered multifamily dwellings with elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route, regardless of terrain or unusual characteristics of the site. Covered multifamily dwellings without elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route unless terrain or unusual characteristics of the site prevent an accessible route based on the conditions listed below:

1. **Accessible entrance.** Regardless of site considerations described in Section 1150A, an accessible entrance on an accessible route is required when there is an elevator connecting the parking area with the dwelling units on a ground floor. (In this case, those dwelling units on the ground floor served by an elevator, and at least one of each type of public- and common-use areas, would be subject to these requirements.)
2. **Elevator building.** When a building elevator or elevators are provided as a means of access to dwelling units other than dwelling units on a ground floor (see Section 1104A.2), the building is an elevator building. All dwelling units become covered multifamily dwellings in

that building. The elevator in that building must provide accessibility to all dwelling units in the building, regardless of the slope of the natural terrain. For multistory dwelling units in buildings with one or more elevators, see Section 1102A.3.2.

**Note:** Where a building elevator is provided only as means of creating an accessible route to covered multifamily dwelling units on a ground floor, the building is not considered to be an elevator building, only dwelling units located on the ground floor shall be required to comply with this chapter.

3. **Elevated walkway.** When an elevated walkway is planned between a building entrance and a vehicular or pedestrian arrival point, and the planned walkway has a slope no greater than 10 percent (1 unit vertical in 10 units horizontal), the floor being served by the elevated walkway becomes a ground floor and accessibility to all dwellings on that ground floor is required.

**Note:** Since the planned walkway meets the 10 percent slope criterion, it is required to provide an accessible route to the entrance, and the slope of the walkway must be reduced to 1 unit vertical in 12 units horizontal (8.33 percent slope) maximum.

**1106A.2 Site impracticality.** For tests to determine site impracticality due to terrain considerations in nonelevator buildings, see Section 1150A.

## **SECTION 1107A DEFINITIONS**

All definitions are located in Chapter 2.

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**SECTION 1108A  
GENERAL REQUIREMENTS FOR ACCESSIBLE  
PARKING AND EXTERIOR ROUTES OF TRAVEL**

**Note:** In addition to provisions of this division, exterior routes of travel that provide access to, or egress from, buildings for persons with disabilities shall also comply with Chapter 10.

**SECTION 1109A  
PARKING FACILITIES**

**1109A.1 Accessible parking required.** Each parking facility provided for covered multifamily dwellings and facilities (e.g., swimming pools, club houses, recreation areas and laundry rooms) that serve covered multifamily dwellings shall provide accessible parking as required by this section.

**1109A.2 Parking facilities.** Parking facilities shall include, but not be limited to, the following:

1. Garages
2. Private garages
3. Carports
4. Off-street parking (parking lots/spaces)

**1109A.2.1 Private garages.** Private garages accessory to covered multifamily dwelling units, shall be accessible as required in Section 1109A. Private garages include individual garages and multiple individual garages grouped together.

**Exception:** A private garage attached to and directly serving a single covered multifamily dwelling unit providing at least one of the following options:

1. A door leading directly from the covered dwelling unit, which immediately enters the garage. The door shall comply on both sides with Sections 1132A.3 through 1132A.9.
2. An accessible route of travel from the covered dwelling unit to an exterior door entering the garage. See Section 1132A.1 for requirements at both exit doors.
3. An accessible route of travel from the dwelling unit's primary entry door to the vehicular entrance at the garage. See Section 1132A.1 for requirements at the primary entry door.

**1109A.3 Required accessible parking spaces.** Accessible parking spaces shall be provided at a minimum rate of 2 percent of the covered multifamily dwelling units. At least one space of each type of parking facility shall be made accessible even if the total number exceeds 2 percent.

**1109A.4 Assigned accessible parking spaces.** When assigned parking spaces are provided for a resident or a group of residents, at least 2 percent of the assigned parking spaces serving covered multifamily dwelling units shall be accessible in each type of parking facility. At least one space of each type of parking facility shall be made accessible even if the total number exceeds 2 percent. When assigned parking is provided, signage as required by Section 1109A.8.8 shall not be required.

**1109A.5 Unassigned and visitor parking spaces.** When parking is provided for covered multifamily dwellings and is not assigned to a resident or a group of residents at least 5 percent of the parking spaces shall be accessible and provide access to grade-level entrances of covered multifamily dwellings and facilities (e.g., swimming pools, club houses, recreation areas, and laundry rooms) that serve covered multifamily dwellings. Accessible parking spaces shall be provided with signage as required by Section 1109A.8.8. Such signage shall not be blocked from view by a vehicle parked in the space.

**1109A.6 Requests for accessible parking spaces.** When assigned parking is provided, designated accessible parking for the dwelling unit shall be provided on request of residents with disabilities on the same terms and with the full range of choices (e.g., off-street parking, carport or garage) that are available for other residents.

**1109A.7 Location of accessible parking spaces.** The location of accessible parking spaces shall comply with the following:

1. Accessible parking spaces shall be located on the shortest possible accessible route to an accessible building, or covered multifamily dwelling unit entrance. All van accessible spaces may be grouped on one level of a multilevel parking facility.
2. When parking facilities are located adjacent to a building with multiple accessible entrances, accessible parking spaces shall be dispersed and located near the accessible building entrances.
3. When practical, the accessible route shall not cross lanes for vehicular traffic. When crossing vehicle traffic lanes is necessary, the accessible route shall be designated and marked as a crosswalk.
4. Parking facilities that do not serve a particular building shall have accessible parking spaces located on the shortest possible accessible route to an accessible pedestrian entrance of the parking facility.
5. Accessible parking spaces shall be located so that persons with disabilities are not compelled to wheel or walk behind parked cars other than their own.

**Exception:** When the enforcement agency determines that compliance with this section or providing equivalent facilitation would create an unreasonable hardship, parking spaces may be provided which would require a person with physical disabilities to wheel or walk behind other than accessible parking spaces.

**1109A.8 Design and construction.** Accessible parking required by this section shall be designed and constructed in accordance with Section 1109A.

**1109A.8.1 Vertical clearances.** All entrances, exits and vehicular passageways to and from required accessible parking spaces within parking facilities, shall have a minimum vertical clearance of 8 feet 2 inches (2489 mm) from the floor to the lowest projection of the ceiling. Reflective warning signs complying with Section 1143A for character height shall be installed at transitions from the 8 feet 2 inch ceiling to lower ceiling heights in vehicular passageways in the same parking level.

**1109A.8.2 Arrangement of parking spaces.** Parking spaces shall be arranged to comply with the following:

1. In each parking area, a bumper or curb shall be provided and located to prevent encroachment of cars over the required width of walkways.
2. Ramps, including curb ramps, shall not encroach into any accessible parking space or the adjacent loading and unloading access aisle.

**1109A.8.3 Slope of accessible parking spaces and access aisles.** Surface slopes of accessible parking spaces and access aisles shall be the minimum possible and shall not exceed  $\frac{1}{4}$  inch (6.35 mm) per foot (2.083-percent gradient) in any direction.

**1109A.8.4 Accessible parking space size.** Accessible parking spaces shall comply with Sections 1109A.8.5 and 1109A.8.6.

**1109A.8.5 Accessible single parking space.** Where accessible single spaces are provided, they shall be constructed in accordance with the following:

1. Single spaces shall be 14 feet (4267 mm) wide minimum, and shall provide a 9-foot (2743 mm) wide parking area and a 5-foot (1524 mm) wide loading and unloading access aisle. Access aisles shall be permitted to be located on either side of the vehicle, and shall extend the full required length of the parking spaces they serve.
2. When more than one space is provided, two 9-foot (2743 mm) wide parking spaces may be lined on each side of a 5-foot (1524 mm) wide loading and unloading access aisle.
3. The minimum length of each parking space shall be 18 feet (5486 mm).
4. The loading and unloading access aisle shall be marked by a border painted blue. Within the blue border, hatched lines a maximum of 36 inches (914 mm) on center shall be painted a color contrasting with the parking surface, preferably blue or white. The words "NO PARKING" shall be painted on the ground within each 5-foot (1524 mm) wide loading and unloading access aisle. This notice shall be painted in white letters no less than 12 inches (305 mm) high and located so that it is visible from the adjacent vehicular way.

**Note:** See Figures 11A-2A, 11A-2B and 11A-2C.

**1109A.8.6 Van accessible parking space.** One in every eight accessible spaces, but not less than one, shall be van

accessible and shall be constructed in accordance with the following:

1. Each van-accessible parking space shall be 17 feet (5181 mm) wide minimum, and shall provide either of the following:
  1. A 12-foot (3658 mm) wide minimum parking area and a 5-foot (1524 mm) wide minimum loading and unloading access aisle.
  2. A 9-foot (2743 mm) wide minimum parking area and an 8-foot (2438 mm) wide minimum loading and unloading access aisle.

Access aisles shall be located on the passenger side of the vehicle with the vehicle parked in the forward position, and shall extend the full required length of the parking spaces they serve.

2. The minimum length of each space shall be 18 feet (5486 mm).
3. Each space shall be designated "van accessible" as required by Section 1109A.8.8.
4. All van accessible spaces may be grouped on one level of a multilevel parking facility.
5. The loading and unloading access aisle shall be marked by a border painted blue. Within the blue border, hatched lines a maximum of 36 inches (914 mm) on center shall be painted a color contrasting with the parking surface, preferably blue or white. The words "NO PARKING" shall be painted on the ground within each loading and unloading access aisle. This notice shall be painted in white letters no less than 12 inches (305 mm) high and located so that it is visible from the adjacent vehicular way.

**Note:** See Figures 11A-2A, 11A-2B and 11A-2C.

**1109A.8.7 Adjacent parking.** Parking spaces adjacent to accessible parking spaces shall not be considered as loading and unloading access aisles.

**1109A.8.8 Identification.** Each accessible parking space shall be identified with signage and surface marking in accordance with Sections 1109A.8.8.1 and 1109A.8.8.2.

**1109A.8.8.1 Parking signage.** Each accessible parking space reserved for persons with disabilities shall be identified by a reflective sign consisting of the "International Symbol of Accessibility" complying with Section 1143A.8. The sign shall not be smaller than 70 square inches (4516 mm<sup>2</sup>) in area, and shall be posted 60 inches minimum above the finish floor or ground surface, measured to the bottom of the sign. Signs located on accessible routes shall be posted at a minimum height of 80 inches (2032 mm) above the finish floor or ground surface of the accessible route, measured to the bottom of the sign.

Signs identifying accessible parking spaces shall be visible from each parking space they serve, and shall be permanently posted immediately adjacent to the parking space or within the projected parking space width at the head end of the parking space. Signs may also be permanently posted on a wall at the interior end of the parking space.

*Van accessible spaces shall comply with Section 1109A.8.6 and shall have an additional sign or additional language stating "Van Accessible" below the symbol of accessibility.*

*An additional sign shall also be posted in a conspicuous place at each entrance to off-street parking facilities or immediately adjacent to and visible from each accessible stall or space. The sign shall not be less than 17 inches (432 mm) by 22 inches (559 mm) in size with lettering not less than 1 inch (25.4 mm) in height, and shall clearly and conspicuously state the following:*

*"Unauthorized vehicles parked in designated accessible spaces not displaying distinguishing placards or special license plates issued for persons with disabilities will be towed away at the owner's expense. Towed vehicles may be reclaimed at \_\_\_\_\_ or by telephoning\_\_\_\_\_."*

*Blank spaces are to be filled in with appropriate information as a permanent part of the sign.*

**1109A.8.8.2 Parking space marking.** In addition to the signage requirements, each accessible parking space shall have a surface identification complying with either of the following:

1. *The parking space shall be outlined or painted blue, and shall be marked with the "International Symbol of Accessibility" in white or a suitable contrasting color. The "International Symbol of Accessibility" shall be 36 inches (914 mm) wide by 36 inches (914 mm) high minimum, with the centerline 6 inches (152 mm) maximum from the centerline of the parking space, its sides parallel to the length of the parking space, and its lower side aligned with the end of the parking space.*
2. *The parking space shall be marked with the "International Symbol of Accessibility", in white on a blue background, 36 inches (914 mm) wide by 36 inches (914 mm) high minimum in size. The centerline of the "International Symbol of Accessibility" shall be 6 inches (152 mm) maximum from the centerline of the parking space, its sides shall be parallel to the length of the parking space, and its lower side shall be aligned with the end of the parking space length.*

**Note:** See Figures 11A-2A, 11A-2B and 11A-2C.

## SECTION 1110A EXTERIOR ACCESSIBLE ROUTES

**1110A.1 General.** When a building or portion of a building is required to be accessible or adaptable, an accessible route shall be provided to all portions of the building, accessible building entrances and between the building and the public way. The accessible route shall be the most practical direct route and to the maximum extent feasible, coincide with the route for the general public and building residents.

> *Exterior accessible routes shall be provided as follows:*

1. *At least one accessible route within the boundary of the site shall be provided from public transportation stops, accessible parking and accessible passenger loading*

*and unloading zones, and public streets or sidewalks to the accessible building entrance they serve. Where more than one route of travel is provided, all routes shall be accessible.*

2. *At least one accessible route shall connect accessible buildings, facilities, elements and spaces that are on the same site. Accessible routes shall be provided between accessible buildings and accessible site facilities when more than one building or facility is located on a site.*
3. *At least one accessible route shall connect accessible building or facility entrances with all accessible spaces, elements, and covered multifamily dwelling units.*
4. *An accessible route shall connect at least one accessible entrance of each covered multifamily dwelling unit with exterior spaces and facilities that serve the dwelling unit.*
5. *Where elevators are provided for vertical access, all elevators shall be accessible. See Section 1124A.*

**Note:** If the slope of the finished grade between covered multifamily dwellings and site arrival points, public use or common use facilities (including parking) exceeds 1 unit vertical in 12 units horizontal (8.33-percent slope), or where other physical barriers (natural or artificial) or legal restrictions, all of which are outside the control of the owner, prevent the installation of an accessible route, an acceptable alternative is to provide access by a vehicular route, provided:

1. *There is accessible parking on an accessible route for at least 2 percent of the covered multifamily dwelling units, and*
2. *Necessary site provisions such as parking spaces and curb ramps are provided at the public use or common use facility.*

**1110A.2 Signs.** At every primary public entrance and at every major junction where the accessible route diverges from the circulation path along or leading to an accessible route, entrance or facility, there shall be a sign displaying the "International Symbol of Accessibility." Signs shall indicate the direction to accessible building entrances and facilities and shall comply with the requirements found in Section 1143A.

**1110A.3 Floor and ground surfaces.** Floor and ground surfaces shall be stable, firm, and slip resistant. If carpet or carpet tile is used in a common-use area or public-use area on a ground or floor surface, it shall have firm backing or no backing. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile height shall be  $\frac{1}{2}$  inch (12.7 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with Section 1111A requirements for changes in level.

**1110A.3.1 Recessed doormats.** Recessed doormats shall be adequately anchored to prevent interference with wheelchair traffic.

**1110A.4 Exterior accessible routes over 200 feet.** Exterior accessible routes that exceed 200 feet (60 960 mm) in length shall comply with Section 1138A.1.2. (See Figure 11A-1L)

## SECTION 1111A CHANGES IN LEVEL ON ACCESSIBLE ROUTES

**1111A.1 Changes in level not exceeding  $\frac{1}{2}$  inch.** Abrupt changes in level along any accessible route shall not exceed  $\frac{1}{2}$  inch (12.7 mm). When changes in level do occur, they shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50-percent slope). Changes in level not exceeding  $\frac{1}{4}$  inch (6.35 mm) may be vertical.

**1111A.2 Changes greater than  $\frac{1}{2}$  inch.** Changes in level greater than  $\frac{1}{2}$  inch (12.7 mm) shall be made by means of a sloped surface not greater than 1 unit vertical in 20 units horizontal (5-percent slope), or a curb ramp, ramp, elevator or platform (wheelchair) lift. Stairs shall not be part of an accessible route. When stairs are located along or adjacent to an accessible route they shall comply with Section 1115A for exterior stairways.

## SECTION 1112A CURB RAMPS ON ACCESSIBLE ROUTES

**1112A.1 General.** Curb ramps within the boundary of the site shall be constructed at each corner of street intersections and where a pedestrian way crosses a curb. The preferred and recommended location for curb ramps is in the center of the crosswalk of each street corner. Where it is necessary to locate a curb ramp in the center of the curb return, the street surfaces shall be marked to identify pedestrian crosswalks, and the lower end of the curb ramp shall terminate within such crosswalk areas. Curb ramps do not require handrails.

**1112A.2 Obstructions.** Curb ramps shall be located or protected to prevent obstruction by parked cars. Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or the adjacent loading and unloading access aisle.

**1112A.3 Width of curb ramps.** Curb ramps shall be a minimum of 48 inches (1219 mm) in width.

**1112A.4 Diagonal curb ramps.** If diagonal (or corner-type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a 48-inch (1219 mm) minimum clear space as shown in Figures 11A-3A through 11A-3M. If diagonal curb ramps are provided at marked crossings, the 48-inch (1219 mm) clear space shall be within the markings (see Figures 11A-3A through 11A-3M). If diagonal curb ramps have flared sides, they shall also have at least a 24-inch-long (610 mm) segment of straight curb located on each side of the curb ramp and within the marked crossing. See Figures 11A-3A through 11A-3M.

**1112A.5 Slope of curb ramps.** The slope of curb ramps shall not exceed 1 unit vertical to 12 units horizontal (8.33-percent slope) and shall lie, generally, in a single sloped plane. Transitions from ramps to walks, gutters or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1 unit vertical to 20 units horizontal (5-percent slope) within 4 feet (1219 mm) of the top and bottom of the curb ramp.

If a curb ramp is located where pedestrians must walk across the ramp, then it shall have flared sides; the maximum slope of the flare shall be 1 unit vertical in 10 units horizontal (10-percent slope). Curb ramps with returned curbs may be

used where pedestrians would not normally walk across the ramp. See Figures 11A-3A through 11A-3M.

**1112A.6 Level landing.** A level landing 48 inches (1219 mm) deep shall be provided at the upper end of each curb ramp over its full width to permit safe egress from the ramp surface, or the slope of the fanned or flared sides of the curb ramp, shall not exceed 1 unit vertical to 12 units horizontal (8.33-percent slope).

**1112A.7 Finish.** The surface of each curb ramp and its flared sides shall be stable, firm and slip-resistant and shall be of contrasting finish from that of the adjacent sidewalk.

**1112A.8 Border.** All curb ramps shall have a grooved border 12 inches (305 mm) wide at the level surface of the sidewalk along the top and each side approximately  $\frac{3}{4}$  inch (19 mm) on center. All curb ramps constructed between the face of the curb and the street shall have a grooved border at the level surface of the sidewalk. See Figures 11A-3A through 11A-3K.

**1112A.9 Detectable warnings.** See Chapter 11B.

## SECTION 1113A WALKS AND SIDEWALKS ON ACCESSIBLE ROUTES

**1113A.1 Width and continuous surface.** Walks and sidewalks subject to this chapter shall have a continuous common surface, not interrupted by steps or by abrupt changes in level exceeding  $\frac{1}{2}$  inch (12.7 mm). (See Section 1111A.)

Walking surfaces shall be stable, firm, and slip resistant, and shall comply with Section 1110A.3.

**1113A.1.1 Width.** Walks and sidewalks shall be a minimum of 48 inches (1219 mm) in width, except that walks serving an individual dwelling unit in covered multifamily buildings may be reduced to 36 inches (914 mm) in clear width except at doors.

**1113A.1.2 Surface cross slopes.** Surface cross slopes shall not exceed 1 unit vertical in 48 units horizontal (2.083-percent slope).

**1113A.2 Walks with continuous gradients.** All walks on an accessible route with continuous gradients shall have level areas at least 60 inches (1524 mm) in length at intervals of at least every 400 feet (122 m).

**1113A.3 Five percent gradient.** When the slope in the direction of travel of any walk on an accessible route exceeds 1 unit vertical in 20 units horizontal (5-percent slope), it shall comply with the ramp provisions of Section 1114A.

**1113A.4 Level areas.** Walks on an accessible route shall be provided with a level area at each side of a door or gate. Level areas shall comply with the applicable requirements for maneuvering clearances in Section 1126A.3.

**1113A.5 Gratings.** Walks, sidewalks and pedestrian ways on an accessible route shall be free of gratings whenever possible. Gratings located in the surface of any of these areas, grid openings in gratings shall be limited to  $\frac{1}{2}$  inch (12.7 mm) in the direction of traffic. Elongated openings in gratings shall be placed so that the long dimension is perpendicular to the dominant direction of traffic.

### Exceptions:

- Where the enforcement agency determines that compliance with this section would create an unreason-

able hardship, an exception may be granted when equivalent facilitation is provided.

2. This section shall not apply in those conditions where, due to legal or physical constraints, all or portions of the site of the project will not allow compliance with these building standards or equivalent facilitation on all or portions of one site without creating an unreasonable hardship.

**1113A.6 Handrails.** Handrails provided along walking surfaces with running slopes not steeper than one unit vertical in 20 units horizontal (5-percent slope) shall comply with Section 1114A.6.

## SECTION 1114A EXTERIOR RAMPS AND LANDINGS ON ACCESSIBLE ROUTES

**1114A.1 Width.** The clear width of ramps shall be consistent with the requirements in Chapter 10 of this code, but in no case shall be less than 48 inches (1219 mm).

Handrails may project into the required clear width of the ramp at each side  $3\frac{1}{2}$  inches (89 mm) maximum at the handrail height. Curbs, wheel guides and/or appurtenances shall not project into the required clear width of ramps.

**Exception:** The clear width of ramps serving accessible entrances to covered multifamily dwellings with an occupant load of 10 or less may be 36 inches (914 mm) minimum between handrails.

**Note:** See Section 1114A.6.2.4 for handrail projections.

**1114A.2 Slope.** The maximum slope of ramps on an accessible route shall be no greater than 1 unit vertical in 12 units horizontal (8.33-percent slope). Transitions from ramps to walks, gutters or streets shall be flush and free of abrupt changes.

**Exception:** Ramps serving decks, patios or balconies as specified in Section 1132A.4.

**1114A.2.1 Cross slope.** The cross slope of ramp surfaces shall be no greater than 1 unit vertical in 48 units horizontal (2.083-percent slope).

**1114A.3 Outdoor ramps.** Outdoor ramps, ramp landings and their approaches shall be designed so that water will not accumulate on the walking surface.

**1114A.4 Landings.** Ramp landings shall be level and comply with this section.

**1114A.4.1 Location of landings.** Landings shall be provided at the top and bottom of each ramp. Intermediate landings shall be provided at intervals not exceeding 30 inches (762 mm) of vertical rise and at each change of direction. Landings are not considered in determining the maximum horizontal distance of each ramp.

**Note:** Examples of ramp dimensions are:

SLOPE (Grading %)	MAXIMUM RISE (Inches) ( $\times 25.4$ for mm)	MAXIMUM HORIZONTAL PROJECTION (Feet) ( $\times 304.8$ ) for mm)
1:12 (8.33%)	30	30
1:15 (6.67%)	30	37.5
1:16 (6.25%)	30	40
1:20 (5.00%)	30	50

**1114A.4.2 Size of top landings.** Top landings shall not be less than 60 inches (1524 mm) wide. Top landings shall have a minimum length of not less than 60 inches (1524 mm) in the direction of the ramp run. See Section 1126A.3 for maneuvering clearances at doors.

**1114A.4.3 Size of bottom and intermediate landings.** The minimum width of bottom and intermediate landings shall not be less than the width of the ramp.

Intermediate landings shall have a length in the direction of ramp run of not less than 60 inches (1524 mm). Bottom landings shall have a length in the direction of ramp run of not less than 72 inches (1829 mm).

**1114A.4.4 Encroachment of doors.** Doors in any position shall not reduce the minimum dimension of the landing to less than 42 inches (1067 mm) and shall not reduce the required width by more than 3 inches (76.2 mm) when fully open. (See Figure 11A-6D).

**1114A.4.5 Strike edge extension.** The width of the landing shall comply with Section 1126A.3 for strike edge extension and maneuvering clearance at doors.

Where doorways are located adjacent to a ramp landing, maneuvering clearance required by Section 1126A.3 shall be permitted to overlap the required landing area.

**1114A.4.6 Change of direction.** Intermediate landings at a change of direction shall be sized to provide 60 inches turning space complying with Section 1138A.1.3. Intermediate landings at a change of direction in excess of 30 degrees shall have a length in the direction of ramp run of not less than 72 inches (1829 mm). (See Figures 11A-6C and 11A-6D.)

**1114A.5 Ramp height.** Ramps more than 30 inches (762 mm) above the adjacent floor or ground and open on one or both sides shall be provided with guardrails as required by Section 1013. Guardrails shall be continuous from the top of the ramp to the bottom of the ramp.

### 1114A.6 Ramp handrails.

**1114A.6.1 Where required.** Handrails shall be provided at each side of ramps when the slope exceeds 1 unit vertical in 20 units horizontal (5-percent slope).

#### Exceptions:

1. Curb ramps.
2. Ramps that serve an individual dwelling unit may have one handrail, except that ramps open on one or both sides shall have handrails provided on the open side or sides.
3. Ramps at exterior door landings with less than 6 inches (152 mm) rise or less than 72 inches (1829 mm) in length.

### 1114A.6.2 Handrail configuration.

**1114A.6.2.1 Handrail heights.** The top of handrails shall be 34 to 38 inches (864 to 965 mm) above the ramp surface.

**1114A.6.2.2 Handrail continuity.** Handrails on all ramps shall be continuous within the full length of each ramp run. Inside handrails on switchback or dogleg ramps shall be continuous between ramp runs.

**1114A.6.2.3 Handrail extensions.** Handrails shall extend a minimum of 12 inches (305 mm) horizontally above landings, beyond the top and bottom of the ramp runs. Extensions shall return to a wall, guard, or the walking surface, or shall be continuous to the handrail of an adjacent ramp run. Handrail extensions shall be in the same direction as the ramp runs. (See Figure 11A-5A.)

**1114A.6.2.4 Handrail projections.** Handrails projecting from a wall shall have a space of  $1\frac{1}{2}$  inches (38.1 mm) minimum between the wall and the handrail.

Handrails may be located in a recess if the recess is a maximum of 3 inches (76.2 mm) deep and extends at least 18 inches (457 mm) above the top of the rail. Any wall or other surface adjacent to the handrail shall be free of sharp or abrasive elements. (See Figure 11A-6B.)

**1114A.6.2.5 Handrail gripping surfaces.** Handrail gripping surfaces shall be continuous along their length, and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. When provided, horizontal projections shall occur  $1\frac{1}{2}$  inches (38 mm) minimum below the bottom of the handrail gripping surface. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by  $\frac{1}{8}$  inch (3.2 mm) for each  $1\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension that exceeds 4 inches (102 mm).

Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements, and shall have rounded edges.

**Exception:** Where handrails are provided along walking surfaces with slopes not steeper than 1 unit vertical in 20 units horizontal, the bottoms of handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.

**1114A.6.2.6 Cross section.** Handrail gripping surfaces shall comply with this section, or the shape shall provide equivalent gripping surface.

**1. Circular cross section.** The handrail gripping surfaces with a circular cross section shall not be less than  $1\frac{1}{4}$  inches (31.75 mm) nor more than 2 inches (50.8 mm) in cross-sectional dimension.

**2. Noncircular cross section.** Handrail gripping surfaces with a noncircular cross section shall have a perimeter dimension of 4 inches (102 mm) minimum and  $6\frac{1}{4}$  inches (159 mm) maximum, and a cross-section dimension of  $2\frac{1}{4}$  inches (57 mm) maximum.

**1114A.6.2.7 Fittings.** Handrails shall not rotate within their fittings.

**1114A.7 Edge protection.** Ramps and ramp landings shall be provided with a continuous and uninterrupted barrier on each side along the entire length in compliance with Sections 1010.10 and 1010.10.1. (See Figure 11A-5A.)

**Note:** Extended floors or ground surfaces, as permitted in Section 1010.10.2, are not allowed for ramps and ramp landings part of an accessible route.

## SECTION 1115A EXTERIOR STAIRWAYS

**1115A.1 General.** Exterior stairways serving buildings on a site containing covered multifamily dwelling units shall comply with this section.

**1115A.2 Open risers.** Open risers are not permitted on exterior stairways.

### Exceptions:

1. An opening of not more than  $1\frac{1}{2}$  inch (12.7 mm) may be permitted between the base of the riser and the tread.
2. Risers constructed of grating containing openings of not more than  $1\frac{1}{2}$  inch (12.7 mm) may be permitted.

**1115A.3 Treads.** All tread surfaces shall be stable, firm and slip resistant, and shall comply with Section 1110A.3. Treads shall have smooth, rounded or chamfered exposed edges, and no abrupt edges at the nosing (lower front edge).

**1115A.4 Nosing.** Nosing shall not project more than  $1\frac{1}{4}$  inches (31.8 mm) past the face of the riser below. Risers shall be sloped or the underside of the nosing shall have an angle not more than 30 degrees (0.52 rad) from the vertical. (See Figure 11A-6A).

**1115A.5 Striping for the visually impaired.** Exterior stairs serving buildings on a site containing multifamily dwelling units shall have the upper approach and all treads marked by a stripe providing clear visual contrast.

The stripe shall be a minimum of 2 inches (50.8 mm) wide to a maximum of 4 inches (101.6 mm) wide placed parallel to, and not more than 1 inch (25.4 mm) from, the nose of the step or upper approach. The stripe shall extend the full width of the step or upper approach and shall be of material that is at least as slip resistant as the other treads of the stair. A painted stripe shall be acceptable. Grooves shall not be used to satisfy this requirement.

### 1115A.6 Exterior stairway handrails.

**1115A.6.1 Where required.** Stairways shall have handrails on each side. Intermediate handrails shall be located equidistant from the sides of the stairway and comply with Section 1012.9.

**Exception:** Stairways serving an individual dwelling unit may have one handrail, except that stairways open on one or both sides shall have handrails on the open side or sides.

### 1115A.6.2 Handrail configuration.

**1115A.6.2.1 Handrail heights.** The top of handrails shall be 34 to 38 inches (864 to 965 mm) above the nosing of the treads.

**1115A.6.2.2 Handrail continuity.** Handrails on all stairways shall be continuous within the full length of each stair flight. Inside handrails on switchback or dogleg stairs shall be continuous between stair flights.

**1115A.6.2.3 Handrail extensions.** At the top of stair flights, handrails shall extend a minimum of 12 inches (305 mm) horizontally above landings, beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the walking surface, or shall be continuous to the handrail of an adjacent stair flight.

*At the bottom of stair flights, handrails shall extend at the slope of the stair flight for a distance equal to one tread depth beyond the last riser nosing. Such extension shall continue with 12 inches (305 mm) minimum horizontal extension, shall be continuous to the handrail of an adjacent stair flight, or shall return to a wall, guard, or the walking surface. Handrail horizontal extensions shall be in the same direction as the stair flights. (See Figures 11A-6A and 11A-6E.)*

**1115A.6.2.4 Handrail projections.** Handrails projecting from a wall shall have a space of  $1\frac{1}{2}$  inches (38.1 mm) minimum between the wall and the handrail.

Handrails may be located in a recess if the recess is a maximum of 3 inches (76.2 mm) deep and extends at least 18 inches (457 mm) above the top of the rail. Any wall or other surface adjacent to the handrail shall be free of sharp or abrasive elements. (See Figure 11A-6B.)

**1115A.6.2.5 Handrail gripping surfaces.** Handrail gripping surfaces shall be continuous along their length, and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. When provided, horizontal projections shall occur  $1\frac{1}{2}$  inches (38.1 mm) minimum below the bottom of the handrail gripping surface. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by  $\frac{1}{8}$  inch (3.2 mm) for each  $\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension that exceeds 4 inches (102 mm).

Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements, and shall have rounded edges.

**1115A.6.2.6 Cross section.** Handrail gripping surfaces shall comply with this section, or the shape shall provide equivalent gripping surface.

- Circular cross section.** Handrail gripping surfaces with a circular cross section shall not be less than  $1\frac{1}{4}$  inches (31.75 mm) nor more than 2 inches (50.8 mm) in cross-sectional dimension.
- Noncircular cross section.** Handrail gripping surfaces with a noncircular cross section shall have a perimeter dimension of 4 inches (102 mm) minimum and  $6\frac{1}{4}$  inches (159 mm) maximum, and a cross-section dimension of  $2\frac{1}{4}$  inches (57 mm) maximum.

**1115A.6.2.7 Fittings.** Handrails shall not rotate within their fittings.

## SECTION 1116A HAZARDS ON ACCESSIBLE ROUTES

**1116A.1 Warning curbs.** Abrupt changes in level exceeding 4 inches (101.6 mm) in vertical dimension, such as changes

*in level at planters or fountains located in or adjacent to walks, sidewalks or other pedestrian ways shall be identified by curbs or other approved barriers projecting at least 6 inches (152.4 mm) in height above the walk or sidewalk surface to warn the blind of a potential drop-off.*

### Exceptions:

- Between a walk or sidewalk and an adjacent street or driveway.
- When a guardrail or handrail is provided with edge protection in accordance with Section 1010.10.1.

**1116A.2 Headroom clearance.** Walks, pedestrian ways, and other circulation spaces, which are part of the required egress system, shall have a minimum clear headroom as required in Section 1003.2. Other walks, pedestrian ways, and circulation spaces shall have a minimum clear headroom of 80 inches (2032 mm). If the vertical clearance of an area adjoining an accessible route is reduced to less than 80 inches (2032 mm), a guardrail or other barrier having its leading edge at or below 27 inches (686 mm) above the finished floor shall be provided.

**Exception:** Doorways and archways less than 24 inches (610 mm) in depth may have a minimum clear headroom of 80 inches (2032 mm). (See Section 1126A for door requirements.)

**1116A.3 Overhanging obstructions.** Any obstruction that overhangs a pedestrian way shall be a minimum of 80 inches (2032 mm) above the walking surface as measured from the bottom of the obstruction. (See Figure 11A-1B.) Where a guy support is used parallel to a path of travel, including, but not limited to, sidewalks, a guy brace, sidewalk guy or similar device shall be used to prevent an overhanging obstruction. (See Section 1116A.2 for required headroom clearance.)

**Exception:** Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the finish floor or ground.

**1116A.4 Free-standing signs.** Wherever signs mounted on posts or pylons protrude from the post or pylons and the bottom edge of the sign is less than 80 inches (2032 mm) above the finished floor or ground level, the edges of such signs shall be rounded or eased and the corners shall have a minimum radius of 0.125 inches (see Section 1116A.2 for required headroom clearance).

**1116A.5 Detectable warnings at vehicular areas.** When a walk crosses or adjoins a vehicular way, the walking surface shall be separated from the vehicular area by curbs, railings or other elements, or the boundary between the pedestrian areas and the vehicular areas shall be defined by a continuous detectable warning 36 inches (914 mm) wide minimum, complying with Chapter 11B, Section 11B-705.

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**SECTION 1117A  
GENERAL REQUIREMENTS FOR ACCESSIBLE  
ENTRANCES, EXITS, INTERIOR ROUTES OF  
TRAVEL AND FACILITY ACCESSIBILITY**

**Note:** In addition to provisions of this division, interior routes of travel that provide access to, or egress from, buildings for persons with disabilities shall also comply with Chapter 10.

**1117A.1 General.** When buildings are required to be accessible, building facilities shall be accessible as provided in this division. Where specific floors of a building are required to be accessible, the requirements of this division shall apply only to the facilities located on accessible floors.

**1117A.2 Primary entrances and exterior exit doors.** All primary entrances and exterior ground floor exit doors to buildings and facilities on accessible routes shall be accessible to persons with disabilities.

**1117A.3 Separate dwelling unit entrances.** When a ground-floor dwelling unit of a building has a separate entrance, each such ground-floor dwelling unit shall be served by an accessible route, except where the terrain or unusual characteristics of the site prohibit an accessible route (see Section 1150A for site impracticality tests).

**1117A.4 Multiple entrances.** Only one entrance to covered multifamily buildings is required to be accessible to any one ground floor of a building, except in cases where an individual dwelling unit has a separate exterior entrance. Where the building contains clusters of dwelling units with each cluster sharing a different exterior entrance, more than one entrance may be required to be accessible, as determined by analysis of the site. In every case, the accessible entrance shall be on an accessible route to the covered dwelling units it serves.

**1117A.5 Entrances from parking structures, tunnels or elevated walkways.** Where direct access for pedestrians is provided from a parking structure to a building or facility, each direct access to the building or facility entrance shall be accessible.

Where direct access for pedestrians is provided from a pedestrian tunnel or elevated walkway to a building or facility, all entrances to the building or facility from each tunnel or walkway shall be accessible.

**SECTION 1118A  
EGRESS AND AREAS OF REFUGE**

**1118A.1 General.** Including but not limited to the requirements contained in this chapter for accessible routes, signage and emergency warning systems in buildings or portions of buildings required to be accessible shall be provided with accessible means of egress as required by Chapter 10. (See Section 1007.)

**SECTION 1119A  
INTERIOR ACCESSIBLE ROUTES**

**1119A.1 General.** When a building or portion of a building is required to be accessible or adaptable, an accessible route shall be provided to all portions of the building, accessible building entrances and to covered multifamily dwelling units. The accessible route shall, to the maximum extent feasible, coincide with the route for the general public and other building residents. Accessible routes shall not pass through kitchens, storage rooms, restrooms, closets or other spaces used for similar purposes except within an individual dwelling unit.

Interior accessible routes shall be provided as follows:

1. Where more than one route of travel is provided, all routes shall be accessible.
2. At least one accessible route shall connect accessible building or facility entrances with all accessible spaces, elements and covered multifamily dwelling units.
3. An accessible route shall connect at least one accessible primary entrance of each covered multifamily dwelling unit with interior and exterior spaces and facilities that serve the unit.
4. Where elevators are provided for vertical access, all elevators shall be accessible.

**1119A.2 Floor and ground surfaces.** Floor and ground surfaces shall be stable, firm, and slip resistant. If carpet or carpet tile is used in a common use area or public use area on a ground or floor surface, it shall have firm backing or no backing. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile height shall be  $\frac{1}{2}$  inch (12.7 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with Section 1121A requirements for changes in level.

**1119A.2.1 Recessed doormats.** Recessed doormats shall be adequately anchored to prevent interference with wheelchair traffic.

**1119A.3 Widths.** Interior accessible routes serving an occupant load of 10 or more shall not be less than 44 inches (1118 mm) in width. Interior accessible routes serving an occupant load of less than 10 shall not be less than 36 inches (914 mm) in width.

If a person in a wheelchair must make a turn around a corner or an obstruction, the minimum clear width of the accessible route shall be as specified in Section 1138A.1.5.

**1119A.4 Interior accessible routes over 200 feet.** Interior accessible routes that exceed 200 feet (60 960 mm) in length shall comply with Section 1138A.1.2. (See Figure 11A-1L.)

**1119A.5 Changes in elevation.** Interior accessible routes which have changes in elevation shall be transitioned and comply with Sections 1121A or 1122A.

**Exception:** Doors and thresholds as provided in Section 1126A.

## SECTION 1120A RESERVED

### SECTION 1121A

#### CHANGES IN LEVEL ON ACCESSIBLE ROUTES

**1121A.1 Changes in level not exceeding  $\frac{1}{2}$  inch.** Abrupt changes in level along any accessible route shall not exceed  $\frac{1}{2}$  inch (12.7 mm). When changes in level do occur, they shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50-percent slope). Changes in level not exceeding  $\frac{1}{4}$  inch (6.35 mm) may be vertical.

**1121A.2 Changes greater than  $\frac{1}{2}$  inch.** Changes in level greater than  $\frac{1}{2}$  inch (12.7 mm) shall be made by means of a sloped surface not greater than 1 unit vertical in 20 units horizontal (5-percent slope), or a curb ramp, ramp, elevator or platform (wheelchair) lift. Stairs shall not be part of an accessible route. When stairs are located along or adjacent to an accessible route they shall comply with Section 1123A for interior stairways.

## SECTION 1122A INTERIOR RAMPS AND LANDINGS ON ACCESSIBLE ROUTES

**1122A.1 Width.** The clear width of ramps shall be consistent with the requirements in Chapter 10 of this code, but in no case shall be less than 48 inches (1219 mm).

Handrails may project into the required clear width of the ramp at each side  $3\frac{1}{2}$  inches (89 mm) maximum at the handrail height. Curbs, wheel guides and/or appurtenances shall not project into the required clear width of ramps.

**Exception:** The clear width of ramps serving accessible entrances to covered multifamily dwellings with an occupant load of 10 or less may be 36 inches (914 mm) minimum between handrails.

**Note:** See Section 1122A.5.2.4 for handrail projections.

**1122A.2 Slope.** The maximum slope of ramps on an accessible route shall be no greater than 1 unit vertical in 12 units horizontal (8.33-percent slope).

**1122A.2.1 Cross slope.** The cross slope of ramp surfaces shall be no greater than 1 unit vertical in 48 units horizontal (2.083-percent slope).

**1122A.3 Landings.** Ramp landings shall be level and comply with this section. (See Figure 11A-6C.)

**1122A.3.1 Location of landings.** Landings shall be provided at the top and bottom of each ramp. Intermediate landings shall be provided at intervals not exceeding 30 inches (762 mm) of vertical rise and at each change of direction. Landings are not considered in determining the maximum horizontal distance of each ramp.

**Note:** Examples of ramp dimensions are:

SLOPE (Grading %)	MAXIMUM RISE (Inches)		MAXIMUM HORIZONTAL PROJECTION (Feet)	
	(x 25.4 for mm)	(x 304.8 for mm)	(x 304.8 for mm)	(x 25.4 for mm)
1:12 (8.33%)	30		30	
1:15 (6.67%)	30		37.5	
1:16 (6.25%)	30		40	
1:20 (5.00%)	30		50	

**1122A.3.2 Size of top landings.** Top landings shall not be less than 60 inches (1524 mm) wide. Top landings shall

have a minimum length of not less than 60 inches (1524 mm) in the direction of the ramp run. See Section 1126A.3 for maneuvering clearances at doors. (See Figure 11A-6C.)

**1122A.3.3 Size of bottom and intermediate landings.** The minimum width of bottom and intermediate landings shall not be less than the width of the ramp.

Intermediate landings shall have a length in the direction of ramp run of not less than 60 inches (1524 mm).

Bottom landings shall have a length in the direction of ramp run of not less than 72 inches (1829 mm).

**1122A.3.4 Encroachment of doors.** Doors in any position shall not reduce the minimum dimension of the landing to less than 42 inches (1067 mm) and shall not reduce the required width by more than 3 inches (76.2 mm) when fully open. (See Figure 11A-6D.)

**1122A.3.5 Strike edge extension.** The width of the landing shall comply with Section 1126A.3 for maneuvering clearance at doors.

Where doorways are located adjacent to a ramp landing, maneuvering clearance required by Section 1126A.3 shall be permitted to overlap the required landing area.

**1122A.3.6 Change of direction.** Intermediate landings at a change of direction shall be sized to provide 60 inches turning space complying with Section 1138A.1.3. Intermediate landings at a change of direction in excess of 30 degrees shall have a length in the direction of ramp run of not less than 72 inches (1829 mm). (See Figures 11A-6C and 11A-6D.)

**1122A.4 Ramp height.** Ramps more than 30 inches (762 mm) above the adjacent floor or ground and open on one or both sides shall be provided with a guard as required by Section 1013. Guardrails shall be continuous from the top of the ramp to the bottom of the ramp.

#### 1122A.5 Ramp handrails.

**1122A.5.1 Where required.** Handrails shall be provided at each side of ramps when the slope exceeds 1 unit vertical in 20 units horizontal (5-percent slope).

##### Exceptions:

1. Curb ramps.
2. Ramps that serve an individual dwelling unit may have one handrail, except that ramps open on one or both sides shall have handrails provided on the open side or sides.

#### 1122A.5.2 Handrail configuration.

**1122A.5.2.1 Handrail heights.** The top of handrails shall be 34 to 38 inches (864 to 965 mm) above the ramp surface.

**1122A.5.2.2 Handrail continuity.** Handrails on all ramps shall be continuous within the full length of each ramp run. Inside handrails on switchback or dogleg ramps shall be continuous between ramp runs.

**1122A.5.2.3 Handrail extensions.** Handrails shall extend a minimum of 12 inches (305 mm) horizontally above landings, beyond the top and bottom of the ramp runs. Extensions shall return to a wall, guard, or the walking surface, or shall be continuous to the handrail of an adja-

cent ramp run. Handrail extensions shall be in the same direction as the ramp runs. (See Figure 11A-5A.)

**1122A.5.2.4 Handrail projections.** Handrails projecting from a wall shall have a space of  $1\frac{1}{2}$  inches (38.1 mm) minimum between the wall and the handrail.

Handrails may be located in a recess if the recess is a maximum of 3 inches (76.2 mm) deep and extends at least 18 inches (457 mm) above the top of the rail. Any wall or other surface adjacent to the handrail shall be free of sharp or abrasive elements. (See Figure 11A-6B.)

**1122A.5.2.5 Handrail gripping surfaces.** Handrail gripping surfaces shall be continuous along their length, and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. When provided, horizontal projections shall occur  $1\frac{1}{2}$  inches (38 mm) minimum below the bottom of the handrail gripping surface. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by  $\frac{1}{8}$  inch (3.2 mm) for each  $\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension that exceeds 4 inches (102 mm).

Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements, and shall have rounded edges.

**Exception:** Where handrails are provided along walking surfaces with slopes not steeper than 1 unit vertical in 20 units horizontal, the bottoms of handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.

**1122A.5.2.6 Cross section.** Handrail gripping surfaces shall comply with this section, or the shape shall provide equivalent gripping surface.

**1. Circular cross section.** The handrail gripping surfaces with a circular cross section shall not be less than  $1\frac{1}{4}$  inches (31.75 mm) nor more than 2 inches (50.8 mm) in cross-sectional dimension.

**2. Noncircular cross section.** Handrail gripping surfaces with a noncircular cross section shall have a perimeter dimension of 4 inches (102 mm) minimum and  $6\frac{1}{4}$  inches (159 mm) maximum, and a cross-section dimension of  $2\frac{1}{4}$  inches (57 mm) maximum.

**1122A.5.2.7 Fittings.** Handrails shall not rotate within their fittings.

**1122A.6 Edge protection.** Ramps and ramp landings shall be provided with a continuous and uninterrupted barrier on each side along the entire length in compliance with Sections 1010.10 and 1010.10.1. (See Figure 11A-5A.)

**Note:** Extended floors or ground surfaces, as permitted in Section 1010.10.2, are not allowed for ramps and ramp landings providing access to, or egress from, buildings or facilities where accessibility is required.

## SECTION 1123A INTERIOR STAIRWAYS

**1123A.1 General.** Interior stairways serving buildings containing covered multifamily dwelling units shall comply with this section.

**1123A.2 Open risers.** Open risers shall not be permitted on interior stairways.

**Exception:** Stairways within an individual dwelling unit.

**1123A.3 Treads.** All tread surfaces shall be stable, firm and slip resistant, and shall comply with Section 1119A.2. Treads shall have smooth, rounded or chamfered exposed edges and no abrupt edges at the nosing (lower front edge).

**1123A.4 Nosing.** Nosing shall not project more than  $1\frac{1}{4}$  inches (31.8 mm) past the face of the riser below. Risers shall be sloped or the underside of the nosing shall have an angle not more than 30 degrees (0.52 rad) from the vertical. (See Figure 11A-6A.)

**1123A.5 Striping for the visually impaired.** Interior stairs shall have the upper approach and lower tread marked by a stripe providing clear visual contrast.

The stripe shall be a minimum of 2 inches (50.8 mm) wide to a maximum of 4 inches (101.6 mm) wide placed parallel to, and not more than 1 inch (25.4 mm) from, the nose of the step or upper approach. The stripe shall extend the full width of the step or upper approach and shall be of material that is at least as slip resistant as the other treads of the stair. A painted stripe shall be acceptable. Grooves shall not be used to satisfy this requirement.

**Exception:** Striping is not required for stairways within individual dwelling units.

### 1123A.6 Interior stairway handrails.

**1123A.6.1 Where required.** Stairways shall have handrails on each side. Intermediate handrails shall be located equidistant from the sides of the stairway and comply with Section 1012.9.

**Exception:** Stairways serving an individual dwelling unit may have one handrail, except that stairways open on one or both sides shall have handrails on the open side or sides.

#### 1123A.6.2 Handrail configuration.

**1123A.6.2.1 Handrail heights.** The top of handrails shall be 34 to 38 inches (864 to 965 mm) above the nosing of the treads.

**1123A.6.2.2 Handrail continuity.** Handrails on all stairways shall be continuous within the full length of each stair flight. Inside handrails on switchback or dogleg stairs shall be continuous between stair flights.

**1123A.6.2.3 Handrail extensions.** At the top of stair flights, handrails shall extend a minimum of 12 inches (305 mm) horizontally above landings, beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the walking surface, or shall be continuous to the handrail of an adjacent stair flight.

At the bottom of stair flights, handrails shall extend at the slope of the stair flight for a distance equal to one tread depth beyond the last riser nosing. Such extension shall continue with 12 inches (305 mm) minimum horizontal extension, shall be continuous to the handrail of an adjacent stair flight, or shall return to a wall, guard, or the walking surface. Handrail horizontal extensions shall be in the same direction as the stair flights. (See Figures 11A-6A and 11A-6E.)

**Exception:** Stairways within an individual dwelling unit.

**1123A.6.2.4 Handrail projections.** Handrails projecting from a wall shall have a space of  $1\frac{1}{2}$  inches (38.1 mm) minimum between the wall and the handrail.

Handrails may be located in a recess if the recess is a maximum of 3 inches (76.2 mm) deep and extends at least 18 inches (457 mm) above the top of the rail. Any wall or other surface adjacent to the handrail shall be free of sharp or abrasive elements. (See Figure 11A-6B.)

**1123A.6.2.5 Handrail gripping surfaces.** Handrail gripping surfaces shall be continuous along their length, and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. When provided, horizontal projections shall occur  $1\frac{1}{2}$  inches (38 mm) minimum below the bottom of the handrail gripping surface. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by  $\frac{1}{8}$  inch (3.2 mm) for each  $\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension that exceeds 4 inches (102 mm).

Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements, and shall have rounded edges.

**1122A.6.2.6 Cross section.** Handrail gripping surfaces shall comply with this section, or the shape shall provide equivalent gripping surface.

1. **Circular cross section.** The handrail gripping surfaces with a circular cross section shall not be less than  $1\frac{1}{4}$  inches (31.75 mm) nor more than 2 inches (50.8 mm) in cross-sectional dimension.

2. **Noncircular cross section.** Handrail gripping surfaces with a noncircular cross section shall have a perimeter dimension of 4 inches (102 mm) minimum and  $6\frac{1}{4}$  inches (159 mm) maximum, and a cross-section dimension of  $2\frac{1}{4}$  inches (57 mm) maximum.

**1122A.6.2.7 Fittings.** Handrails shall not rotate within their fittings.

## SECTION 1124A ELEVATORS AND PLATFORM (WHEELCHAIR) LIFTS

**1124A.1 General.** Elevators provided in covered multifamily buildings shall be accessible. Elevators required to be accessible shall comply with this chapter, ASME A17.1 (Safety Code for Elevators and Escalators), Title 8 of the California Code of Regulations, under "Elevator Safety Orders," and any other applicable safety regulations of other administrative authorities having jurisdiction.

**Exception:** Private elevators serving only one dwelling unit.

**1124A.2 Location.** Passenger elevators shall be located on a major accessible route and provisions shall be made to ensure that they remain accessible and usable at all times that the building is occupied.

**1124A.3 Size of cab and control locations.**

**1124A.3.1 General.** Elevators serving covered multifamily buildings shall be sized to accommodate a wheelchair in accordance with this section.

**Exception:** When the enforcing agency determines that compliance with any requirement of this section would create an unreasonable hardship, an exception to the requirement shall be granted when equivalent facilitation is provided, and where it can be demonstrated that a person using a wheelchair can enter and operate the elevator.

**1124A.3.2 Car inside.** The elevator car shall be designed to comply with one of the following:

1. **Door centered on the wall.** When the door is centered on the car wall, it shall provide a clear width of 42 inches (1067 mm) minimum, and the clear distance between car side walls shall be 80 inches (2032 mm) minimum. The clear distance between the back wall and the return panel shall be 51 inches (1295 mm) minimum. The clear distance between the back wall and the inside face of the door shall be 54 inches (1372 mm) minimum.

2. **Door not centered on the wall.** When the door is not centered on the car wall, it shall provide a clear width of 36 inches (914 mm) minimum, and the clear distance between car side walls shall be 68 inches (1727 mm) minimum. The clear distance between the back wall and the return panel shall be 51 inches (1295 mm) minimum. The clear distance between the back wall and the inside face of the door shall be 54 inches (1372 mm) minimum.

3. **Door at any location.** An elevator door with 36 inches (914 mm) minimum clear width may be installed at any location if one of the following is met:

3.1. The car inside, with the door closed, shall provide a turning clear space at least 60 inches (1524 mm) in diameter to allow for the turning of a wheelchair.

3.2. The clear distance between car side walls shall be 54 inches (1372 mm) minimum. The clear distance between the back wall and the return panel shall be 80 inches (2032 mm) minimum. The clear distance between the back wall and the inside face of the door shall be 80 inches (2032 mm) minimum.

**Note:** See Table 1124A.3.2 and Figure 11A-7A.

**1124A.3.3 Car controls.**

**1124A.3.3.1 Car control location.** Elevator floor buttons shall be located within one of the reach ranges specified in Section 1138A.3. Except for photoelectric tube bypass switches, emergency controls, including the emergency stop and alarm, shall be grouped in or adjacent to the bottom of the panel and shall be no lower than 35 inches (889 mm) from the floor. For multiple controls, only one set must comply with these height requirements. Floor buttons shall be provided with visual indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

**1124A.3.3.2 Car control buttons.** Passenger elevator car controls shall have a minimum dimension of  $\frac{3}{4}$  inch

(19.1 mm) and shall be raised  $\frac{1}{8}$  inch (3.2 mm) plus or minus  $\frac{1}{32}$  inch (0.8 mm) above the surrounding surface.

Control buttons shall be illuminated, shall have square shoulders and shall be activated by a mechanical motion that is detectable.

All control buttons shall be designated by a  $\frac{5}{8}$ -inch-minimum (15.9 mm) raised characters and standard raised symbols that comply with Sections 1143A.6 and 1143A.7 immediately to the left of the control button. Contracted Grade 2 Braille that conforms to Section 1143A.7 shall be located immediately below the numeral, character or symbol. A minimum clear space of  $\frac{3}{8}$  inch (9.5 mm) or other suitable means of separation shall be provided between rows of control buttons. (See Figure 11A-7B.)

The raised characters and symbols shall be white on a black background. Controls and emergency equipment identified by raised symbols shall include, but not be limited to, "door open," "door close," "alarm bell," "emergency stop" and "telephone." The call button for the main entry floor shall be designated by a raised star at the left of the floor designation.

**1124A.3.4 Emergency telephone.** When an emergency telephone system is installed, the emergency telephone handset shall be positioned no higher than 48 inches (1219 mm) above the floor, and the handset cord shall be a minimum of 29 inches (737 mm) in length. If the telephone system is located in a closed compartment, the compartment door hardware shall conform to the provisions of Section 1138A.4.4. Emergency intercommunication shall not require voice communication.

**1124A.4 Hall call buttons.** Call operation buttons and keypads shall be located within one of the reach ranges specified in Section 1138A.3, measured to the centerline of the highest operable part. Buttons shall have square shoulders, shall be a minimum of  $\frac{3}{4}$  inch (19.1 mm) in size, and shall be raised  $\frac{1}{8}$  inch (3.2 mm) plus or minus  $\frac{1}{32}$  inch (0.8 mm) above the surrounding surface. The button designating the "Up" direction shall be on top. A clear floor or ground space complying with Section 1138A.1.4 shall be provided at call controls.

Visual indication shall be provided to show each call registered and extinguished when answered. Objects adjacent to, and below, hall call buttons shall not project more than 4 inches (101.6 mm) from the wall. Hall call buttons shall be

internally illuminated with a white light over the entire surface of the button.

**1124A.5 Minimum illumination.** The minimum illumination at the car controls threshold and the landing when the car and landing doors are open shall not be less than 5 foot-candles (54 lx).

**1124A.6 Hall lantern.** A visual and audible signal shall be provided at each hoistway entrance indicating to the prospective passenger the car answering the call and its direction of travel as follows:

1. The visual signal for each direction shall be a minimum of  $2\frac{1}{2}$  inches (63.5 mm) high by  $2\frac{1}{2}$  inches (63.5 mm) wide, and visible from the proximity of the hall call button.
2. The audible signal shall sound once for the "up" direction and twice for the "down" direction or of a configuration which distinguishes between up and down elevator travel. Audible signals shall have a frequency of 1500 Hz maximum. Verbal annunciators shall have a frequency of 300 Hz minimum and 3000 Hz maximum. The audible signal and verbal annihilator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the hall call button.
3. The center line of the fixture shall be located a minimum of 6 feet (1829 mm) in height above the finish floor.
4. The use of in-car lanterns, located in or on the car doorjambs, visible from the proximity of the hall call buttons and conforming to the above requirements of this section, shall be acceptable.

**Note:** The use of arrow shapes are preferred for visible signals.

#### 1124A.7 Door delay.

**1124A.7.1 Hall call.** The minimum acceptable time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close shall be calculated by the following equations, but shall be no less than 5 seconds:

$$T = D / (1.5 \text{ ft/s}) \text{ or } T = D / (445 \text{ mm/s})$$

Where  $T$  is the total time in seconds and  $D$  is the distance from a point in the lobby or landing area 60 inches (1524 mm) directly in front of the farthest call button controlling that car to the centerline of its hoistway door (see Figure 11A-7D). For cars with in-car lanterns,  $T$  begins

TABLE 1124A.3.2  
ELEVATOR CAR DIMENSIONS

DOOR LOCATION	DOOR CLEAR WIDTH	INSIDE CAR, SIDE TO SIDE	MINIMUM DIMENSIONS	
			INSIDE CAR, BACK WALL TO FRONT RETURN	INSIDE CAR, BACK WALL TO INSIDE FACE OF DOOR
Centered	42 inches (1067 mm)	80 inches (2032 mm)	51 inches (1295 mm)	54 inches (1372 mm)
Side (off-centered)	36 inches (914 mm) <sup>1</sup>	68 inches (1727 mm)	51 inches (1295 mm)	54 inches (1372 mm)
Any	36 inches (914 mm) <sup>1</sup>	54 inches (1372 mm)	80 inches (2032 mm)	80 inches (2032 mm)
Any	36 inches (914 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>

1. A tolerance of minus  $\frac{5}{8}$  inch (15.9 mm) is permitted.

2. Other car configurations that provide a turning space complying with Section 1138A.1.3 with the door closed shall be permitted.

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when the lantern is visible from the vicinity of hall call buttons and an audible signal is sounded.

**1124A.7.2 Door delay for car calls.** The minimum acceptable time for the door to remain fully open after receiving a call shall not be less than 5 seconds.

**1124A.8 Doorjamb marking.** The floor level at all elevator hoistway entrances shall be designated by raised characters provided on both jambs. Characters shall be 2 inches (50.8 mm) in height located 48 inches (1219 mm) minimum above the finish floor, measured from the baseline of the lowest Braille cells, and 60 inches (1524 mm) maximum above the finish floor, measured from the baseline of the highest line of raised characters.

On the main entry level, a raised five-pointed star shall be placed to the left of the raised character. The outside diameter of the star shall be 2 inches (50.8 mm) and all points shall be of equal length. The raised characters and the star shall be white on a black background. Contracted Grade 2 Braille, conforming to Section 1143A.7, shall be placed below the corresponding raised characters and the star. The Braille translation for the star shall state "MAIN". The raised characters shall comply with Section 1143A.6. (See Figure 11A-7C.)

**1124A.9 Door protective and reopening devices.** Doors closed by automatic means shall be provided with a door-reopening device that will function to stop and reopen a car door and adjacent hoistway door in case the car door is obstructed while closing.

This reopening device shall also be capable of sensing an object or person in the path of a closing door without requiring contact for activation at a nominal 5 inches and 29 inches (127 mm and 737 mm) above the floor.

Door-reopening devices shall remain effective for a period of not less than 20 seconds. After such an interval, the doors may close in accordance with the requirements of ASME A17.1.

**1124A.10 Operation and leveling.** The elevator shall be automatic and be provided with a self-leveling feature that will automatically bring the car to the floor landings within a tolerance of plus or minus  $\frac{1}{2}$  inch (12.7 mm) under rated loading to zero loading conditions. This self-leveling shall, within its zone, be entirely automatic and independent of the operating device and shall correct the overtravel or underravel. The car shall also be maintained approximately level with the landing, irrespective of load.

The clearance between the car platform sill and the edge of the hoistway landing shall be no greater than  $1\frac{1}{4}$  inches (31.75 mm).

**1124A.11 Platform (wheelchair) lifts.**

**1124A.11.1 General.** Platform (wheelchair) lifts may be provided between levels, in lieu of passenger elevators, when the vertical distance between landings, as well as the structural design and safeguards are as allowed by ASME A18.1 (Safety Standard for Platform Lifts and Stairway Chair Lifts), California Code of Regulations, Title 8 (Elevator Safety Orders), and any applicable safety regulations of other administrative authorities having jurisdiction.

If lifts are provided, they shall be designed and constructed to facilitate unassisted entry, operation and exit from the lift, and shall comply with restrictions and enhancements of this section in conjunction with Title 8 of the California Code of Regulations.

**1124A.11.2 Size and clear floor space.** Platform (wheelchair) lifts shall be of sufficient size to accommodate a wheelchair in accordance with Section 1138A.1.4.

**1124A.11.3 Lift access.** There shall be a level and clear floor area or landing at each floor or level served by platform (wheelchair) lifts. Clear floor areas or landings shall meet the applicable "accessible route" requirements.

**1124A.11.4 Standby power.** To ensure continued operation in case of primary power loss, platform (wheelchair) lifts shall be provided with standby power or with self-rechargeable battery power that provides sufficient power to operate all platform lift functions for a minimum of five upward and downward trips.

**1124A.11.5 Openness.** Platform (wheelchair) lifts on an accessible means of egress shall not be installed in a fully enclosed hoistway.

**1124A.11.6 Doors and gates.** Lifts shall have low energy power-operated doors or gates, which shall remain open for 20 seconds minimum. End doors shall have 32 inches (813 mm) minimum clear opening width. Side doors clear opening width shall be 42 inches (1067 mm) minimum.

**Exception:** Lifts having doors or gates on opposite sides shall be permitted to have self-closing manual doors or gates.

**1124A.11.7 Restriction sign.** A sign complying with Section 1143A shall be securely fastened in a conspicuous place at each landing and on the platform. The sign shall state "No Freight" in letters not less than 5/8 inch (16 mm) high and include the "International Symbol of Accessibility."

## SECTION 1125A HAZARDS ON ACCESSIBLE ROUTES

**1125A.1 Warning curbs.** Abrupt changes in level exceeding 4 inches (101.6 mm) in vertical dimension, such as changes in level at planters or fountains located in or adjacent to walks, halls, corridors, passageways, aisles, pedestrian ways and other circulation spaces shall be identified by curbs projecting at least 6 inches (152.4 mm) in height above the walk or sidewalk surface to warn the blind of a potential drop-off.

**Exception:** When a guardrail or handrail is provided with edge protection in accordance with Section 1010.10.1.

**1125A.2 Headroom clearance.** Walks, halls, corridors, passageways, aisles, pedestrian ways and other circulation spaces which are part of the required egress system shall have a minimum clear headroom as required in Section 1003.2. Other walks, pedestrian ways and circulation spaces shall have a minimum clear headroom of 80 inches (2032 mm). If the vertical clearance of an area adjoining an accessible route is reduced to less than 80 inches (2032 mm), a guardrail or other barrier having its leading edge at or below 27 inches (686 mm) above the finished floor shall be provided.

**Exception:** Doorways and archways less than 24 inches (610 mm) in depth may have a minimum clear headroom of 80 inches (2032 mm). (See Section 1126A for door requirements.)

**1125A.3 Overhanging obstructions.** Any obstruction that overhangs a pedestrian way shall be a minimum of 80 inches (2032 mm) above the walking surface as measured from the bottom of the obstruction. (See Figure 11A-1B.) Where a guy

support is used parallel to a path of travel, including, but not limited to, sidewalks, a guy brace, sidewalk guy or similar device shall be used to prevent an overhanging obstruction (see Section 1125A.2 for required headroom clearance).

**Exception:** Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the finish floor or ground.

**1125A.4 Free-standing signs.** Wherever signs mounted on posts or pylons protrude from the posts or pylons and the bottom edge of the sign is less than 80 inches (2032 mm) above the finished floor or ground level, the edges of such signs shall be rounded or eased and the corners shall have a minimum radius of 0.125 inches. (See Section 1125A.2 for required headroom clearance).

## SECTION 1126A DOORS, GATES AND WINDOWS

**1126A.1 Width and height of doors and gates.** Doorways which provide access to common use areas or covered multifamily dwellings shall comply with the following:

1. Permit the installation of a door or gate not less than 36 inches (914 mm) in width, not less than 80 inches (2032 mm) in height, and provide a clear opening of not less than 32 inches (813 mm), measured with the door positioned at an angle of 90 degrees from its closed position.
2. Doors or gates shall be capable of opening at least 90 degrees.
3. A pair of doors or gates, manual or automatic, shall have at least one leaf which provides a clear width of not less than 32 inches (813 mm), measured with the door or gate positioned at an angle of 90 degrees from its closed position.
4. The width of any component in the egress system shall not be less than the minimum width required by Section 1005.
5. Revolving doors or gates shall not be used as required entrances for persons with disabilities, and shall not be part of an accessible route.

**1126A.2 Level floor or landing.** The floor or landing on each side of an exit door or gate shall be level. (See Chapter 10.)

> **1126A.2.1 Thresholds and changes in elevation.** The floor or landing shall not be more than  $\frac{1}{2}$  inch (12.7 mm) lower than the top of the threshold of the doorway. (See Figure 11A-8I.)

Changes in level between  $\frac{1}{4}$  inch (6.35 mm) and  $\frac{1}{2}$  inch (12.7 mm) shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50-percent slope). Changes in level greater than  $\frac{1}{2}$  inch (12.7 mm) shall be accomplished by means of a ramp. (See Section 1122A.)

> **1126A.3 Maneuvering clearances.**

**1126A.3.1 General.** The minimum maneuvering clearance at doors or gates shall comply with Sections 1126A.3.2, 1126A.3.3, and 1126A.3.4. The floor or landing area within the required maneuvering clearance shall be level and clear. The required length shall be measured at right angles to the plane of the door or gate in its closed position. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearances (strike edge maneuvering clearances).

**1126A.3.2 Swinging doors and gates.**

**1126A.3.2.1 Front approach.** The following provisions shall apply to swinging doors or gates with front approach:

1. **Pull side approach.** The level floor or landing shall extend in the direction of the door or gate swing at least 60 inches (1524 mm). (See Figure 11A-8A(a).)
2. **Push side approach.** The level floor or landing shall extend in the direction of the door or gate swing at least 48 inches (1219 mm). (See Figure 11A-8A(a).)
3. **Doors and gates with push side approach having both a closer and a latch.** Doors or gates with push side approach having both a closer and a latch shall be provided with a clear and level area extending a minimum of 12 inches (305 mm) past the strike edge on the approach side of the door or gate. (See Figure 11A-8A(a).)
4. **Strike edge maneuvering space.** The width of the level area on the side to which the door or gate swings shall extend at least 24 inches (610 mm) past the strike edge for exterior doors or gates and at least 18 inches (457 mm) past the strike edge for interior doors or gates. (See Figure 11A-8A(a).)

**Note:** See Section 1132A.5 for maneuvering clearances at primary entry doors and all required exit doors to covered multifamily dwellings.

**1126A.3.2.2 Hinge side approach.** The following provisions shall apply to swinging doors or gates with hinge side approach:

1. **Pull side approach.** Doors or gates with pull side approach shall be provided with a level floor or landing not less than 60 inches (1524 mm) in depth. A clear and level area shall extend a minimum of 36 inches (914 mm) past the strike edge on the approach side of the door or gate. (See Figure 11A-8A(b).)
2. **Push side approach.** Doors or gates with push side approach shall have a level floor or landing not less than 44 inches (1118 mm) in depth, and shall be provided with a clear and level area extending a minimum of 54 inches (1372 mm) from the strike edge of the door or gate jamb past the hinge side of the door or gate. Doors or gates with a latch and closer shall have a level floor or landing not less than 48 inches (1219 mm) depth at the push side of the door or gate. (See Figure 11A-8A(b).)

**1126A.3.2.3 Latch side approach.** The following provisions shall apply to swinging doors or gates with latch side approach:

1. **Pull side approach.** Doors or gates with pull side approach shall have a level floor or landing not less than 60 inches (1524 mm) in depth, and shall be provided with a clear and level area extending a minimum of 24 inches (610 mm) past the strike edge on the approach side of the door or gate. (See Figure 11A-8A(c).)
2. **Push side approach.** Doors or gates with push side approach shall have a level floor or landing not less than 44 inches (1118 mm) in depth, and shall be provided with a clear and level area

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extending a minimum of 24 inches (610 mm) past the strike edge on the approach side of the door or gate. Doors or gates with a closer shall have a level floor or landing not less than 48 inches (1219 mm) depth at the push side of the door or gate. (See Figure 11A-8A(c).)

**1126A.3.3 Space between consecutive doors or gates.** The minimum space between two hinged or pivoted doors or gates in series, serving other than a required exit stairway, shall provide a minimum of 48 inches (1219 mm) plus the width of the door or gate swinging into the space. Doors or gates in a series shall swing either in the same direction or away from the space between the doors or gates. (See Figures 11A-8G and 11A-8H.)

Where the door or gate opens into a stair or smokeproof enclosure, the landing need not have a minimum length of 60 inches (1524 mm). (See Figure 11A-8H.)

**1126A.3.4 Doorways without doors or gates, sliding doors, and folding doors.** Doorways less than 36 inches (914 mm) wide without doors or gates, sliding doors, or folding doors shall have maneuvering clearances complying with this section.

**1126A.3.4.1 Front approach.** The level floor or landing shall extend at least 48 inches (1219 mm) on each side, perpendicular to the doorway. Strike edge maneuvering clearance for front approach is not required. (See Figure 11A-8B(a).)

**1126A.3.4.2 Side approach.** Doorways without doors or gates, and side approach, shall be provided with level floor or landing extending 42 inches (1067 mm) minimum on each side, perpendicular to the doorway. Strike edge maneuvering clearance is not required. (See Figure 11A-8B(d).)

**1126A.3.4.3 Pocket/ hinge side approach.** Doors with pocket or hinge approach shall be provided with a level floor or landing not less than 42 inches (1067 mm) in depth. The level floor or landing shall extend a minimum of 22 inches (559 mm) beyond the pocket/hinge side. (See Figure 11A-8B(b).)

**1126A.3.4.4 Stop/latch side approach.** Doors with stop or latch approach shall have a level floor or landing not less than 42 inches (1067 mm) in depth. The level floor or landing shall extend a minimum of 24 inches (610 mm) beyond the stop/latch side. (See Figure 11A-8B(c).)

**1126A.3.4.5 Recessed doors or gates.** Maneuvering clearances for forward approach shall be provided when any obstruction within 18 inches (457 mm) of the latch side of an interior doorway, or within 24 inches (610 mm) of the latch side of an exterior doorway, projects more than 8 inches (203 mm) beyond the face of the door or gate, measured perpendicular to the face of the door or gate. (See Figure 11A-8C.)

**1126A.4 Closer-effort to operate doors or gates.** Maximum effort to operate doors or gates shall not exceed  $8\frac{1}{2}$  pounds (38 N) for exterior doors or gates and 5 pounds (22 N) for interior doors or gates, such pull or push effort being applied at right angles to hinged doors or gates and at the center plane of sliding or folding doors. Compensating devices or automatic door or gate operators may be utilized to meet these standards. When fire doors are required, the maximum effort to operate the door may be increased to the minimum

allowable by the appropriate enforcement agency, not to exceed 15 pounds (66.7 N).

**1126A.4.1 Door or gate closer.** If a door or gate has a closer, the sweep period of the closer shall be adjusted so that from an open position of 90 degrees, the door or gate will take 5 seconds minimum to move to a position of 12 degrees from the latch.

**1126A.4.2 Spring hinges.** Spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

**1126A.5 Type of latch and lock.** The type of latch and lock required for all doors or gates shall be in accordance with Section 1126A.6 and Chapter 10, Section 1008.

**1126A.6 Hand-activated door or gate hardware.** Hand-activated door or gate latching, locking and opening hardware shall be centered between 30 inches (762 mm) and 44 inches (1118 mm) above the floor. Latching and locking doors or gates that are hand-activated and on an accessible route shall be operable with a single effort by lever type hardware, panic bars, push-pull activating bars or other hardware designed to provide passage without requiring the ability to grasp the opening hardware. Locked exit doors or gates shall operate consistent with Section 1126A.4, in the direction of egress. When sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

**Exception:** Access gates in barrier walls and fences protecting pools, spas, and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1372 mm) maximum above the finish floor or ground provided the self-latching devices are not also self-locking devices operated by means of a key, electronic opener, or integral combination lock.

**1126A.6.1 Lever type hardware.** The lever or lever of actuated latches or locks shall be curved with a return to within  $\frac{1}{2}$  inch (12.7 mm) of the door or gate to prevent catching on the clothing of persons during egress.

**Exception:** Group R and U occupancies with an occupant load of 10 or less.

**1126A.7 Smooth surface.** Swinging door or gate surfaces within 10 inches (254 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within  $\frac{1}{16}$  inch (1.6 mm) of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped.

**Exceptions:**

1. Automatic doors or gates.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at 60 degrees minimum from the horizontal.
3. Doors or gates that do not extend to within 10 inches (254 mm) of the finish floor or ground.

**1126A.8 Windows.** Where glazed openings are provided in accessible rooms or spaces for operation by occupants, at least one opening shall comply with Section 1138A.4.

Each glazed opening required by the enforcing agency to be operable shall comply with Section 1138A.4.

## SECTION 1127A COMMON USE FACILITIES

**Note:** For public use facilities, see Chapter 11B of this code.

**1127A.1 General.** When provided, common use areas and facilities in covered multifamily housing developments shall be accessible to persons with disabilities. Common use facilities include, but are not limited to, lobbies, toilet and bathing facilities, laundry facilities, community rooms, clubhouses, health and fitness facilities, game rooms and portions of common use tenant storage. All entrances, doors, fixtures and controls shall be on an accessible route. Facilities and fixtures required to be accessible shall comply with the following provisions:

1. **Doors.** Doors to accessible bathrooms shall comply with Section 1126A. Doors shall not swing into the floor space required for any fixture.
2. **Clear floor space.** All fixtures and controls shall be on an accessible route. Clear floor spaces at fixtures and controls, the accessible route and the turning space may overlap. This clear space shall comply with Sections 1138A.1.4 and 1138A.3.
3. **Water closets.** Where a toilet stall is provided, it shall comply with Section 1127A.2.1 or 1127A.2.2, and its water closet shall comply with Section 1127A.2.3.
4. **Lavatory and mirrors.** Where a lavatory and/or mirror is provided, it shall comply with Sections 1127A.3 and/or 1127A.8.3.
5. **Controls and dispensers.** Where controls, dispensers, receptacles or other types of equipment are provided, at least one of each shall be on an accessible route and shall comply with Sections 1127A.8 and 1138A.3.
6. **Bathing and shower facilities.** Where bathtubs or showers are provided, at least one fixture of each type provided shall be accessible per room. For bathtubs, see Section 1127A.5.2. For shower compartments, see Section 1127A.5.3.
7. **Toilet facilities.** Toilet facilities shall comply with Section 1127A.2.
8. **Laundry facilities.** Laundry facilities shall comply with Section 1127A.10.
9. **Storage facilities.** Storage facilities shall comply with Section 1127A.11.
10. **Fixed or built-in seating, tables and counters.** Fixed or built-in seating, tables and counters shall comply with Section 1127A.12.

**1127A.2 Toilet facilities.** When common use toilet facilities are provided for residents or guests, at least one percent of the total number of fixtures but not less than one of each type shall comply with this section.

**1127A.2.1 Multiple-accommodation toilet facilities.** Multiple-accommodation toilet facilities shall have the following:

**Note:** (See Figures 11A-9A and 11A-9B.)

1. **Wheelchair turning space.** Turning space of sufficient size to inscribe a circle with a diameter not less than 60 inches (1524 mm) or a T-shaped space shall be provided within the toilet facility. The wheelchair turning space shall comply with Section 1138A.1.3. Other than the door to the accessible water closet compartment, a door, in any position, may encroach into this space by not more than 12 inches (305 mm).

2. **Clear space at fixtures.** Doors shall not swing into the clear floor space required for any fixture. Required clear floor space, clearance at fixtures, and turning space shall be permitted to overlap.

3. **Accessible water closet compartment.** Accessible water closet compartments shall be 60 inches (1524 mm) wide minimum measured perpendicular to the side wall, 56 inches (1422 mm) deep minimum for wall hung water closets and 59 inches (1499 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. (See Figure 11A-9A(c).)

Water closet fixtures located in accessible water closet compartments shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 17 inches (432 mm) minimum to 18 inches (457 mm) maximum from the side wall or partition.

In ambulatory accessible toilet compartments specified in Item 6 of this section, the water closet shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum from the side wall or partition. (See Figure 11A-9A (d).)

Clearance around a water closet shall be 60 inches (1524 mm) minimum measured perpendicular from the side wall and 56 inches (1422 mm) minimum measured perpendicular from the rear wall. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

A minimum 48 inches (1219 mm) deep and 60 inches (1524 mm) wide clear maneuvering space shall be provided in front of the water closet if the compartment has an end-opening door (facing the water closet). A minimum 60 inches (1524 mm) deep and 60 inches (1524 mm) wide clear maneuvering space shall be provided in a compartment with the door located at the side. (See Figure 11A-9A.)

4. **Grab bars.** Grab bars shall be provided on the side wall closest to the water closet and on the rear wall. Grab bars shall comply with this section and Section 1127A.4.

The side wall grab bar shall be 42 inches (1067 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extend 54 inches (1372 mm) minimum from the rear wall. The front end of the side grab bar shall be positioned 24 inches (610 mm) minimum in front of the water closet.

The rear wall grab bar shall be 36 inches (914 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

### Exceptions:

1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, when wall space does not permit a length of 36 inches (914 mm) mini-

- mum due to the location of a recessed fixture adjacent to the water closet.*
2. When the enforcing agency requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.
  5. **Compartment doors.** Compartment doors shall comply with Section 1126A and the following:
    - 5.1. The water closet compartment shall be equipped with a door that has an automatic-closing device, and shall have a clear, unobstructed opening width of 32 inches (813 mm) when located at the end and 34 inches (864 mm) when located at the side with the door positioned at an angle of 90 degrees from its closed position.
    - 5.2. When standard compartment doors are used, with a minimum 9-inch (228.6 mm) clearance for footrests underneath and a self-closing device, clearance at the strike edge as specified in Section 1126A.3.2 is not required.
    - 5.3. The inside and outside of the compartment door shall be equipped with a loop or U-shaped handle immediately below the latch. The latch shall be flip-over style, sliding or other hardware not requiring the user to grasp or twist.
    - 5.4. Except for door-opening widths and door swings, a clear, unobstructed access of not less than 44 inches (1118 mm) shall be provided to water closet compartments designed for use by persons with disabilities, and the space immediately in front of a water closet compartment shall not be less than 48 inches (1219 mm) as measured at right angles to compartment door in its closed position.
    - 5.5. Doors shall be located in the front or in the side wall or partition farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (102 mm) maximum from the side wall or partition. Where located in the side wall or partition, the door opening shall be 4 inches (102 mm) maximum from the front wall or partition.
  6. **Ambulatory accessible compartments.** When six or more toilet compartments are provided within a multiple-accommodation toilet room, or when the combination of urinals and water closets totals six or more fixtures, at least one compartment shall comply with Section 1127A.2.1, Items 2 and 3. At least one additional ambulatory compartment shall have a depth of 60 inches (1524 mm) minimum, and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

The ambulatory accessible compartment shall have a self-closing door, which shall not swing into the minimum required compartment area. Grab bars, complying with Sections 1127A.4.2, 1127A.4.3, 1127A.4.4 and 1127A.4.5, shall be installed on each compartment side wall. (See Figure 11A-9A (d).)

**1127A.2.2 Single-accommodation toilet facilities.** Single-accommodation toilet facilities shall comply with the following:

**Note:** See Figures 11A-9A and 11A-9B.

1. **Wheelchair clearance.** There shall be sufficient space in the toilet room for a wheelchair measuring 30 inches (762 mm) wide by 48 inches (1219 mm) long to enter the room and permit the door to close. There shall be in the room a clear turning space of at least 60 inches (1524 mm) in diameter or a T-shaped space complying with Section 1138A.1.3. Required clear floor space, clearance at fixtures, and turning space shall be permitted to overlap.
2. **Encroachment of doors.** Doors shall not encroach into the turning space specified in Item 1 of this section by more than 12 inches (305 mm).
3. **Accessible water closet.** A water closet fixture located in a single-accommodation toilet facility shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 17 inches (432 mm) minimum to 18 inches (457 mm) maximum from the side wall or partition.

Clearance around a water closet shall be 60 inches (1524 mm) minimum measured perpendicular from the side wall and 56 inches (1422 mm) minimum measured perpendicular from the rear wall. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

A minimum 48 inches (1219 mm) deep and 60 inches (1524 mm) wide clear maneuvering space shall be provided in front of the water closet.

4. **Grab bars.** Grab bars shall be provided on the side wall closest to the water closet and on the rear wall. Grab bars shall comply with this section and Section 1127A.4.

The side wall grab bar shall be 42 inches (1067 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extend 54 inches (1372 mm) minimum from the rear wall. The front end of the side grab bar shall be positioned 24 inches (610 mm) minimum in front of the water closet.

The rear wall grab bar shall be 36 inches (914 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

**Exceptions:**

1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, when wall space does not permit a length of 36 inches (914 mm) minimum due to the location of a recessed fixture adjacent to the water closet.
2. When the enforcing agency requires flush controls for flush valves to be located in a position that conflicts with the location of the rear

grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.

5. **Accessible route.** All doors, fixtures and controls shall be on an accessible route. The minimum clear width of an accessible route shall be 36 inches (914 mm) except at doors (See Section 1126A). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as specified in Section 1138A.1.5.

**1127A.2.3 Water closets.** Water closets required to be accessible shall comply with the following:

**Note:** See Figure 11A-9B.

1. **Height.** The height of accessible water closets shall be a minimum of 17 inches (432 mm) to a maximum of 19 inches (483 mm) measured to the top of a maximum 2-inch-high (50.8 mm) toilet seat.
2. **Controls.** Flush controls shall be hand operated or automatic. Hand operated controls shall be operable with one hand and shall not require tight grasping, pinching or twisting. Controls for the flush valves shall be mounted on the open side of the water closet no more than 44 inches (1118 mm) above the floor. The force required to activate controls shall be no greater than 5 pounds (22.2 N).
3. **Toilet seats.** Seats shall not be sprung to return to a lifted position.

**1127A.2.4 Accessible urinals.** When urinals are provided, at least one shall comply with the following:

1. **Height and wall projection.** Urinals shall be floor mounted (stall type) or wall hung. The rim of the wall hung urinals shall be 17 inches (432 mm) maximum above the finish floor. Urinals (floor mounted and wall hung) shall be  $13\frac{1}{2}$  inches (343 mm) deep minimum measured from the outer face of the rim to the back of the fixture.
2. **Flush controls.** Flush controls shall be hand operated or automatic. Hand operated controls shall be operable with one hand, shall not require tight grasping, pinching or twisting of the wrist and shall be mounted no more than 44 inches (1118 mm) above the floor. The force required to activate controls shall be no greater than 5 pounds (22.2 N). Electronic automatic flushing controls are preferable.
3. **Clear floor space.** A clear floor space 30 inches by 48 inches (762 mm by 1219 mm) shall be provided in front of the urinal to allow forward approach. The clear floor space shall comply with Section 1138A.1.4.

**1127A.3 Accessible lavatories.** When common use lavatories are provided for residents or guests, at least one, and not less than 1 percent of all lavatories, shall comply with the following:

1. **Location.** Lavatories shall be installed with the centerline of the fixture a minimum of 18 inches (457 mm) horizontally from an adjoining wall, partition or fixture. The top of the fixture rim shall be a maximum of 34 inches (864 mm) above the finished floor.
2. **Floor space.** A clear floor space at least 30 inches by 48 inches (762 mm by 1219 mm) shall be provided in front of accessible lavatories to allow forward

approach. Such clear floor space shall adjoin or overlap an accessible route or another clear floor space.

3. **Knee and toe space.** A clear and obstructed knee and toe space, complying with Section 1138A.2, shall be provided underneath the lavatory. The knee and toe space shall be centered on the fixture. The clear floor space required by Item 2 shall not extend into the knee and toe space more than 19 inches (483 mm). (See Figure 11A-9D.)
4. **Finished floor.** The finished floor beneath the lavatory shall be extended to the wall.
5. **Plumbing protection.** Water supply and drain pipes under lavatories shall be insulated or otherwise covered to protect against contact. There shall be no sharp or abrasive surfaces under lavatories.
6. **Lavatory faucet controls.** Faucet controls and operation mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 pounds (22.2N). Lever operated, push type and electronically controlled mechanisms are examples of acceptable designs. Hand operated metering faucets are allowed if the faucet remains open for at least 10 seconds.

**1127A.4 Grab bars, tub and shower seats, fasteners and mounting devices.**

**1127A.4.1 General.** Grab bars, tub and shower seats, fasteners and mounting devices required by this chapter shall comply with this section.

**1127A.4.2 Location.** Grab bars shall be installed in a horizontal position, 33 inches (838 mm) minimum and 36 inches (914 mm) maximum above the finish floor measured to the top of the gripping surface.

**Exception:** The height of the lower grab bar on the back wall of a bathtub shall comply with Section 1127A.5.2.

**1127A.4.3 Diameter or width.** The diameter or width of the gripping surfaces of a grab bar shall comply with the following:

**Note:** See Figure 11A-9C.

1. **Circular cross section.** Grab bars with circular cross section shall have an outside diameter of  $1\frac{1}{4}$  inches (32 mm minimum and 2 inches (51 mm) maximum).
  2. **Noncircular cross section.** Grab bars with noncircular cross section shall have a cross-section dimension of 2 inches (51 mm) maximum. The perimeter dimension of grab bars with non-circular cross section shall be 4 inches (102 mm) minimum and 4.8 inches (122 mm) maximum.
  3. **Alternate configuration.** L-shaped or U-shaped grab bars shall be permitted.
- 1127A.4.4 Structural strength.** The structural strength of grab bars, tub and shower seats, fasteners and mounting devices shall meet the following specifications:
1. **Bending stress in a grab bar or seat induced by the maximum bending moment from the application of a 250-pound (1112 N) point load shall be less than the allowable stress for the material of the grab bar or seat.**
  2. **Shear stress induced in a grab bar or seat by the application of a 250-pound (1112N) point load shall**

be less than the allowable shear stress for the material of the grab bar or seat, and if its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall not exceed the allowable shear stress.

3. Shear force induced in a fastener or mounting device from the application of a 250-pound (1112 N) point load shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.
4. Tensile force induced in a fastener by a direct tension force of a 250-pound (1112 N) point load, plus the maximum moment from the application of a 250-pound (1112 N) point load, shall be less than the allowable withdrawal load between the fastener and supporting structure.
5. Grab bars shall not rotate within their fittings.

**1127A.4.5 Surface.** A grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements and shall have rounded edges.

**1127A.4.6 Spacing.** When grab bars are mounted adjacent to a wall, the space between the wall and the grab bars shall be  $1\frac{1}{2}$  inches (38 mm). (See Figure 11A-9C.) The space between the grab bar and projecting objects below and at the ends shall be  $1\frac{1}{2}$  inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.

**Exceptions:**

1. The space between the grab bars and shower controls, shower fittings, and other grab bars above shall be permitted to be  $1\frac{1}{2}$  inches (38 mm) minimum.
2. For L-shaped or U-shaped grab bars the space between the walls and the grab bar shall be  $1\frac{1}{2}$  inches (38 mm) minimum for a distance of 6 inches (152 mm) on either side of the inside corner between two adjacent wall surfaces.

**1127A.5 Bathing facilities.**

**1127A.5.1 General.** When common use bathing facilities are provided for residents or guests, including showers, bathtubs or lockers, at least one of each type of fixture in each facility, and not less than 1 percent of all fixtures, shall comply with this section.

**1127A.5.2 Bathtubs.** Bathtubs required to be accessible shall comply with the following:

**1127A.5.2.1 Floor space.** Clearance in front of bathtubs shall extend the length of the bathtub and shall be 48 inches (1219 mm) wide minimum for forward approach and 30 inches (762 mm) wide minimum for parallel approach. A lavatory complying with Section 1127A.3 shall be permitted at the control end of the clearance. When a permanent seat is provided at the head end of the bathtub, the clearance shall extend 12 inches (305 mm) minimum beyond the wall at the head end of the bathtub. (See Figure 11A-9E.)

**1127A.5.2.2 Seat.** A removable in-tub seat or a permanent seat at the head end of the tub shall be provided. The structural strength of seats and their attachments shall comply with Section 1127A.4.4. Seats shall be mounted securely and shall not slip during use.

The top of bathtub seats shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum above the bathroom finish floor. The depth of a removable in-tub seat shall be 15 inches (381 mm) minimum and 16 inches (406 mm) maximum. Permanent seats at the head end of the bathtub shall be 15 inches (381 mm) deep minimum and shall extend from the back wall to or beyond the outer edge of the bathtub. (See Figure 11A-9E.)

**1127A.5.2.3 Grab bars.** Grab bars complying with Section 1127A.4 shall be provided in accordance with this section. (See Figure 11A-9F.) When separate grab bars are required on adjacent walls at a common mounting height, an L-shaped or U-shaped grab bar meeting the dimensional requirements of this section shall be permitted.

**1. Bathtubs with permanent seats.** Two horizontal grab bars shall be installed on the back wall. One shall be located 33 inches (838 mm) minimum and 36 inches (914 mm) maximum above the finish floor measured to the top of the gripping surface, and the other shall be located 8 inches (203 mm) minimum and 10 inches (254 mm) maximum above the rim of the bathtub. Each grab bar shall be 48 inches (1219 mm) long minimum, and shall be installed 15 inches (381 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

**2. Bathtubs with removable seats.** Two horizontal grab bars shall be installed on the back wall. One shall be located 33 inches (838 mm) minimum and 36 inches (914 mm) maximum above the finish floor measured to the top of the gripping surface, and the other shall be located 8 inches (203 mm) minimum and 10 inches (254 mm) maximum above the rim of the bathtub. Each grab bar shall be 24 inches (610 mm) long minimum and shall be installed 24 inches (610 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub. A grab bar 12 inches (305 mm) long minimum shall be installed on the head end wall at the front edge of the bathtub.

**1127A.5.2.4. Controls.** Faucets and controls (other than drain stoppers) shall be located on an end wall between the bathtub rim and grab bar, and between the open side of the bathtub and the centerline of the width of the bathtub. (See Figure 11A-9F.)

Controls shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 pounds (22.2 N).

**1127A.5.2.5 Shower spray unit.** A shower spray unit with a hose at least 59 inches (1524 mm) long that can be used both as a fixed shower head and as a hand-held shower shall be provided.

The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height

shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of the grab bars.

**1127A.5.2.6 Bathtub enclosures.** When provided, enclosures for bathtubs shall not obstruct controls, faucets, shower and spray units, or obstruct transfer from wheelchairs onto bathtub seats or into bathtubs. Enclosures on bathtubs shall not have tracks installed on the rim of the open face of the bathtub.

**1127A.5.3 Shower compartments.** Shower compartments required to be accessible shall comply with this section. (See Figures 11A-9H, 11A-9I, 11A-9J and 11A-9K.)

#### 1127A.5.3.1 Size and clearance.

**1. Standard roll-in shower compartments.** Standard roll-in shower compartments shall meet one of the following:

- 1.1 30 inches (762 mm) minimum in depth and 60 inches (1524 mm) minimum in width between wall surfaces measured at center points of opposing sides, with a full opening width on the long side.

A clear floor space 30 inches (914 mm) minimum by 60 inches (1524 mm) minimum shall be provided adjacent to the open face of the shower compartment.

- 1.2. 42 inches (1067 mm) in width between wall surfaces, and 48 inches (1219 mm) minimum in depth with an entrance opening of 42 inches (1067 mm).

**2. Alternate roll-in shower compartments.** Alternate roll-in shower compartments shall be 36 inches (914 mm) minimum in depth and 60 inches (1524 mm) minimum in width between wall surfaces measured at center points of opposing sides. A 36-inch (914 mm) wide minimum entry shall be provided at one end of the long side of the compartment.

**1127A.5.3.2 Thresholds.** Thresholds in roll-in shower compartments shall be  $\frac{1}{2}$  inch (12.7 mm) maximum in height and shall be beveled with a slope no greater than one unit vertical in two units horizontal (50-percent slope). (See Figure 11A-1F.)

**Exception:** Changes in level not exceeding  $\frac{1}{4}$  inch (6.35 mm) shall be permitted to be vertical.

**1127A.5.3.3 Enclosures.** Enclosures, when provided for shower compartments, shall not obstruct controls, faucets, shower spray units, and transfer from wheelchairs onto shower seats.

**1127A.5.3.4 Floor.** Shower compartment floor surfaces shall be stable, firm and slip resistant. The maximum slope of the floor shall be  $\frac{1}{4}$  inch (6.35 mm) per foot (2.083 percent slope) in any direction. When drains are provided, grate openings shall be  $\frac{1}{4}$  inch (6.35 mm) maximum and located flush with the floor surface.

**1127A.5.3.5 Controls.** Controls, faucets and shower spray units in shower compartments shall be operable with one hand, and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum. All controls and faucets shall be of a single-lever design.

**1127A.5.3.5.1 Standard roll-in shower compartments.** In standard roll-in shower compartments, operable parts of controls and faucets shall be

installed on the back wall of the compartment adjacent to the seat wall, 19 inches (483 mm) minimum and 27 inches (686 mm) maximum from the seat wall.

Operable parts of controls and faucets shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor, with their centerline at 39 inches (991 mm) minimum and 41 inches (1041 mm) maximum above the shower floor.

Operable parts of the shower spray unit, including the handle, shall be installed on the back wall adjacent to the seat wall, 19 inches (483 mm) minimum and 27 inches (686 mm) maximum from the seat wall.

Operable parts of the shower spray unit, including the handle, shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor (measured to the top of the mounting bracket).

**1127A.5.3.5.2 Alternate roll-in shower compartments.** In alternate roll-in shower compartments, operable parts of controls and faucets shall be installed on the side wall of the compartment adjacent to the seat wall, 19 inches (483 mm) minimum and 27 inches (686 mm) maximum from the seat wall.

Operable parts of controls and faucets shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor, with their centerline at 39 inches (991 mm) minimum and 41 inches (1041 mm) maximum above the shower floor.

Operable parts of the shower spray unit, including the handle, shall be installed on the following locations:

1. On the side wall of the compartment adjacent to the seat wall, 17 inches (432 mm) minimum and 19 inches (483 mm) maximum from the seat wall; or
2. On the back wall opposite the seat, 15 inches (381 mm) maximum, left or right, of the centerline of the seat.

Operable parts of the shower spray unit, including the handle, shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor.

**1127A.5.3.6 Hand-held shower sprayer unit.** A flexible hand-held shower spray unit with a hose at least 59 inches (1524 mm) long that can be used both as a fixed shower head and as a hand-held shower shall be provided.

The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars.

**1127A.5.3.6.1 Sprayer unit alternative.** When accessible shower facilities are provided in areas subject to excessive vandalism, in lieu of providing the fixed flexible hose, two wall-mounted shower heads shall be installed. Each shower head shall be installed so that it can be operated independently of the other and shall have swivel angle adjustments, both vertically and horizontally. One shower head shall be located at a height of 48 inches (1219 mm) maximum above the floor.

**1127A.5.3.7 Shower compartment seats.** A seat in a standard roll-in shower compartment shall be a folding type, installed on the side wall adjacent to the controls.

The seat shall extend from the back wall to a point within 3 inches (76 mm) of the compartment entry. A seat in an alternate roll-in type shower compartment shall be a folding type, installed on the front wall opposite the back wall, and shall extend from the adjacent side wall to a point within 3 inches (76 mm) of the compartment entry.

Shower compartment seats shall comply with Section 1127A.4.4 and shall be located within 27 inches (686 mm) of the shower controls. The top of the seat shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum above the bathroom finish floor. When folded, the seat shall not extend more than 6 inches (152 mm) from the mounting wall.

**1127A.5.3.7.1 Rectangular seats.** The rear edge of a rectangular seat shall be  $2\frac{1}{2}$  inches (64 mm) maximum from the seat wall. The front edge of a rectangular seat shall be 15 inches (381 mm) minimum and 16 inches (406 mm) maximum from the seat wall. The side edge of the seat shall be  $1\frac{1}{2}$  inches (38 mm) maximum from the adjacent wall.

**1127A.5.3.7.2 L-shaped seats.** The rear edge of an L-shaped seat shall be  $2\frac{1}{2}$  inches (64 mm) maximum from the seat wall. The front edge of an L-shaped seat shall be 15 inches (381 mm) minimum and 16 inches (406 mm) maximum from the seat wall. The rear edge of the "L" portion of the seat shall be  $1\frac{1}{2}$  inches (38 mm) maximum from the wall. The front edge shall be 14 inches (356 mm) minimum and 15 inches (381 mm) maximum from the wall. The end of the "L" shall be 22 inches (559 mm) minimum and 23 inches (584 mm) maximum from the main seat wall.

**1127A.5.3.8 Grab bars.** Accessible shower compartments shall be provided with grab bars, installed in accordance with Section 1127A.5.3.8.1 or Section 1127A.5.3.8.2. Grab bars shall also comply with Section 1127A.4.

When multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the finish floor. When separate grab bars are required on adjacent walls at a common mounting height, L-shaped or U-shaped grab bars meeting the dimensional requirements of Section 1127A.5.3.8.1 or Section 1127A.5.3.8.2 shall be permitted. (See Figure 11A-9H or Figure 11A-9I.)

**1127A.5.3.8.1 Standard roll-in shower compartments.** Grab bars shall be installed on the back wall and on the side wall opposite the seat. Grab bars above the seat are not permitted. Grab bars shall be installed 6 inches (152 mm) maximum from adjacent walls.

**1127A.5.3.8.2 Alternate roll-in shower compartments.** Grab bars shall be installed on the back wall and the side wall farthest from the compartment entry. Grab bars above the seat are not permitted. Grab bars shall be installed 6 inches (152 mm) maximum from adjacent walls.

**1127A.5.3.9 Soap dish.** When a soap dish is provided, it shall be located on the control wall at a maximum height of 40 inches (1016 mm) above the shower floor, and within the reach limits from the seat.

**1127A.5.3.10 Open showers.** When no separate shower compartments are provided, the shower for persons with disabilities shall be located in a corner with L-shaped grab bars extending along two adjacent walls

with a folding seat adjacent to the shower controls. (See Figure 11A-9J.)

**1127A.5.3.11. Multiple showers.** When two or more accessible showers are provided within the same functional area, there shall be at least one shower constructed opposite hand from the other or others (i.e., one left-hand control versus right-hand controls).

## 1127A.6 Lockers.

**1127A.6.1 General.** Where lockers are provided for residents or guests, at least one locker and not less than 1 percent of all lockers shall be accessible to persons with disabilities. An accessible route not less than 36 inches (914 mm) in clear width shall be provided to these lockers. See Section 1138A for required clear space, allowable reach ranges and requirements for control and operating mechanisms.

## 1127A.7 Signs.

**1127A.7.1 General.** All accessible toilet and bathing facilities shall be identified by the "International Symbol of Accessibility." Signs need not be provided for facilities within a dwelling unit or guestroom.

**1127A.7.2 Identification symbols.** Doorways leading to sanitary facilities (toilet or bathing rooms) shall be identified by a geometric symbol in compliance with this section. Geometric symbols shall be centered horizontally on the door at a height of 58 inches (1473 mm) minimum and 60 inches (1524 mm) maximum above the finish floor measured to the center of the symbol. When a door is provided, the symbol shall be mounted within 1 inch (25 mm) of the vertical centerline of the door. Directional signs indicating the location of the nearest accessible toilet or bathing rooms shall be provided. Such directional signs shall comply with Section 1143.5 and shall include the International Symbol of Accessibility.

Edges of accessibility signage shall be rounded, chamfered or eased. Corners shall have a minimum radius of  $\frac{1}{8}$  inch (3.2 mm). See Section 1143A for additional signage requirements applicable to sanitary facilities.

**1127A.7.2.1 Men's sanitary facilities.** Men's sanitary facilities shall be identified by an equilateral triangle,  $\frac{1}{4}$  inch (6.4 mm) thick with edges 12 inches (305 mm) long and a vertex pointing upward. The triangle symbol shall contrast with the door, either light on a dark background or dark on a light background.

**1127A.7.2.2 Women's sanitary facilities.** Women's sanitary facilities shall be identified by a circle,  $\frac{1}{4}$  inch (6.4 mm) thick and 12 inches (305 mm) in diameter. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background.

**1127A.7.2.3 Unisex sanitary facilities.** Unisex sanitary facilities shall be identified by a circle,  $\frac{1}{4}$  inch (6.4 mm) thick and 12 inches (305 mm) in diameter with a  $\frac{1}{4}$  inch (6.4 mm) thick triangle superimposed on the circle and within the 12-inch (305 mm) diameter. The triangle symbol shall contrast with the circle symbol, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background.

## 1127A.8 Toilet room fixtures and accessories.

**1127A.8.1 Towel, sanitary napkins, waste receptacles.** Where towel, sanitary napkins, waste receptacles and other similar dispensing and disposal fixtures are pro-

vided, at least one of each type shall be located with all operable parts, including coin slots, within 40 inches (1016 mm) from the finished floor. Controls and operating mechanisms shall comply with Section 1138A.4.

**1127A.8.2 Toilet tissue dispensers.** Toilet tissue dispensers shall be located on the wall or partition closest to the water closet, 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be below the grab bar, 19 inches (483 mm) minimum above the finish floor. The outlet of the dispenser shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow. (See Figure 11A-9B.)

**1127A.8.3 Mirrors.** Where mirrors are provided, at least one shall be accessible. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1016 mm) maximum above the finish floor. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (889 mm) maximum above the finish floor.

#### **1127A.9 Space allowances and reach ranges in common use areas.**

Space allowances and reach ranges in common use areas shall comply with Section 1138A.

#### **1127A.10 Common accessible laundry rooms.**

**1127A.10.1 General.** Where common use laundry rooms are provided, at least one of each type of appliance provided in each laundry area shall be accessible, shall be on an accessible route and shall comply with this section. Such appliances include clothes washing machines, dryers, soap dispensers and any related features such as wash sinks, tables and storage areas.

Where laundry rooms are provided on floors of an elevator building, each laundry room shall be accessible. Where there is one laundry room on a ground floor in each building, each laundry room shall be accessible. Where there is a laundry room on the ground floor of a building and another located in the basement, it is acceptable to have only the ground floor laundry room accessible.

**1127A.10.2 Clear floor space.** There shall be a minimum clear space 30 inches perpendicular by 48 inches parallel (762 mm by 1219 mm) in front of clothes washers and dryers required to be accessible. There shall be a minimum clear space 30 inches by 48 inches (762 mm by 1219 mm) provided for at least one of each type of fixture or appliance provided in the laundry room (e.g., soap dispensers, wash sinks, tables, storage areas).

**1127A.10.3 Controls and operating mechanisms.** Clothes washers and dryers including stacked clothes washers and dryers required to be accessible shall have controls and operating mechanisms (including doors, coin slots, lint screens, detergent and bleach compartments) within the reach range of a seated user. Controls and operating mechanisms shall be located no higher than 48 inches (1219 mm), and no lower than 15 inches (381 mm), above the finished floor measured to the center of the grip. If the reach is over an obstruction (for example, washer or dryer), operating mechanisms shall be located within the reach ranges specified in Section 1138A.3. Controls and

operating mechanisms that do not satisfy these specifications are acceptable, provided that comparable mechanisms, controls or outlets that perform the same functions are provided within the same area and are accessible.

Controls and operating mechanisms shall be operable with one hand and not require tight grasping, pinching or twisting of the wrist. The force required to activate controls and operating mechanisms shall be no greater than 5 pounds (22.2N).

#### **1127A.10.4 Washing machines and clothes dryers.** Washing machines and clothes dryers in accessible common use laundry rooms shall be front loading.

The bottom of the opening to the laundry compartment shall be located 15 inches (381 mm) minimum and 36 inches (914 mm) maximum above the finish floor.

#### **1127A.11 Storage.**

**1127A.11.1 General.** If fixed storage facilities such as cabinets, shelves, closets or drawers are provided where access is required by Sections 1.8.2.1.2 and 1102A, at least one of each type of facility provided shall comply with this section. Additional storage may be provided outside of the reach ranges specified in Section 1138A.3.

**1127A.11.2 Clear floor space.** A clear floor space at least 30 inches by 48 inches (762 mm by 1219 mm) complying with Section 1138A.1.4 that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

**1127A.11.3 Height.** Accessible storage spaces and clothes rods shall be within at least one of the reach ranges specified in Section 1138A.3. (See Figure 11A-1J and Figure 11A-II.)

**1127A.11.4 Hardware.** Hardware for accessible storage facilities shall comply with Section 1138A.4. Touch latches and U-shaped pulls are acceptable.

#### **1127A.12 Fixed or built-in seating, tables and counters.**

**1127A.12.1 Minimum seating.** Where fixed or built-in seating, tables or counters are provided for residents or guests, 5 percent, but not less than one, shall be accessible as provided in this section.

**1127A.12.2 Clear floor space.** When seating spaces for persons in wheelchairs are provided at fixed tables or counters, clear floor space complying with Section 1138A.1.4 positioned for a forward approach shall be provided. Such clear floor space shall not overlap the required knee and toe space by more than 19 inches (483 mm). (See Figure 11A-1K.)

**1127A.12.3 Knee and toe space.** When seating for persons in wheelchairs is provided at fixed tables or counters, knee and toe space complying with Section 1138A.2 shall be provided. (See Figure 11A-1K.)

**1127A.12.4 Height of work surfaces.** The tops of tables and counters shall be 28 inches to 34 inches (711 mm to 864 mm) from the finish floor.

**Exception:** When food or drink is served for consumption at a counter exceeding 34 inches (864 mm) in height, only a portion of the main counter, 60 inches (1524 mm) minimum in length, shall be provided in compliance with this section.

#### **1127A.13 Electric vehicle charging stations. (Reserved)**

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### **SECTION 1128A COVERED DWELLING UNITS**

**1128A.1 General.** Covered multifamily dwelling units shall be adaptable and accessible into and throughout the dwelling unit as provided in this division.

**Note:** See Sections 1101A “Application” and 1102A “Building Accessibility” for dwelling units required to comply with this division.

### **SECTION 1129A Reserved**

### **SECTION 1130A ACCESSIBLE ROUTE WITHIN COVERED MULTIFAMILY DWELLING UNITS**

**1130A.1 General.** An accessible route shall be provided through all rooms and spaces of the dwelling unit. The accessible route shall pass through the primary entry door, and shall connect with all additional exterior doors, required clear floor spaces at kitchen appliances and bathroom fixtures. For the purpose of this section, “accessible routes” may include hallways, corridors and ramps.

**Exception:** An accessible route is not required from the interior of the unit into a basement or garage, except as provided in Section 1105A.1.

**1130A.2 Width.** The accessible route into and throughout covered multifamily dwelling units shall be at least 36 inches (914 mm) wide.

### **SECTION 1131A CHANGES IN LEVEL ON ACCESSIBLE ROUTES**

**1131A.1 Changes in level not exceeding  $\frac{1}{2}$  inch.** Abrupt changes in level along any accessible route shall not exceed  $\frac{1}{2}$  inch (12.7 mm). When changes in level do occur, they shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50-percent slope). Changes in level not exceeding  $\frac{1}{4}$  inch (6.35 mm) may be vertical.

**1131A.2 Changes greater than  $\frac{1}{2}$  inch.** Changes in level greater than  $\frac{1}{2}$  inch (12.7 mm) shall be made by means of a sloped surface not greater than 1 unit vertical in 20 units horizontal (5-percent slope), or a ramp, elevator or platform

(wheelchair) lift. See Section 1122A for ramps and Section 1124A.11 for platform (wheelchair) lifts.

### **SECTION 1132A DOORS**

**1132A.1 Primary entry doors and required exit doors.** The width and height of primary entry doors and all required exit doors shall comply with Section 1126A.1. The requirements of Sections 1126A.3 shall apply to maneuvering clearances at the side of the door exposed to common or public use spaces (e.g., entry or exit doors which open from the covered multifamily dwelling unit into a corridor, hallway or lobby, or directly to the outside).

**1132A.2 Interior doors and secondary exterior doors.** Except as allowed by Section 1109A.2, interior doors intended for user passage and secondary exterior doors shall comply with this section. The provisions of this section shall apply to the dwelling unit side of doors leading from the interior of the dwelling unit to an unfinished basement or an attached garage.

**1132A.3 Width and height of interior doors and secondary exterior doors.** Doors shall comply with the following:

1. Doors shall not be less than 6 feet 8 inches (2032 mm) in height.
2. Swinging doors shall provide a net clear opening width of not less than 32 inches (813 mm), measured with the door or doors positioned at an angle of 90 degrees from the closed position.
3. Swinging doors shall be capable of opening at least 90 degrees.
4. A nominal 32-inch (813 mm) clear opening provided by a standard 6-foot wide (1829 mm) sliding patio door assembly is acceptable.
5. A pair of doors, manual or automatic, must have at least one leaf which provides a clear width of not less than 32 inches (813 mm), measured with the door positioned at an angle of 90 degrees from its closed position.
6. The width of any component in the means of egress system shall not be less than the minimum width required by Section 1005.

**1132A.4 Level floor or landing.** See also Chapter 10. The floor or landing on each side of a door shall be level. Primary entry doors, required exit doors or secondary exterior doors with changes in height between the interior surface or floor level and the exterior surface or floor level shall comply with the following:

1. Exterior landings of impervious construction (e.g., concrete, brick, flagstone) serving primary entry doors and required exit doors are limited to not more than  $\frac{1}{2}$  inch (12.7 mm) of change in height between floor surfaces. Changes in level shall comply with Section 1131A.
2. Exterior landings of pervious construction (e.g., wood decking with spaces) shall be the same level as the interior landing, except that secondary exterior doors may have no more than  $\frac{1}{2}$  inch (12.7 mm) of change in height between floor surfaces. Changes in level shall comply with Section 1131A.

3. Secondary exterior doors onto decks, patios or balcony surfaces constructed of impervious materials (e.g., concrete, brick, flagstone) may have a maximum change in height from the interior landing of 4 inches (101.6 mm). Changes in height greater than  $\frac{1}{2}$  inch (12.7 mm) shall be accomplished by means of a ramp complying with Section 1114A or by means of a platform constructed to the level of the floor as illustrated in Figure 11A-8J.
4. Secondary exterior doors onto decks, patios or balcony surfaces constructed of impervious materials (e.g., concrete, brick, flagstone) may have a maximum change in height from the interior landing of 1 inch (25.4 mm), provided a ramp with a maximum slope of 1:8 is permanently installed. (See Figure 11A-8K.)
5. In buildings containing covered multifamily dwelling units, the floor or landing immediately outside the entry may be sloped up to  $\frac{1}{4}$  inch (6.35 mm) per foot (12 inches) (305 mm), in a direction away from the primary entrance of the dwelling unit for drainage.

**1132A.4.1 Thresholds.** Thresholds at the primary entry and required exit doors shall be no higher than  $\frac{1}{2}$  inch (12.7 mm). Thresholds at secondary exterior doors, including sliding door tracks, shall be no higher than  $\frac{3}{4}$  inch (19.05 mm). Changes in height at interior door thresholds (e.g., floor material changes at door thresholds) shall not exceed  $\frac{1}{2}$  inch (12.7 mm). Thresholds shall comply with the following:

1. Thresholds with a change in height of not more than  $\frac{1}{4}$  inch (6.35 mm) may be vertical.
2. Thresholds with a change in height between  $\frac{1}{4}$  inch (6.35 mm) and  $\frac{3}{4}$  inch (19.05 mm) shall be beveled with a slope no greater than 1 unit vertical in 2 units horizontal (50-percent slope).

#### 1132A.5 Maneuvering clearances at doors.

**1132A.5.1 General.** The floor or landing on the dwelling unit side of the primary entry door and any required exit door shall have a minimum length of not less than 44 inches (1118 mm). Section 1126A.3 shall apply to maneuvering clearances at the side of the door exposed to common or public use spaces.

Maneuvering clearances at interior doors shall provide a minimum length on both sides of the door of at least 42 inches (1067 mm) measured at a right angle to the plane of the door in its closed position.

**Exception:** A 39-inch (991 mm) length is acceptable at interior doors when a minimum clear opening width of 34 inches (864 mm) is provided.

**1132A.5.2 Strike edge maneuvering space at doors.** The width of the level area on the side to which the door swings shall extend 18 inches (457 mm) past the strike edge for all doors. The width of the level area at the exterior side of the primary entry door and any required exit doors shall comply with Section 1126A.

#### Notes:

1. See Section 1134A for bathrooms that are required to be accessible.
2. Twenty-four inches (610 mm) is preferred for strike edge clearance.

**1132A.6 Closer-effort to operate doors.** Maximum effort to operate doors shall not exceed  $8\frac{1}{2}$  pounds (38 N) for exterior doors and 5 pounds (22 N) for interior doors, such pull or push effort being applied at right angles to hinged doors and at the center plane of sliding or folding doors. Compensating devices or automatic door operators may be utilized to meet these standards. When fire doors are required, the maximum effort to operate the door may be increased to the minimum allowable by the appropriate enforcement agency, not to exceed 15 pounds (66.7 N).

**1132A.7 Type of lock or latch.** The type of latch and lock required for all doors shall be in accordance with Section 1132A.8 and Chapter 10, Section 1008.

**1132A.8 Hand-activated door hardware.** Hand-activated door latching, locking and opening hardware shall be centered between 30 inches (762 mm) and 44 inches (1118 mm) above the floor. Latching and locking doors that are hand-activated and on an accessible route shall be operable with a single effort by lever-type hardware, panic bars, push-pull activating bars or other hardware designed to provide passage without requiring the ability to grasp the opening hardware. Locked exit doors shall operate consistent with Section 1132A.6, in the direction of egress.

**1132A.8.1 Lever-type hardware.** The lever or lever of actuated latches or locks shall be curved with a return to within  $\frac{1}{2}$  inch (12.7 mm) of the door to prevent catching on the clothing of persons during egress in Group R and U occupancies with an occupant load greater than 10.

**1132A.9 Smooth surface.** Swinging door or gate surfaces within 10 inches (254 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within  $\frac{1}{16}$  inch (1.6 mm) of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped.

#### Exceptions:

1. Automatic doors.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at 60 degrees minimum from the horizontal.
3. Doors or gates that do not extend to within 10 inches (254 mm) of the finish floor.

**1132A.10 Door signal devices.** Every primary entrance to a covered multifamily dwelling unit shall be provided with a door buzzer, bell, chime or equivalent. The activating mechanism shall be mounted a maximum of 48 inches (1219 mm) above the floor and connected to permanent wiring.

## SECTION 1133A KITCHENS

**1133A.1 General.** Kitchens shall be on an accessible route and shall comply with this section. (See Figure 11A-10A.)

**1133A.2 Clear floor space.** Clear floor space at kitchens shall comply with the following:

1. A clear floor space at least 30 inches (762 mm) by 48 inches (1219 mm) that allows a parallel approach by a

person in a wheelchair shall be provided at the range or cooktop.

2. A clear floor space at least 30 inches (762 mm) by 48 inches (1219 mm) that allows either a parallel or forward approach shall be provided at the kitchen sink and all other fixtures or appliances including the oven, dishwasher, refrigerator/freezer and trash compactor.
3. A clear floor space at least 30 inches (762 mm) by 48 inches (1219 mm) that allows either a parallel or a forward approach shall be provided at the work surface required by Section 1133A.4.
4. The centerline of the 30-inch (762 mm) by 48-inch (1219 mm) clear floor space provided for parallel or forward approach shall be aligned with the centerline of the work space, appliance or fixture.

**1133A.2.1 Clear width.** Kitchens shall have a minimum clear width measured between any cabinet, countertop or the face of any appliance (excluding handles and controls) that projects into the kitchen and the opposing cabinet, countertop, appliance or wall as follows:

1. U-shaped kitchens, designed with parallel approach at a range or cooktop located at the base of the U, shall have a minimum clear width of at least 60 inches (1524 mm). (See Figure 11A-10A.)
2. U-shaped kitchens, designed with a cooktop or sink located at the base of the U, which provides a knee and toe space in accordance with Section 1133A.7 to allow for a forward approach, shall have a clear width of at least 48 inches (1219 mm). (See Figure 11A-10A.)
3. All other kitchen designs shall provide a minimum clear width of at least 48 inches (1219 mm). (See Figure 11A-10A.)

**1133A.3 Removable base cabinets.** Sinks and work surfaces required by Section 1133A.4 (see Item 1 and Item 2) shall be provided with knee and toe space complying with Section 1133A.7. Base cabinets (including toeboard and shelving) directly under kitchen sinks and work surfaces shall be removable without the use of specialized tools or specialized knowledge in order to provide knee and toe space. The finish floor beneath kitchen sinks and work surfaces shall be extended to the wall.

**1133A.4 Countertops.** Kitchen countertops shall comply with this section and shall be provided with the following:

1. A minimum linear length of 30 inches (762 mm) of countertop shall be provided for the kitchen sink installation.
2. A minimum linear length of 30 inches (762 mm) of countertop shall be provided for a work surface.
3. Sinks and work surfaces may be a single integral unit a minimum of 60 inches (1524 mm) in length, or be separate components.

**Exception:** Two 15-inch (381 mm) wide minimum breadboards may be provided in lieu of the required 30 inches (762 mm) of countertop work surface.

**1133A.4.1 Repositionable countertops.** Repositionable countertops shall be provided in a minimum of 5 percent of the covered multifamily dwelling units. Repositionable countertops shall comply with the following:

1. Sinks and work surfaces required by Section 1133A.4 shall be designed to enable repositioning to a minimum height of 28 inches (711 mm).
2. Base cabinets directly under sinks and work surfaces shall be removable as required in Section 1133A.3.
3. The sides of adjacent cabinets and the back wall, which may become exposed to moisture or food handling when a countertop is lowered, shall be constructed of durable, nonabsorbent materials appropriate for such uses.
4. Finished flooring shall be extended to the wall beneath the sink and work surface.

#### Exceptions:

1. Stone, cultured stone and tiled countertops may be used without meeting the repositioning requirements.
2. Two 15-inch (381 mm) wide minimum breadboards may be provided in lieu of the required 30 inches (762 mm) of countertop work surface, and used without meeting the repositioning requirements.

**1133A.5 Lower shelving.** Lower shelving and/or drawer space shall be provided in the kitchen at a height of no more than 48 inches (1219 mm) above the floor.

**1133A.6 Kitchen sink faucet controls.** Faucet controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist.

The force required to activate controls shall be no greater than 5 pounds (22.2N). Lever-operated, push-type and electronically controlled mechanisms are examples of acceptable designs. Self-closing valves are allowed if the faucet remains open for at least 10 seconds.

**1133A.7 Knee and toe space.** Knee and toe space, when required by Section 1133A, shall comply with Section 1138A.2 and the following:

1. The knee and toe space shall be clear and unobstructed, or removable base cabinets in compliance with Section 1133A.3 shall be provided.
2. The knee and toe space shall be 30 inches (762 mm) wide minimum, centered on the sink, countertop or appliance.
3. A clear floor space shall not extend into the knee and toe space more than 19 inches (483 mm).

**1133A.7.1 Plumbing protection.** Water supply and drain pipes under kitchen sinks shall be insulated or otherwise covered to protect against contact. There shall be no sharp or abrasive surfaces under kitchen sinks.

## SECTION 1134A BATHING AND TOILET FACILITIES

**1134A.1 General.** All bathrooms, bathing and toilet facilities within covered multifamily dwelling units shall comply with this section.

**1134A.2 Number of complying bathrooms.** Bathrooms shall be designed to comply with one of the following options:

**Option 1.** All bathrooms within the dwelling unit shall be designed to comply with the following:

1. Toilet, bathing and shower facilities shall comply with Section 1134A.4.
2. Bathtubs shall comply with Section 1134A.5.
3. Showers shall comply with Section 1134A.6.
4. Water closets shall comply with Section 1134A.7.
5. Lavatories, vanities, mirrors and towel fixtures shall comply with Section 1134A.8.
6. Bathrooms shall be provided with an accessible route into and through the bathroom.
7. If a door is provided, it shall comply with the requirements of Section 1132A.5.
8. A minimum 18-inch (457 mm) clear maneuvering space shall be provided on the swing side of the door at the strike edge of the door.
9. Switches, outlets and controls shall comply with Section 1142A.
10. Reinforced walls to allow for the future installation of grab bars around the toilet, tub and shower shall comply with Sections 1134A.5 for bathtubs, 1134A.6 for showers and 1134A.7 for water closets. Grab bars shall comply with Sections 1127A.4 and 1127A.2.2, Item 4.

**Option 2.** Only one bathroom within the dwelling unit shall be designed to comply with the following:

1. Toilet, bathing and shower facilities shall comply with Section 1134A.4.
2. Bathtubs shall comply with Section 1134A.5.
3. Showers shall comply with Section 1134A.6.
4. Water closets shall comply with Section 1134A.7.
5. Lavatories, vanities, mirrors and towel fixtures shall comply with Section 1134A.8.
6. Where both a tub and shower are provided in the bathroom, at least one shall be made accessible. Additional requirements apply to dwelling units containing two or more bathrooms when a bathtub is provided as the accessible bathing fixture.

Where two or more bathrooms are provided within the same dwelling unit and a bathtub is installed to comply with Option 2, Item 6 in one bathroom and a shower stall is provided in a subsequent bathroom, both the bathtub selected to comply with Option 2, Item 6 and at least one shower stall within the dwelling unit shall meet all the applicable accessibility requirements provided

in Section 1134A. (See Section 1134A.5 for bathtubs, or Section 1134A.6 for showers.)

7. When two or more lavatories are provided, at least one shall be made accessible and comply with Section 1134A.8.
8. Bathrooms shall be provided with an accessible route into and through the bathroom.
9. If a door is provided, it shall comply with the requirements of Section 1132A.5.
10. A minimum 18-inch (457 mm) clear maneuvering space shall be provided on the swing side of the door at the strike edge of the door.
11. Switches, outlets and controls shall comply with Section 1142A.
12. Reinforced walls to allow for the future installation of grab bars around the toilet, tub and shower shall comply with Sections 1134A.5 for bathtubs, 1134A.6 for showers and 1134A.7 for water closets. Grab bars shall comply with Sections 1127A.4 and 1127A.2.2, Item 4.

When Option 2 is used, all additional bathrooms must comply with Items 8 through 12 above.

**1134A.3 Powder rooms.** All powder rooms shall be designed to comply with Section 1134A.2, Option 2, Items 8 through 12. When the powder room is the only toilet facility located on an accessible level, it shall comply with the Option 2 items listed above, plus all additional requirements located in Sections 1134A.4, 1134A.7 and 1134A.8.

**1134A.4 Sufficient maneuvering space.** Bathing and toilet facilities required to be adaptable shall provide sufficient maneuvering space for a person using a wheelchair or other mobility aid to enter and close the door, use the fixtures, reopen the door and exit.

Where the door swings into the bathroom or powder room, there shall be a clear maneuvering space outside the swing of the door of at least 30 inches by 48 inches (762 mm by 1219 mm) within the room. The clear maneuvering space shall allow the user to position a wheelchair or other mobility aid clear of the path of the door as it is closed and to permit use of fixtures.

Doors may swing into the required clear space at any fixture when a clear maneuvering space is provided outside the swing arc of the door so it can be closed.

Maneuvering spaces may include any knee space or toe space available below bathroom fixtures.

**1134A.5 Bathtubs.** Bathtubs required to be accessible shall comply with this section.

1. **Floor space.** There shall be a minimum clear floor space 48 inches parallel by 30 inches perpendicular (1219 mm by 762 mm) to the side of a bathtub or bathtub-shower combination to provide for the maneuvering of a wheelchair and transfer to and from the bathing facilities. The controls shall be on the wall at the foot of the bathtub. The edge of the clear floor space shall be flush with the control wall surface. The

area under a lavatory, located at the control end of the tub, may be included in the clear floor space provided the lavatory is 19 inches (483 mm) maximum deep, and the knee and toe space comply with Section 1134A.8. Cabinets under lavatories and toilets shall not encroach into the clear floor space.

2. **Reinforced walls for grab bars.** A bathtub installed without surrounding walls shall provide reinforced areas for the installation of floor-mounted grab bars.

Where a bathtub is installed with surrounding walls, grab bar reinforcement shall be located on each end of the bathtub, 32 inches to 38 inches (813 mm to 965 mm) above the floor, extending a minimum of 24 inches (610 mm) from the front edge of the bathtub toward the back wall of the bathtub. The grab bar reinforcement shall be a minimum of 6 inches (152.4 mm) nominal in height. (See Figure 11A-9G.)

Grab bar reinforcement shall be installed on the back wall of the bathtub a maximum of 6 inches (152.4 mm) above the bathtub rim extending upward to at least 38 inches (965 mm) above the floor. Grab bar backing shall be installed horizontally to permit the installation of a 48-inch (1219 mm) grab bar with each end a maximum of 6 inches (152.4 mm) from the end walls of the bathtub. The grab bar reinforcement shall be a minimum of 6 inches (152.4 mm) nominal in height.

3. **Bathtub controls.** Faucet controls and operation mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist.

The force required to activate controls shall be no greater than 5 pounds (22.2 N). Lever operated, push type and electronically controlled mechanisms are examples of acceptable designs.

4. **Shower unit.** A shower spray unit is not required in bathtubs.

5. **Bathtub enclosures.** Doors and panels of bathtub enclosures shall be substantially constructed from approved, shatter-resistant materials. Hinged doors shall open outward. Glazing used in doors and panels of bathtub enclosures shall be fully tempered, laminated safety glass or approved plastic. When glass is used, it shall have minimum thickness of not less than 1/8 inch (3.17 mm) when fully tempered, or 1/4 inch (6.35 mm) when laminated, and shall pass the test requirements of this part, Chapter 24, Glass and Glazing. Plastics used in doors and panels of bathtub enclosures shall be of a shatter-resistant type.

#### **1134A.6 Showers.** Showers required to be accessible shall comply with this section.

1. **Size.** When one or more shower stalls are provided within the same dwelling units, at least one shower stall shall comply with one of the following requirements.

1.1. The shower stall shall measure at least 42 inches wide by 48 inches deep (1067 mm by 1219 mm) with an entrance opening of at least 36 inches (914 mm); or

1.2. The shower stall shall measure at least 30 inches deep by 60 inches wide (762 mm by 1524 mm) with an entrance opening of at least 60 inches (1524 mm). A water closet may project a maximum of 12 inches (305 mm) into the opening, provided that a minimum of 36 inches (914 mm) clear space is maintained between the water closet and the shower wall as illustrated in Figure 11A-9L or;

1.3. Other shower stall configurations shall measure at least 36 inches deep by 60 inches wide (914 mm by 1524 mm) with an entrance opening of at least 36 inches (914 mm) when a wall is installed on the opening side.

2. **Slope.** The maximum slope of the shower floor shall be 1/2 inch (12.7 mm) per foot in any direction and shall slope to a drain. The floor surfaces shall be of Carborundum or grit-faced tile or of material providing equivalent slip resistance.

3. **Floor space.** A clear maneuvering space at least 30 inches in width by 48 inches in length (762 mm by 1219 mm) shall be located outside the shower, flush and parallel to the control wall.

4. **Reinforced walls for grab bars.** Grab bar reinforcement shall be installed continuous in the walls of showers 32 inches to 38 inches (813 mm to 965 mm) above the floor. The grab bar reinforcement shall be a minimum of 6 inches (152.4 mm) nominal in height.

Glass-walled shower stalls shall provide reinforcement for installation of floor-mounted or ceiling-mounted grab bars.

5. **Thresholds.** When a threshold is used, it shall be a maximum of 2 inches (50.8 mm) in height and have a beveled or sloped angle not exceeding 1 unit vertical in 2 units horizontal (26.6 degrees from the horizontal). Thresholds 1/2 inch (12.7 mm) or less in height may have a beveled or sloped angle not exceeding 1 unit vertical in 1 unit horizontal (45 degrees from the horizontal).

6. **Shower controls.** Faucet controls and operation mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 pounds (22.2N). Lever operated, push-type and electronically controlled mechanisms are examples of acceptable designs.

7. **Shower enclosures.** Doors and panels of shower enclosures shall be substantially constructed from approved, shatter-resistant materials. Hinged shower doors shall

open outward. Glazing used in doors and panels of shower enclosures shall be fully tempered, laminated safety glass or approved plastic. When glass is used, it shall have minimum thickness of not less than  $\frac{1}{8}$  inch (3.17 mm) when fully tempered, or  $\frac{1}{4}$  inch (6.35 mm) when laminated, and shall pass the test requirements of this part, Chapter 24, Glass and Glazing. Plastics used in doors and panels of shower enclosures shall be of a shatter-resistant type.

**1134A.7 Water closets.** Water closets in bathrooms or powder rooms required to be accessible shall comply with this section.

1. **Floor space and location.** The minimum floor space provided at a water closet shall be 48 inches (1219 mm) in clear width. The clear floor space shall extend past the front edge of the water closet at least 36 inches (914 mm). See Figure 11A-9M.

**Exception:** The 48-inch (1219 mm) minimum clear width may be reduced to 36 inches (914 mm) for lavatories, cabinets, wing walls or privacy walls located immediately adjacent to a water closet which extend no more than 24 inches (610 mm) in depth.

Water closets shall be located within bathrooms in a manner that permits a grab bar to be installed on at least one side of the fixture. The centerline of the water closet shall be 17 inches (432 mm) minimum to 18 inches (457 mm) maximum from a grab bar wall or partition. In locations where water closets are adjacent to non-grab bar walls, vanities, lavatories or bathtubs, the centerline of the fixture shall be a minimum of 18 inches (457 mm) from the obstacle.

2. **Reinforced walls for grab bars.** Where the water closet is not placed adjacent to a side wall capable of accommodating a grab bar, the bathroom shall have provisions for installation of floor-mounted, foldaway or similar alternative grab bars.

Where the water closet is placed adjacent to a side wall, reinforcement shall be installed on both sides or one side and the back. If reinforcement is installed at the back, it shall be installed between 32 inches (813 mm) and 38 inches (965 mm) above the floor. The grab bar reinforcement shall be a minimum of 6 inches (152.4 mm) nominal in height. The backing shall be a minimum of 40 inches (1016 mm) in length.

Reinforcement installed at the side of the water closet shall be installed 32 inches to 38 inches (813 mm to 965 mm) above the floor. The reinforcement shall be installed a maximum of 12 inches (305 mm) from the rear wall and shall extend a minimum of 26 inches (660 mm) in front of the water closet. The grab bar reinforcement shall be a minimum of 6 inches (152.4 mm) nominal in height.

3. **Seat height.** The minimum height of water closet seats shall be 15 inches (381 mm) above the floor.

4. **Water closet controls.** Water closet controls shall be mounted no more than 44 inches (1118 mm) above the floor. The force required to activate controls shall be no greater than 5 pounds (22.2 N).

**1134A.8 Lavatories, vanities, mirrors and towel fixtures.** Bathrooms or powder rooms required to be accessible shall have at least one accessible lavatory. Where mirrors and towel fixtures are provided, at least one of each shall be accessible.

1. **Location.** Vanities and lavatories shall be installed with the centerline of the fixture a minimum of 18 inches (457 mm) horizontally from an adjoining wall or fixture to allow for forward approach. When parallel approach is provided, lavatories shall be installed with the centerline of the fixture a minimum of 24 inches (610 mm) horizontally from an adjoining wall or fixture. The top of the fixture rim shall be a maximum of 34 inches (864 mm) above the finished floor.
2. **Floor space.** A clear maneuvering space at least 30 inches by 48 inches (762 mm by 1219 mm) shall be provided at lavatories and shall be centered on the lavatory.
3. **Cabinets.** Cabinets under lavatories are acceptable provided the bathroom has space to allow a parallel approach by a person in a wheelchair and the lavatory cabinets are designed with adaptable knee and toe space.
4. **Knee and toe space.** Knee and toe space shall be provided by one of the following:
  - 4.1. The space beneath the lavatory shall be left clear and unobstructed;
  - 4.2. Any cabinet beneath the lavatory shall be removable without the use of specialized knowledge or specialized tools; or
  - 4.3. Doors to the cabinet beneath the lavatory shall be removable or openable to provide the required unobstructed knee and toe space.

The knee and toe space shall be centered on the fixture, and shall comply with Section 1138A.2. The clear floor space required by Item 2 shall not extend into the knee and toe space more than 19 inches (483 mm). (See Figure 11A-9D.)
5. **Finished floor.** The finished floor beneath the lavatory shall be extended to the wall.
6. **Plumbing protection.** Water supply and drain pipes under lavatories shall be insulated or otherwise covered to protect against contact. There shall be no sharp or abrasive surfaces under lavatories.
7. **Lavatory faucet controls.** Faucet controls and operation mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist.

*The force required to activate controls shall be no greater than 5 pounds (22.2 N). Lever operated, push-type and electronically controlled mechanisms are examples of acceptable designs. Self-closing valves are allowed if the faucet remains open for at least 10 seconds.*

8. *Mirrors and towel fixtures. Where mirrors or towel fixtures are provided they shall be mounted with the bottom edge no higher than 40 inches (1016 mm) from the floor.*

## SECTION 1135A LAUNDRY ROOMS

**1135A.1 General.** If clothes washing machines and clothes dryers are provided in covered multifamily dwelling units, one of each type of appliance shall be provided. Where front-loading clothes washers are not provided, management shall provide assistive devices, on request of the occupant, to permit the use of top-loading clothes washers.

## SECTION 1136A ELECTRICAL RECEPTACLE, SWITCH AND CONTROL HEIGHTS

**1136A.1 Receptacle heights.** Electrical receptacle outlets on branch circuits of 30 amperes or less and communication system receptacles shall be located no more than 48 inches (1219 mm) measured from the top of the receptacle outlet box nor less than 15 inches (381 mm) measured from the bottom of the receptacle outlet box to the level of the finished floor or working platform. If the reach is over a physical barrier or an obstruction (for example, a kitchen base cabinet), receptacles shall be located within the reach ranges specified in Section 1138A.3. Physical barriers and obstructions shall not extend more than 25 inches (635 mm) from the wall beneath the receptacle.

Receptacle outlets that do not satisfy these specifications are acceptable provided that comparable receptacle outlets,

that perform the same functions, are provided within the same area and are accessible.

### Exceptions:

1. Receptacle outlets installed as part of permanently installed baseboard heaters are exempt.
2. Required receptacle outlets shall be permitted in floors when adjacent to sliding panels or walls.
3. Baseboard electrical outlets used in relocatable partitions, window walls or other electrical convenience floor outlets are not subject to the minimum height requirements.
4. This section shall not apply to existing buildings when the enforcing agency determines that compliance with these standards would create an unreasonable hardship.

**1136A.2 Switch and control heights.** Controls or switches intended to be used by the occupant of the room or area to control lighting and receptacle outlets, appliances, alarms or cooling, heating and ventilating equipment shall be located no more than 48 inches (1219 mm) measured from the top of the outlet box nor less than 15 inches (381 mm) measured from the bottom of the outlet box to the level of the finished floor or working platform. If the reach is over a physical barrier or an obstruction (for example, a kitchen base cabinet) switches and controls shall be located within the reach ranges specified in Section 1138A.3. Physical barriers or obstructions shall not extend more than 25 inches (635 mm) from the wall beneath a control.

Switches and controls that do not satisfy these specifications are acceptable provided that comparable controls or outlets, that perform the same functions, are provided within the same area and are accessible.

**Exception:** Appliances (e.g., kitchen stoves, dishwashers, range hoods, microwave ovens and similar appliances) which have controls located on the appliance.

## Division V – FEATURES COMMON TO EXTERIOR AND INTERIOR OF BUILDINGS

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## SECTION 1137A OTHER FEATURES AND FACILITIES

**1137A.1 General.** This division shall apply to features and facilities of common use areas on accessible floors or sites.

**Note:** The provisions in this division are not applicable to dwelling units, unless otherwise specified.

## SECTION 1138A SPACE ALLOWANCES AND REACH RANGES

### 1138A.1 Space allowances.

**1138A.1.1 Single wheelchair passage width.** The minimum clear width for single wheelchair passage shall be 36 inches (914 mm) continuously. (See Figure 11A-1E.)

See Section 1113A for minimum clear width of sidewalks, and Section 1120A for minimum clear width of interior accessible routes.

**Exception:** 32 inches (813 mm) in width is acceptable at a point not to exceed 24 inches (610 mm) in length. The segments with reduced width shall be separated by segments that are 48 inches (1219 mm) long minimum and 36 inches (914 mm) wide minimum.

**1138A.1.2 Width for two wheelchairs passing.** The minimum width for two wheelchairs to pass is 60 inches (1524 mm) (See Figure 11A-1E).

An accessible route (exterior and interior) with a clear width less than 60 inches (1524 mm) shall provide passing spaces at intervals of 200 feet (60 960 mm) maximum. Passing spaces shall be either: a space 60 inches (1524 mm) minimum by 60 inches (1524 mm) minimum; or, an intersection of two walking surfaces providing a T-shaped space complying with Section 1138A.1.3.1, where the base and arms of the T-shaped space extend 48 inches (1219 mm) minimum beyond the intersection. (See Figure 11A-1L.)

**1138A.1.3 Wheelchair turning space.** The space required for a wheelchair to make a 180-degree turn shall be a circular clear space of 60 inches (1524 mm) diameter minimum (See Figure 11A-1D(a)); or a T-shaped space complying with Section 1138A.1.3.1. The circular turning

space shall be permitted to include knee and toe clearance complying with Section 1138A.2

If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as required in Section 1138A.1.5.

**1138A.1.3.1 T-shaped turning space.** A T-shaped turning space shall be within a 60 inch (1524 mm) square minimum with arms and base 36 inches (914 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction, and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with Section 1138A.2 only at the end of either the base or one arm. (See Figure 11A-1D (b).)

**1138A.1.3.2 Surfaces of turning spaces.** Turning spaces for wheelchairs shall be stable, firm, slip resistant, and shall comply with Section 1110A.3 or Section 1119A.2. Changes in level are not permitted. Slopes not steeper than 1:48 shall be permitted

### 1138A.1.4 Clear floor or ground space for wheelchairs.

**1138A.1.4.1 Size and approach.** The minimum clear floor or ground space shall be 30 inches by 48 inches (762 mm by 1219 mm). The minimum clear floor or ground space may be positioned for forward or parallel approach to an object (See Figure 11A-1G). Clear floor or ground space may be part of the knee and toe space required under some objects unless otherwise specified.

**1138A.1.4.2 Relationship of maneuvering clearances to wheelchair spaces.** One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin an accessible route or adjoin another wheelchair clear floor space.

If a clear floor space is located in an alcove or otherwise confined on all or a part of three sides, additional maneuvering clearances shall be provided in accordance with the following: (See Figure 11A-1H).

- 1. Forward approach.** Alcoves shall be 36 inches (914 mm) wide minimum when the depth exceeds 24 inches (610 mm).
- 2. Parallel approach.** Alcoves shall be 60 inches (1524 mm) wide minimum when the depth exceeds 15 inches (381 mm)

**1138A.1.4.3 Surfaces of wheelchair spaces.** Clear floor or ground spaces for wheelchairs shall be stable, firm, slip resistant, and shall comply with Section 1110A.3 or Section 1119A.2. Changes in level are not permitted. Slopes not steeper than 1:48 shall be permitted.

**1138A.1.4.3.1 Gratings.** Gratings located in ground and floor surfaces along accessible routes shall be limited to spaces no greater than  $\frac{1}{2}$ -inch (12.7mm) wide in one direction. If gratings have elongated openings, they shall be placed so that the long

dimension is perpendicular to the dominant direction of traffic.

**1138A.1.5 Turn around obstruction.** When the accessible route makes a 180 degree turn around an element which is less than 48 inches (1219 mm) wide, clear width shall be 42 inches (1067 mm) minimum approaching the turn, 48 inches (1219 mm) minimum at the turn and 42 inches (1067 mm) minimum leaving the turn. When the clear width at the turn is 60 inches (1524 mm) minimum, the clear width when approaching and when leaving the turn shall be 36 inches (914 mm) minimum. (See Figure 11A-1C (b).)

When the accessible route makes a 90 degree turn around an element which is more than 48 inches (1219 mm) wide, clear width shall be 36 inches (914 mm) minimum approaching the turn, at the turn and leaving the turn. (See Figure 11A-1C (a).)

**1138A.2 Knee and toe space.** When space beneath an accessible element is included as part of a clear floor space, or turning space, the space shall comply with this section. Additional space shall not be prohibited beneath an element but shall not be considered as part of the clear floor space or turning space. (See Figure 11A-9D.)

**1138A.2.1 Knee space.** Space under an element between 9 inches (229 mm) and 27 inches (686 mm) above the finish floor shall be considered knee space. The knee space shall be clear and unobstructed.

#### Exceptions:

1. For lavatories required to be accessible, the knee space shall be at least 29 inches (737 mm) high at the front face and reducing to not less than 27 inches (686 mm) at a point 8 inches (203.2 mm) back from the front edge.
2. For lavatories and sinks required to be accessible, the dip of the overflow shall not be considered in determining knee and toe clearances.

**1138A.2.1.1 Minimum width.** Knee space shall be 30 inches (762 mm) wide minimum.

**1138A.2.1.2 Maximum depth.** Knee space shall extend 25 inches (635 mm) maximum under an element at 9 inches (229 mm) above the finish floor.

**1138A.2.1.3 Minimum depth.** When knee space is required under an element as part of a clear floor space, the knee space shall be 11 inches (279 mm) deep minimum at 9 inches (229 mm) above the finish floor, and 8 inches (203 mm) deep minimum at 27 inches (686 mm) above the finish floor, measured from the front edge of the element.

#### Exceptions:

1. Combined knee and toe space shall extend 19 inches (483 mm) minimum under sinks required to be accessible.
2. Combined knee and toe space shall extend 19 inches (483 mm) minimum under built-in dining and work surfaces required to be accessible.

**1138A.2.1.4 Clearance reduction.** Between 9 inches (229 mm) and 27 inches (686 mm) above the finish floor, the knee space shall be permitted to be reduced at a rate of 1 inch (25 mm) in depth for each 6 inches (152 mm) in height.

**1138A.2.2 Toe space.** Space under an element between the finish floor and 9 inches (229 mm) above the finish floor shall be considered toe space.

**1138A.2.2.1 Minimum width.** Toe space shall be 30 inches (762 mm) wide minimum.

**1138A.2.2.2 Maximum depth.** Toe space shall extend 25 inches (635 mm) maximum under an element.

**1138A.2.2.3 Minimum depth.** When toe space is required under an element as part of a clear floor space, the toe space shall extend 17 inches (432 mm) minimum under the element, measured from the front edge of the element.

#### Exceptions:

1. Combined knee and toe space shall extend 19 inches (483 mm) minimum under sinks required to be accessible.
2. Combined knee and toe space shall extend 19 inches (483 mm) minimum under build-in dining and work surfaces required to be accessible.

**1138A.2.2.4 Additional clearance.** Space extending greater than 6 inches (152 mm) beyond the available knee space at 9 inches (229 mm) above the finish floor shall not be considered toe space.

### 1138A.3 Reach ranges.

#### 1138A.3.1 Forward reach.

**1. Unobstructed.** When the clear floor space allows only forward approach to an object, the maximum high forward reach allowed shall be 48 inches (1219 mm) and the minimum low forward reach shall be no less than 15 inches (381 mm) above the finish floor. (See Figure 11A-II(a).)

**2. Obstructed high reach.** When the high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the reach depth over the obstruction.

The high forward reach shall be 48 inches (1219 mm) maximum when the reach depth is 20 inches (508 mm) maximum. When the reach depth exceeds 20 inches (508 mm), but is not more than 25 inches (635 mm), the high forward reach shall be 44 inches (1118 mm) maximum. (See Figure 11A-II(b).)

#### 1138A.3.2 Side reach.

**1. Unobstructed.** When a clear floor space allows a parallel approach to an element, and the side reach is unobstructed, the high side reach shall be 48 inches (1219 mm) maximum, and the low side reach shall be 15 inches (381 mm) minimum

above the finish floor. (See Figures 11A-1J(a) and 11A-1J(b).)

**Exceptions:**

1. An obstruction shall be permitted between the clear floor space and the element when the depth of the obstruction is 10 inches (254 mm) maximum.
2. Bookshelves shall be permitted to be 54 inches (1372 mm) maximum above the finish floor. Bookshelves may be greater than 54 inches (1372 mm) above the finish floor when an attendant is available to assist persons with disabilities.
2. **Obstructed high reach.** When a clear floor space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (864 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum.

The high side reach shall be 48 inches (1219 mm) maximum for a reach depth of 10 inches (254 mm) maximum. When the reach depth exceeds 10 inches (254 mm), but no more than 24 inches (610 mm), the high side reach shall be 46 inches (1168 mm) maximum. (See Figure 11A-1J(c).)

**Exception:** Kitchen countertops in dwelling units, and the top of washing machines and clothes dryers shall be permitted to be 36 inches (914 mm) maximum above the finish floor.

**1138A.4 Controls and operating mechanisms.**

**Note:** See also Section 1142A for receptacle, switch and control installation.

**1138A.4.1 General.** Controls and operating mechanisms in accessible spaces, along accessible routes or as part of accessible elements shall comply with this section.

**1138A.4.2 Clear floor space.** Clear floor space complying with Section 1138A.1.4 that allows a forward or parallel approach by a person using a wheelchair shall be provided at all controls and operating mechanisms.

**1138A.4.3 Height.** Controls and operating mechanisms shall be located no higher than 48 inches (1219 mm), and no lower than 15 inches (381 mm), above the finished floor measured to the center of the grip. If the reach is over an obstruction (for example, washer or dryer), controls and operating mechanisms shall be located within the reach ranges specified in Section 1138A.3. Controls and operating mechanisms that do not satisfy these specifications are acceptable, provided that comparable mechanisms, controls or outlets, that perform the same functions, are provided within the same area and are accessible.

**1138A.4.4 Operation.** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls and operating mechanisms shall be no greater than 5 pounds (22.2 N).

## **SECTION 1139A ACCESSIBLE DRINKING FOUNTAINS**

**1139A.1 General.** Drinking fountains and water coolers in common use areas and/or sites shall comply with this section. A side approach drinking fountain is not acceptable. (See Figure 11A-11A.)

**1139A.2 Accessible route.** Drinking fountains and water coolers shall be on an accessible route.

**1139A.3 Depth.** Drinking fountains shall be a minimum of 18 inches (457 mm) and a maximum of 19 inches (483 mm) in depth.

**1139A.4 Clear floor space.** Drinking fountains shall be provided with 30 inches by 48 inches (762 mm by 1219 mm) clear floor space, centered on the unit. The clear floor space shall be positioned for a forward approach.

**1139A.4.1 Knee and toe space.** Drinking fountains shall be provided with a clear and unobstructed knee and toe space. Knee and toe space shall comply with Section 1138A.2.

**1139A.5 Spout location.** The spout shall be located 15 inches (381 mm) minimum from the vertical support and 5 inches (127 mm) maximum from the front edge of the drinking fountain, including bumpers. Spout outlets shall be 36 inches (914 mm) maximum above the finish floor.

**1139A.6 Water flow.** The spout shall provide a flow of water at least 4 inches (101.6 mm) high to allow the insertion of a cup or glass under the flow of water. The angle of the water stream shall be measured horizontally relative to the front face of the unit. When spouts are located less than 3 inches (76 mm) from the front of the unit, the angle of the water stream shall be 30 degrees maximum. When spouts are located between 3 inches (76 mm) and 5 inches (127 mm) maximum from the front of the unit, the angle of the water stream shall be 15 degrees maximum.

**1139A.7 Controls and operating mechanisms.** The flow of water shall be activated by manually or electronically operated controls. The manually operated controls shall be front mounted or side mounted, located within 6 inches (152 mm) of the front edge of the fountain. The force required to activate controls shall be no greater than 5 pounds (22.2 N).

**1139A.8 Location.** Drinking fountains shall be located completely within alcoves, between wing walls or otherwise positioned so as not to encroach into pedestrian ways. The alcove or otherwise protected area in which the drinking fountain is located shall not be less than 32 inches (813 mm) in width and 18 inches (457 mm) in depth. When the depth of the protected area where the drinking fountain is located exceeds 24 inches (610 mm), additional maneuvering clearance shall be provided in accordance with Section 1138A.1.4.2 and Figure 11A-1H.

When provided, wing walls shall project out from the supporting wall at least as far as the drinking fountain to within 6 inches (152.4 mm) vertically from the finish floor.

Protruding objects located in alcoves or otherwise positioned so as to limit encroachment into pedestrian ways are permitted to project 4 inches (101.6 mm) into walks, halls, corridors, passageways or aisles. (See Figure 11A-11A.)

## SECTION 1140A ACCESSIBLE TELEPHONES

**1140A.1 General.** When public telephones are provided, they shall comply with this section. On floors where public telephones are provided, at least one telephone shall be accessible. On any floor where two or more banks of multiple telephones are provided, at least one telephone in each bank shall be accessible.

**1140A.2 Clear floor or ground space.** A clear floor or ground space at least 30 inches by 48 inches (762 mm by 1219 mm) that allows either a forward or parallel approach by a person using a wheelchair shall be provided at telephones. The clear floor or ground space shall comply with Section 1138A.1.4. Bases, enclosures and fixed seats shall not impede approaches to telephones by people who use wheelchairs. (See Figure 11A-11B.)

> Clear floor or ground space for wheelchairs may be part of the knee space required under some objects.

**1140A.3 Relationship of maneuvering clearances to wheelchair spaces.** One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise, confined on all or part of three sides, additional maneuvering clearances shall be provided. (See Section 1138A.1.4.)

**1140A.4 Mounting height.** The highest operable part of the telephone shall be within the reach ranges specified in Section 1138A.3 (See Figure 11A-11B.)

**1140A.5 Enclosures.** If telephone enclosures are provided, they shall comply with Sections 1140A.5.1 and 1140A.5.2. (See Figure 11A-11B.)

**1140A.5.1 Parallel approach.** Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of the telephone unit shall be 10 inches (254 mm) maximum.

**1140A.5.2 Forward approach.** Where a forward approach is provided, the counter may extend beyond the face of the telephone 20 inches (508 mm) maximum into the required clear floor or ground space and the enclosure may extend beyond the face of the telephone 24 inches (610 mm) maximum. If an additional 6 inches (152 mm) in width of clear floor space is provided, creating a clear floor space of 36 inches by 48 inches (914 mm by 1219 mm), the enclosure may extend more than 24 inches (610 mm) beyond the face of the telephone.

**1140A.6 Equipment for hearing impaired people.** Telephones shall be equipped with a receiver that generates a magnetic field in the area of the receiver cap. A reasonable number of the public telephones provided, but always at least one on each floor or in each bank, whichever is more, in a building or facility, shall be equipped with a volume control. Such telephones shall be capable of providing a gain adjustable up to 20 dB minimum. For incremental volume control, at least one intermediate step of 12 dB of gain minimum shall be provided. An automatic reset shall also be provided. Public telephones with volume control shall be hearing aid compatible and shall be identified by a sign containing a depiction of a telephone handset with radiating sound waves. (See Figure 11A-11D.)

**1140A.7 Text telephones (TTY).** If a total of four or more public pay telephones are provided at the interior and exterior of a site, and if at least one of the total number provided is located in an interior location, at least one interior public text telephone shall be provided. TTYS provided at a public pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the TTY and the telephone receiver.

**1140A.7.1 Signage.** Text telephones shall be identified by the International TTY symbol (see Figure 11A-11C). If a facility has a public text telephone, directional signage indicating the location of the nearest such telephone shall be placed adjacent to all banks of telephones that do not contain a text telephone. Such directional signage shall include the International TTY symbol. If a facility has no banks of telephones, the directional signage shall be provided at the entrance or in a building directory.

**1140A.7.2 Height.** When in use, the touch surface of TTY keypads shall be 34 inches (864 mm) minimum above the finish floor.

**1140A.8 Controls.** Telephones shall have push-button controls where service for such equipment is available. Controls and operating mechanisms shall comply with Section 1138A.4.

**1140A.9 Cord length.** The cord from the telephone to the handset shall be at least 29 inches (737 mm) long.

**1140A.10 Telephone books.** If telephone books are provided, they shall be located in a position that complies with the reach ranges in Section 1138A.3.

**1140A.11 Shelf.** Public pay telephones required to accommodate a portable TTY shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a TTY and shall have 6 inches (152 mm) minimum vertical clearance above the area where the TTY is to be placed.

## SECTION 1141A ACCESSIBLE SWIMMING POOLS

**1141A.1 General.** Swimming pools in common use areas shall comply with the provisions of this section and Chapter 31B.

**1141A.2 Swimming pool deck areas.** Swimming pool deck areas must be accessible, and a mechanism to assist persons with disabilities gain entry into the pool and exit from the pool shall be provided. Such a mechanism may consist of a swimming pool lift device as long as the device meets all of the following criteria:

1. Has a seat that meets all of the following:
  - 1.1. The seat must be rigid;
  - 1.2. The seat must be not less than 17 inches (432 mm) and not more than 19 inches (483 mm), inclusive of any cushioned surface that might be provided, above the pool deck;
  - 1.3. The seat must have two armrests. The armrest on the side of the seat by which access is gained shall be either removable or fold clear of the seat;
  - 1.4. The seat must have a back support that is at least 12 inches (305 mm) tall; and

- 1.5. The seat must have an occupant restraint for use by the occupant of the seat and the restraint must meet the standards for operable controls in compliance with Section 1138A.4.4.
2. Be capable of unassisted operation from both the deck and water levels.
3. Be stable and not permit unintended movement when a person is getting into or out of the seat.
4. Be designed to have a live-load capacity of not less than 300 pounds.
5. Be positioned so that, if the pool has water of different depths, it will place the operator into water that is at least 3 feet (914 mm) deep.
6. Be capable of lowering the operator at least 18 inches (457 mm) below the surface of the water.

## SECTION 1142A ELECTRICAL RECEPTACLE, SWITCH AND CONTROL HEIGHTS

**1142A.1 Receptacle heights.** Electrical receptacle outlets on branch circuits of 30 amperes or less and communication system receptacles shall be located no more than 48 inches (1219 mm) measured from the top of the receptacle outlet box nor less than 15 inches (381 mm) measured from the bottom of the receptacle outlet box to the level of the finished floor or working platform. If the reach is over a physical barrier or an obstruction (for example, a kitchen base cabinet), receptacles shall be located within the reach ranges specified in Section 1138A.3. Physical barriers and obstructions shall not extend more than 25 inches (635 mm) from the wall beneath the receptacle.

Receptacle outlets that do not satisfy these specifications are acceptable provided that comparable receptacle outlets, that perform the same functions, are provided within the same area and are accessible.

### Exceptions:

1. Receptacle outlets installed as part of permanently installed baseboard heaters are exempt.
2. Required receptacle outlets shall be permitted in floors when adjacent to sliding panels or walls.
3. Baseboard electrical outlets used in relocatable partitions, window walls or other electrical convenience floor outlets are not subject to the minimum height requirements.
4. This section shall not apply to existing buildings when the enforcing agency determines that compliance with these standards would create an unreasonable hardship.

**1142A.2 Switch and control heights.** Controls or switches intended to be used by the occupant of the room or area to control lighting and receptacle outlets, appliances, alarms or cooling, heating and ventilating equipment shall be located no more than 48 inches (1219 mm) measured from the top of the outlet box nor less than 15 inches (381 mm) measured

from the bottom of the outlet box to the level of the finished floor or working platform. If the reach is over a physical barrier or an obstruction (for example, a kitchen base cabinet), switches and controls shall be located within the reach ranges specified in Section 1138A.3. Physical barriers or obstructions shall not extend more than 25 inches (635 mm) from the wall beneath a switch or control.

Switches and controls that do not satisfy these specifications are acceptable provided that comparable controls or outlets, that perform the same functions, are provided within the same area and are accessible.

## SECTION 1143A SIGNAGE

**1143A.1 General.** When signs and/or identification devices are provided they shall comply with this section.

When both visual and tactile characters are required, either one sign with both visual and tactile characters, or two separate signs - one with visual, and one with tactile characters, shall be provided.

**Exception:** Signs need not be provided within dwelling units.

**Note:** See Section 1127A.7 for additional signage requirements applicable to sanitary facilities, and Section 1124A for additional signage requirements applicable to elevators.

**1143A.2 Identification signs.** When signs identify permanent rooms and spaces of a building or site, they shall comply with Sections 1143A.1, 1143A.5, 1143A.6 and 1143A.7.

**Exception:** Exterior signs that are not located at the door to the space they serve shall not be required to comply with Section 1143A.6.

**1143A.3 Directional and informational signs.** When signs direct to or give information about permanent rooms and spaces of a building or site, they shall comply with Sections 1143A.5.

**1143A.4 Accessibility signs.** When signs identify, direct or give information about accessible elements and features of a building or site, they shall include the appropriate symbol of accessibility and shall comply with Section 1143A.5.

**1143A.5 Visual characters.** Signs with visual characters shall comply with this section.

**1. Finish and contrast.** Characters and their background shall have a non-glare finish. Characters shall contrast with their background, either light on a dark background or dark on a light background.

**2. Character type.** Characters shall be uppercase, lowercase or a combination of both. Characters shall be conventional in form, and shall not be italic, oblique, script, highly decorative, or of other unusual forms.

**3. Proportions.** Characters on signs shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

**TABLE 1143A.5**  
**VISUAL CHARACTER HEIGHT**

HEIGHT TO FINISH FLOOR FROM BASELINE OF CHARACTER	HORIZONTAL VIEWING DISTANCE	MINIMUM CHARACTER HEIGHT
40 inches (1016 mm) to less than or equal to 70 inches (1778 mm)	Less than 72 inches (1829 mm)	$\frac{5}{8}$ inch (15.9 mm)
	72 inches (1829 mm) and greater	$\frac{5}{8}$ inch (15.9 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (1829 mm)
Greater than 70 inches (1778 mm) to less than or equal to 120 inches (3048 mm)	Less than 180 inches (4572 mm)	2 inches (51 mm)
	180 inches (4572 mm) and greater	2 inches (51 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (4572 mm)
Greater than 120 inches (3048 mm)	Less than 21 feet (6401 mm)	3 inches (76 mm)
	21 feet (6401 mm) and greater	3 inches (76 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6401 mm)

4. **Character height.** Visual characters shall be sized in accordance with Table 1143A.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "I".

5. **Height from finish floor.** Visual characters shall be 40 inches (1016 mm) minimum above the finish floor.

**Exceptions:**

1. Visual characters indicating elevator car controls.
2. Floor-level exit signs complying with Chapter 10, Section 1011.6.

6. **Stroke thickness.** Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.

7. **Character spacing.** Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

8. **Line spacing.** Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

9. **Character format.** Text shall be in a horizontal format.

**1143A.6 Raised characters and pictorial symbol signs.** When raised characters are required or when pictorial symbols (pictograms) are used on such signs, they shall comply with this section. Raised characters and pictorial symbols shall be duplicated in Braille complying with Section 1143A.7.

1. **Character type.** Raised characters on signs shall be  $\frac{1}{32}$  inch (0.8 mm) minimum above their background. Characters shall be sans serif uppercase, and shall not be italic, oblique, script, highly decorative, or of other unusual forms.

2. **Character height.** Character height measured vertically from the baseline of the character shall be  $\frac{5}{8}$

inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I".

3. **Character format.** Characters and Braille shall be in a horizontal format.

4. **Proportions.** Raised characters on signs shall be selected from fonts when the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

5. **Stroke thickness.** Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.

6. **Character spacing.** Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. When characters have rectangular cross sections, spacing between individual raised characters shall be  $\frac{1}{8}$  inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. When characters have other cross sections, spacing between individual raised characters shall be  $\frac{1}{16}$  inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections, and  $\frac{1}{8}$  inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements  $\frac{3}{8}$  inch (9.5 mm) minimum.

7. **Line spacing.** Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

8. **Location.** When a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. When a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. When a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door. When there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located

on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (457 mm) minimum by 18 inches (457 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. When permanent identification signage is provided for rooms and spaces they shall be located on the approach side of the door as one enters the room or space. Signs that identify exits shall be located on the approach side of the door as one exits the room or space.

9. **Height.** Signs with raised characters shall be located 48 inches (1219 mm) minimum above the finish floor, measured from the baseline of the lowest Braille cells and 60 inches (1524 mm) maximum above the finish floor, measured from the baseline of the highest line of raised characters.

**Exception:** Tactile characters for elevator car controls shall not be required to comply with this section.

10. **Pictorial symbol signs (pictograms).** Pictorial symbol signs (pictograms) shall be accompanied by a text description located directly below the pictogram field. The text description shall comply with Sections 1143A.6 and 1143A.7. The outside dimension of the pictogram field shall be a minimum of 6 inches (152 mm) in height. Characters and Braille shall not be located in the pictogram field.

**1143A.7 Braille.** Contracted Grade 2 Braille shall be used wherever Braille is required in other portions of these standards.

**1143A.7.1 Dimensions and capitalization.** Braille dots shall have a domed or rounded shape and shall comply with Table 1143A.7.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

TABLE 1143A.7.1 BRAILLE DIMENSIONS

MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell <sup>1</sup>	0.100 (2.5 mm)
Distance between corresponding dots in adjacent cells <sup>1</sup>	0.300 (7.6 mm)
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between corresponding dots from one cell directly below <sup>1</sup>	0.395 (10 mm) to 0.400 (10.2 mm)

1. Measured center to center.

**1143A.7.2 Position.** Braille shall be positioned below the corresponding text in a horizontal format, flush left or centered. If text is multi-lined, braille shall be placed below the entire text. Braille shall be separated  $\frac{3}{8}$  inch (9.5 mm) minimum and  $\frac{1}{2}$  inch (12.7 mm) maximum from any other tactile characters and  $\frac{3}{8}$  inch (9.5 mm) minimum from raised borders and decorative elements.

**Exception:** Braille provided on elevator car controls shall be separated  $\frac{3}{16}$  inch (4.8 mm) minimum and shall be located directly below the corresponding raised characters or symbols.

**1143A.8 Symbols of accessibility.** Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background. Symbols of accessibility shall comply with the following:

- International Symbol of Accessibility.** The "International Symbol of Accessibility" shall consist of a white figure on a blue background. The color blue shall approximate FS 15090 in Federal Standard 595C. (See Figure 11A-1A.)
- International Symbol of TTY.** (See Figure 11A-11C.)
- Volume Control Telephones.** (See Figure 11A-11D.)
- Assistive Listening Systems.** (See Figure 11A-11E.)
- Cleaner Air Symbol.** (See Chapter 11B.)
- Toilet and Bathing Facilities Geometric Symbols.** (See Section 1127A.7.)

## SECTION 1144A Reserved

## SECTION 1145A Reserved

## SECTION 1146A Reserved

## SECTION 1147A Reserved

## SECTION 1148A Reserved

## SECTION 1149A Reserved

**Division VI – SITE IMPRACTICALITY TESTS****Division VI Table of Contents****Section 1150A Site Impracticality Tests****Test No. 1—Individual Building Test****Test No. 2—Site Analysis Test****Test No. 3—Unusual Characteristics Test**

**SECTION 1150A  
SITE IMPRACTICALITY TESTS**

**1150A.1 General.** Covered multifamily dwellings in buildings without an elevator, located on sites with difficult terrain conditions or unusual characteristics, may employ the site impracticality tests in this division for determining the accessibility and adaptability provisions required by this chapter.

Except as provided for in Section 1102A.3.1, the provisions of this section do not apply to multistory dwelling units in nonelevator buildings.

**SINGLE BUILDING WITH  
ONE COMMON (LOBBY) ENTRANCE**

The following may only be used for determining required access to covered multifamily dwelling units, in a single building with one common (lobby) entrance, located on a site with difficult terrain conditions or unusual characteristics:

All ground floor units in nonelevator buildings shall be adaptable and on an accessible route unless an accessible route to the common (lobby) entrance is not required as determined by Test No. 1, Individual Building Test, or Test No. 3, Unusual Characteristics Test, as described in this section.

Sites where either Test No. 1 or Test No. 3 is used and it is determined that an accessible route to the common (lobby) entrance is not required, at least 20 percent of the ground floor dwelling units shall comply with Division IV, and all remaining ground floor dwelling units shall comply with the features listed in Section 1150A.2 unless exempted by Test No. 3, Unusual Characteristics Test.

Test No. 1—Individual Building Test may only be used if the site has terrain over 15 percent slope.

Test No. 3—Unusual Characteristics Test may be used if applicable.

**Provisions to Test Nos. 1 and 2.** Where a building elevator is provided only as means of creating an accessible route to covered multifamily dwelling units on a ground floor, the building is not considered to be an elevator building for purposes of this code; hence, only the ground floor dwelling units would be covered.

**TEST NO. 1—INDIVIDUAL BUILDING TEST**

*It is not required by this code to provide an accessible route when the terrain of the site is such that both of the following apply:*

1. *The slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance exceed 15 percent; and*
2. *The slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance also exceed 15 percent.*

*If there are no vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance, the slope for the purposes of Test No. 1 will be measured to the closest vehicular or pedestrian arrival point.*

*For purposes of these requirements, vehicular or pedestrian arrival points include public or resident parking areas, public transportation stops, passenger loading zones and public streets or sidewalks. To determine site impracticality, the slope would be measured at ground level from the point of the planned entrance on a straight line to (1) each vehicular or pedestrian arrival point that is within 50 feet (15 240 mm) of the planned entrance, or (2) if there are no vehicular or pedestrian arrival points within the specified area, the vehicular or pedestrian arrival point closest to the planned entrance. In the case of sidewalks, the closest point to the entrance will be where a public sidewalk entering the site intersects with the walk to the entrance. In the case of resident parking areas, the closest point to the planned entrance will be measured from the entry point to the parking area that is located closest to the planned entrance.*

**TEST NO. 2—SITE ANALYSIS TEST**

*For a site having multiple buildings, or a site with a single building with multiple entrances, it is not required to provide an accessible route to all ground floor units under the following conditions:*

1. *Calculate the percentage of the total buildable area of the undisturbed site with a natural grade less than 10-percent slope. The analysis of the existing slope (before grading) shall be done on a topographic survey with 2-foot (610 mm) contour intervals with slope determination made between each successive interval. The accuracy of the slope analysis shall be certified by a licensed engineer, landscape architect, architect or surveyor.*
2. *Determine the requirement of providing an accessible route to planned multifamily dwellings based on the topography of the existing natural terrain. The minimum percentage of ground floor units required*

*on an accessible route shall equal the percentage of the total buildable area (not restricted-use areas) of the undisturbed site with an existing natural grade of less than 10-percent slope. In no case shall less than 20 percent of the ground floor dwelling units be on an accessible route and comply with the provisions of Division IV.*

3. *In addition to the percentage established in paragraph (2), all additional ground floor units in a building, or ground floor units served by a particular entrance, that fall within an 8.33-percent slope between their planned entrances and an arrival point shall be on an accessible route and comply with the provisions of Division IV.*
4. *All additional ground floor units in a building, or ground floor units served by a particular entrance, not on an accessible route shall comply with the features listed in Section 1150A.2.*

### TEST NO. 3—UNUSUAL CHARACTERISTICS TEST

*Unusual characteristics include sites located in a state or federally designated floodplain or coastal high-hazard areas and sites subject to other similar requirements of law or code that require the lowest floor or the lowest structural member of the lowest floor to be designed to a specified level at or above the base flood elevation. An accessible route to a building entrance is impractical due to unusual characteristics of the site when:*

1. *The original site characteristics result in a difference in finished grade elevation exceeding 30 inches (762 mm) and 10 percent measured between an entrance and all vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance; or*
2. *If there are no vehicular or pedestrian arrival points within 50 feet (15 240 mm) of the planned entrance, the unusual characteristics result in a difference in finished grade elevation exceeding 30 inches (762 mm) and 10 percent measured between an entrance and the closest vehicular or pedestrian arrival point.*

#### 1150A.2 Additional requirements for Section 1150A.

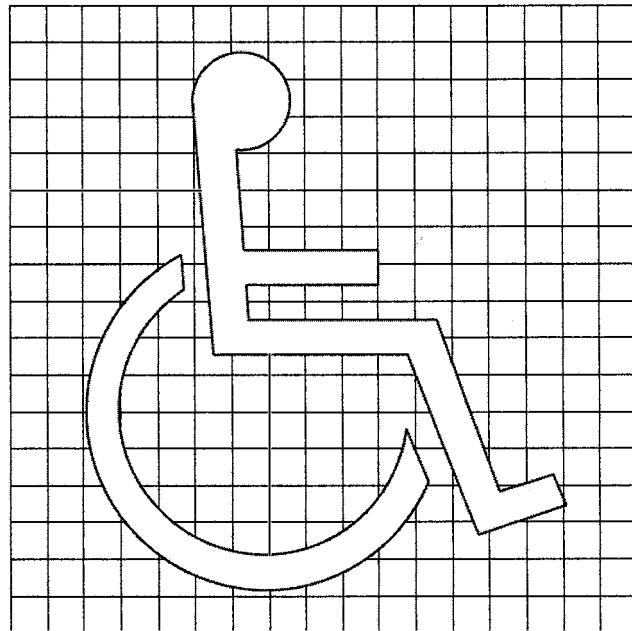
*All other ground floor dwelling units in nonelevator buildings shall be made to comply with the following requirements:*

1. *Grab bar reinforcement: see Section 1134A.*
2. *Thirty-two inch (813 mm) clear door interior opening width: see Section 1132A.3.*
3. *Lever hardware: see Section 1132A.8.*
4. *Door signal devices: see Section 1132A.10.*
5. *Clear space by doors: see Chapters 10 and 11A.*
6. *Minimum 15-inch (381 mm) water closet seat height: see Section 1134A.7, Item 3.*
7. *Electrical receptacle outlet height: see Section 1136A.*

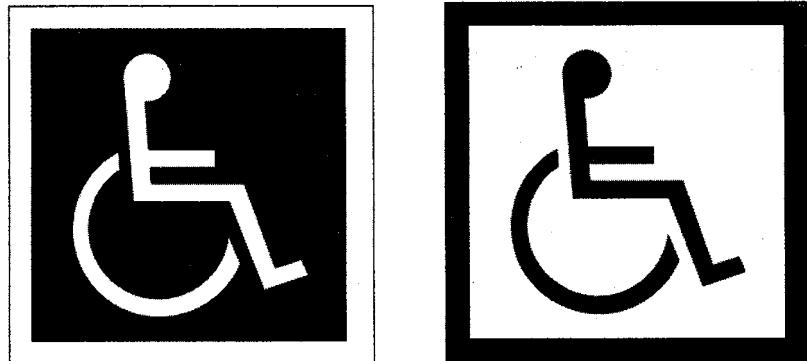
8. *Lighting and environmental control height: see Section 1136A.*
9. *Faucet controls: see Section 1134A.8, Item 7.*
10. *Water closet, bathtub and lavatory minimum space requirements: see Section 1134A.*
11. *Removable cabinets under the kitchen sink counter area: see Section 1133A.3.*

**Division VII – FIGURES**

*Diagrams illustrate the specific requirements of these regulations and are intended only as an aid for building design and construction. Diagrams are not to scale.*



(a) SYMBOL PROPORTIONS



(b) DISPLAY CONDITIONS

**FIGURE 11A-1A  
INTERNATIONAL ACCESSIBILITY SYMBOL**

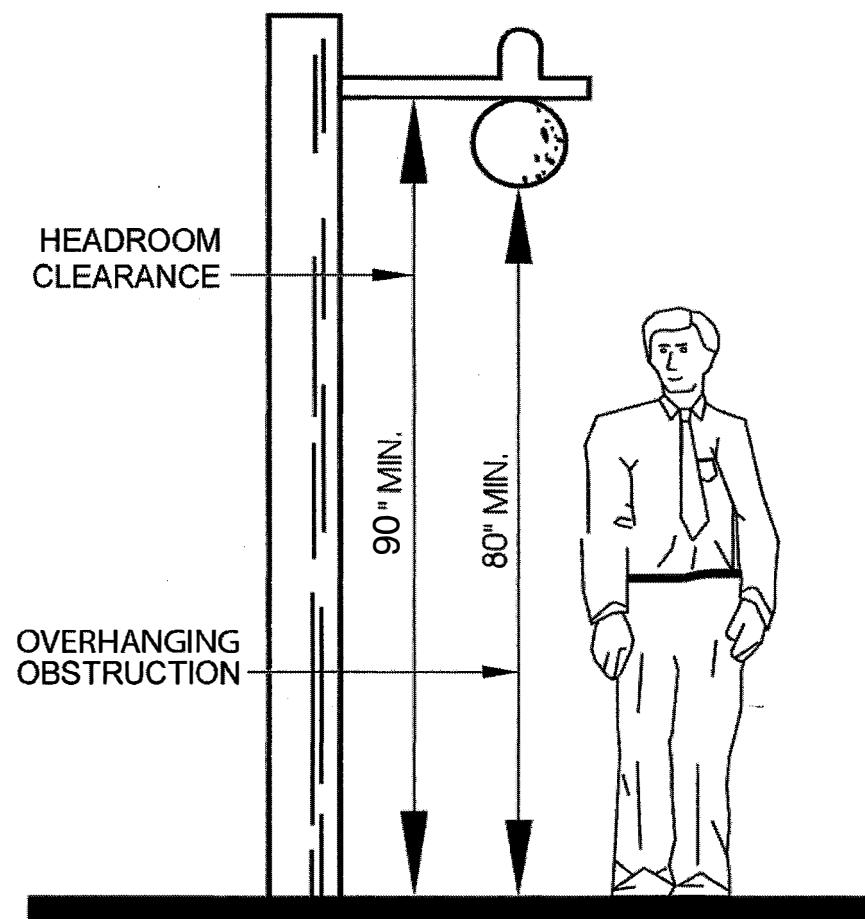
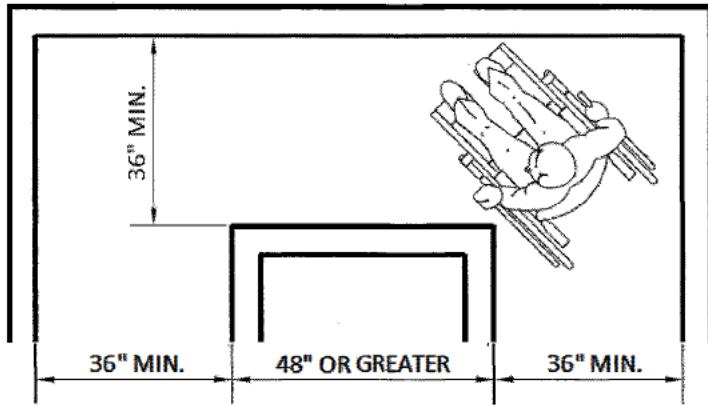
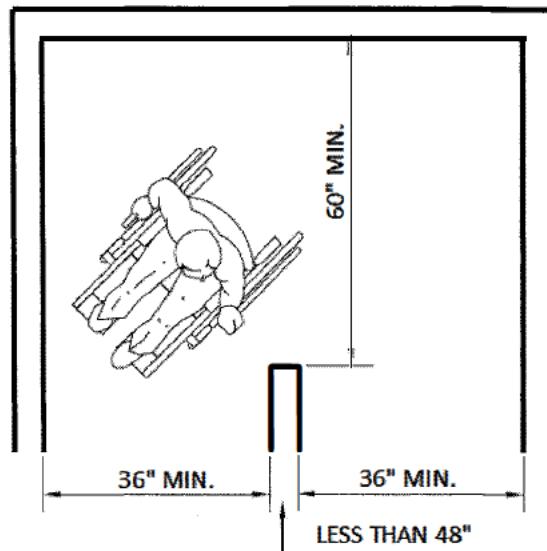
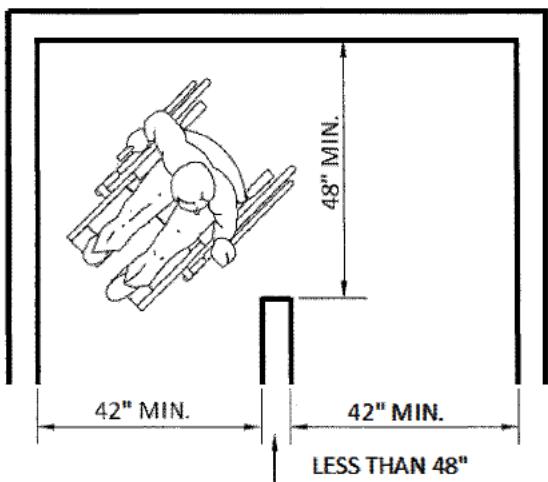


FIGURE 11A-1B  
HEADROOM CLEARANCE AND OVERHANGING OBSTRUCTION

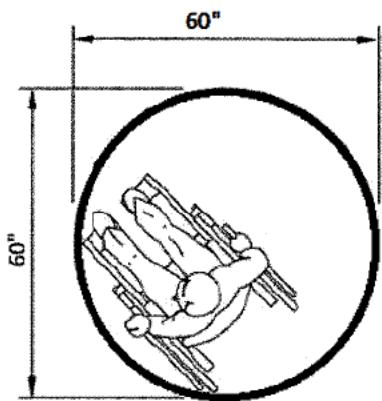


(a) 90° TURN AROUND OBSTRUCTION

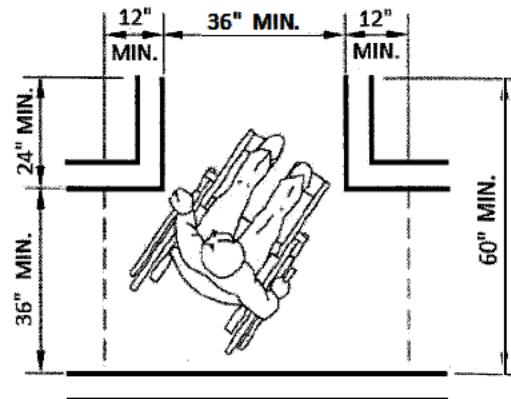


(b) 180° TURN AROUND OBSTRUCTION

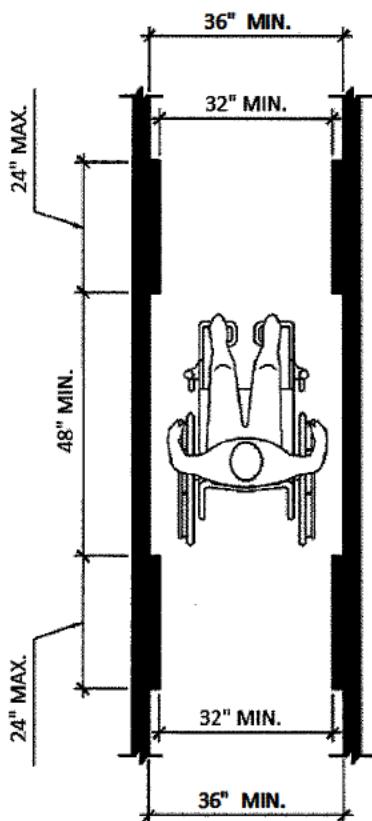
FIGURE 11A-1C  
WIDTH OF ACCESSIBLE ROUTE AT TURNS



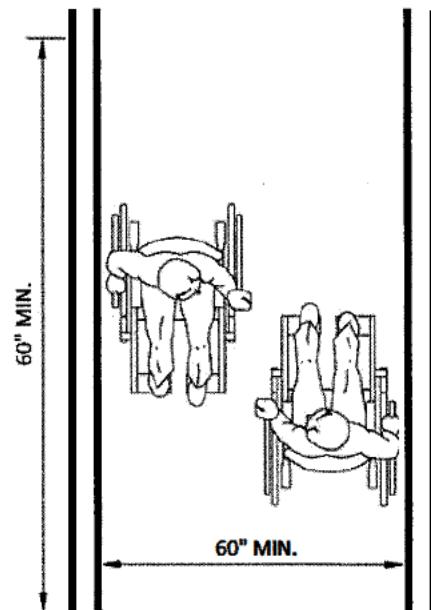
(a) 60 INCHES DIAMETER SPACE



(b) T-SHAPED SPACE FOR 180° TURN

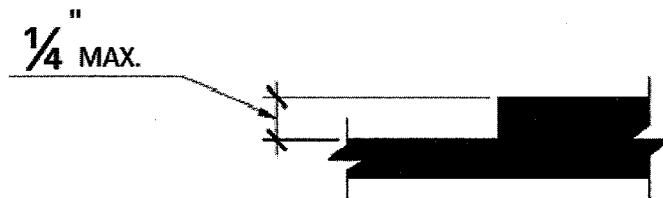
FIGURE 11A-1D  
WHEELCHAIR TURNING SPACE

MINIMUM CLEAR WIDTH FOR SINGLE WHEELCHAIR

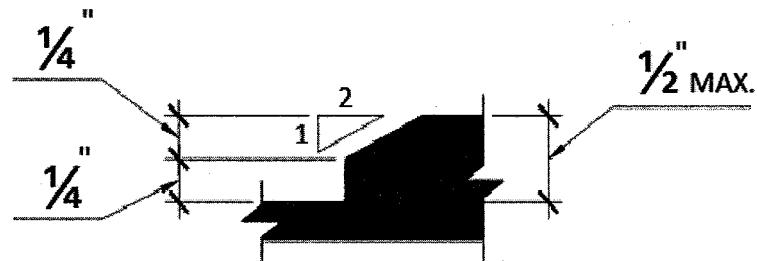


MINIMUM CLEAR WIDTH FOR TWO WHEELCHAIRS

FIGURE 11A-1E  
WHEELCHAIR PASSAGE WIDTH

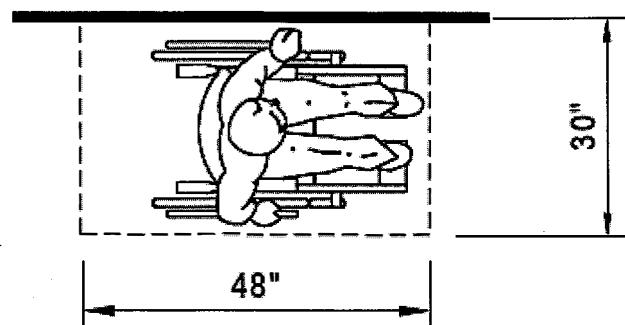


(a) VERTICAL CHANGE IN LEVEL

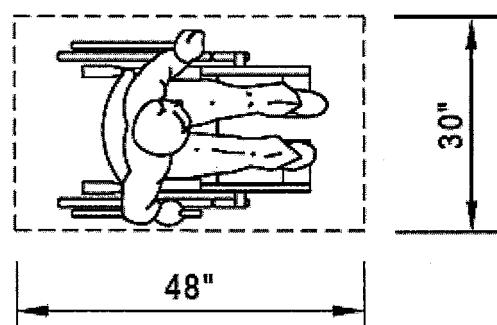


(b) BEVELED CHANGE IN LEVEL

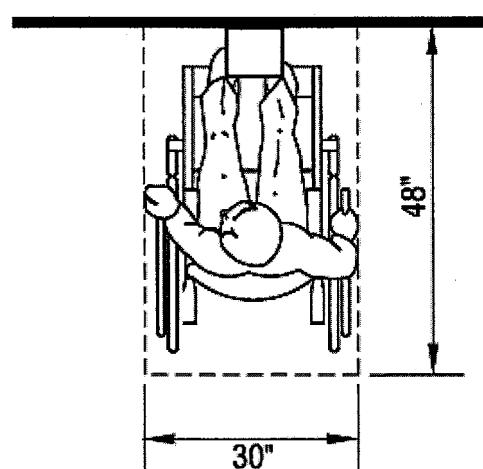
FIGURE 11A-1F  
CHANGE IN LEVEL



(a) PARALLEL APPROACH

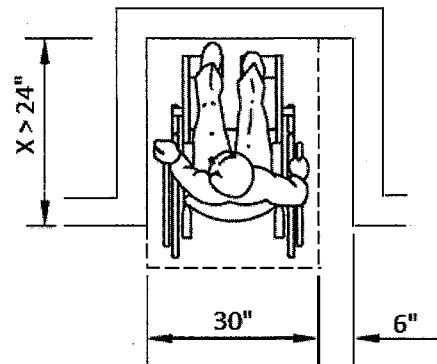
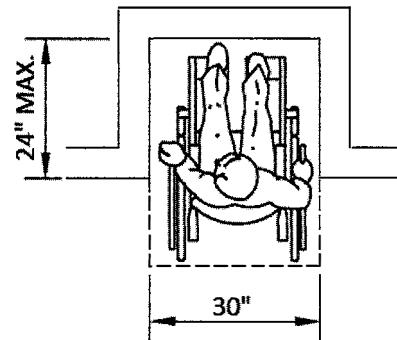


(b) CLEAR FLOOR SPACE



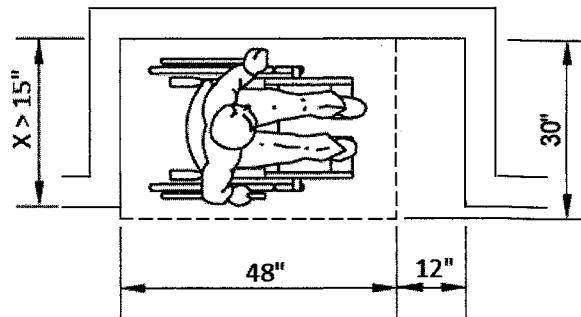
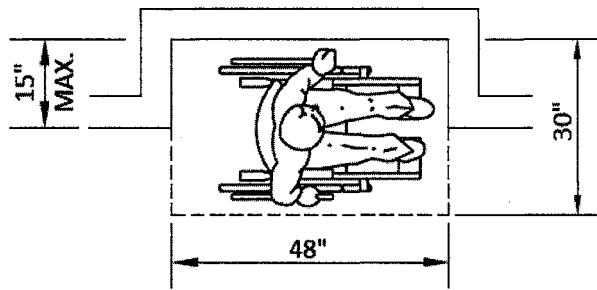
(c) FORWARD APPROACH

FIGURE 11A-1G  
MINIMUM CLEAR FLOOR SPACE FOR WHEELCHAIRS



IF  $X > 24"$ , ADDITIONAL MANEUVERING CLEARANCE OF 6" SHALL BE PROVIDED.

**(a) FORWARD APPROACH**



IF  $X > 15"$ , ADDITIONAL MANEUVERING CLEARANCE OF 12" SHALL BE PROVIDED.

**(b) PARALLEL APPROACH**

**FIGURE 11A-1H  
MINIMUM CLEAR FLOOR SPACE IN ALCOVES**

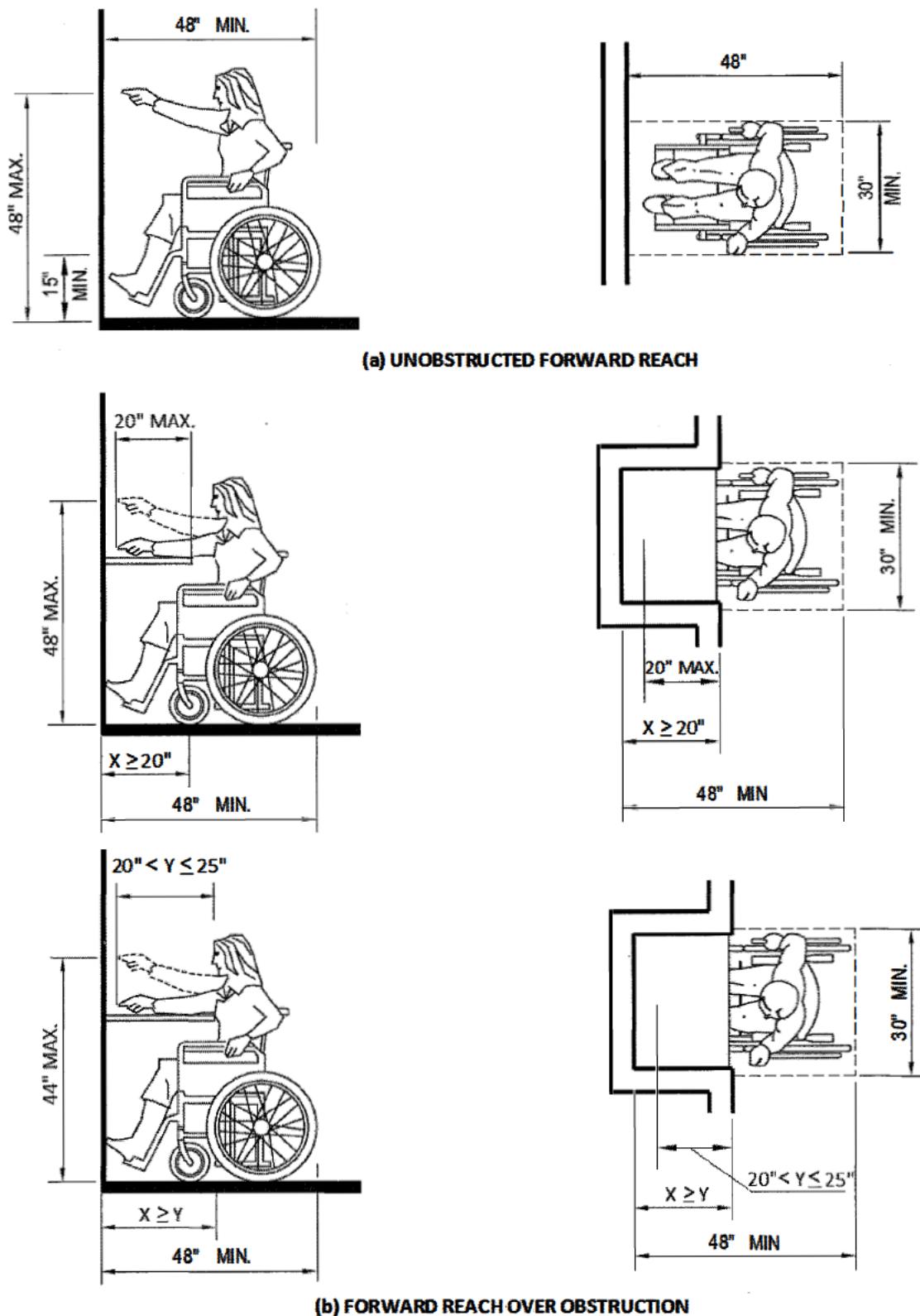
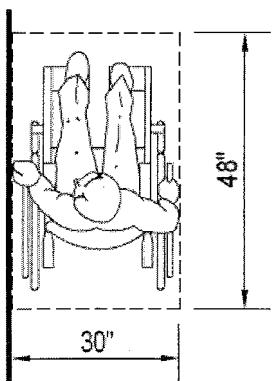
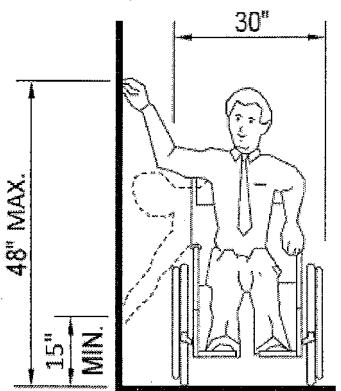


FIGURE 11A-11  
FORWARD REACH

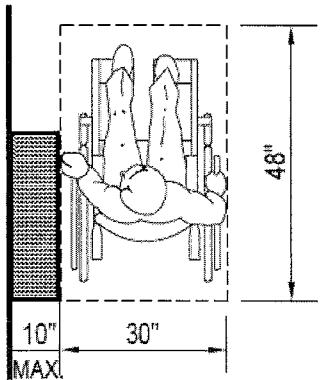


CLEAR FLOOR SPACE FOR PARALLEL APPROACH

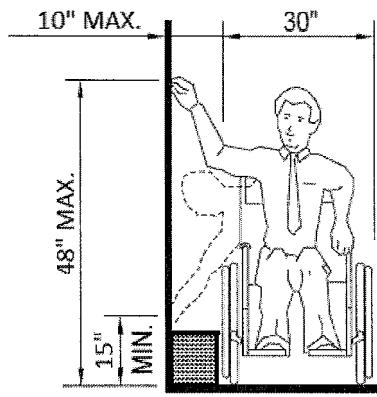


HIGH AND LOW SIDE REACH LIMITS

**(a) UNOBSTRUCTED SIDE REACH**

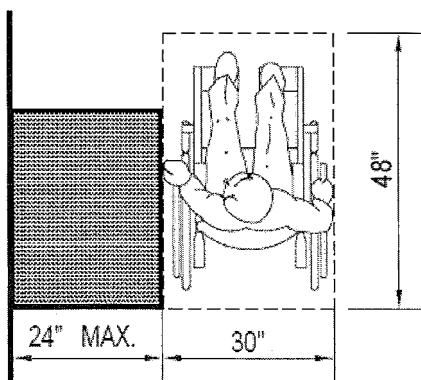


CLEAR FLOOR SPACE FOR PARALLEL APPROACH

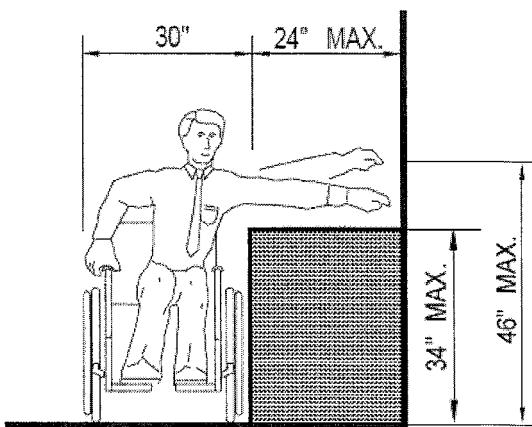


HIGH AND LOW SIDE REACH LIMITS

**(b) SIDE REACH OVER OBSTRUCTION 10" MAXIMUM**



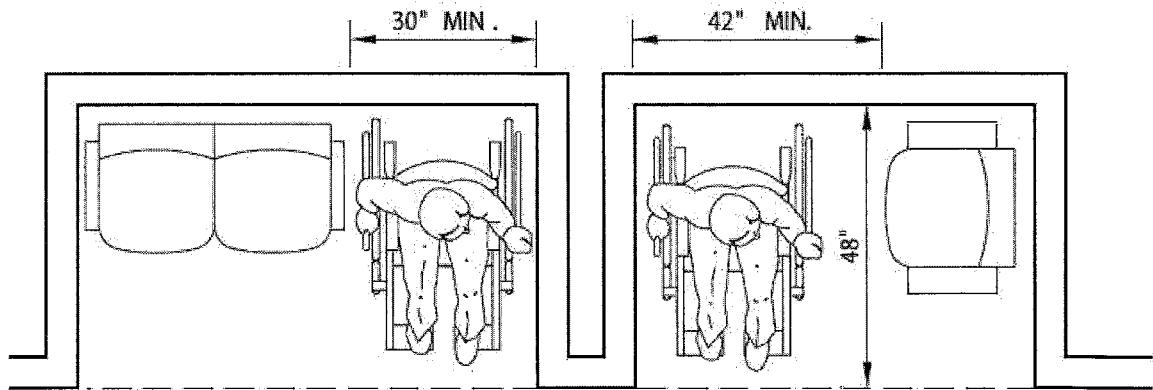
CLEAR FLOOR SPACE FOR PARALLEL APPROACH



MAXIMUM SIDE REACH OVER OBSTRUCTION

**(c) SIDE REACH OVER OBSTRUCTION > 10" AND 24" MAXIMUM**

**FIGURE 11A-1J  
SIDE REACH**



◀ ACCESSIBLE PATH OF TRAVEL ▶

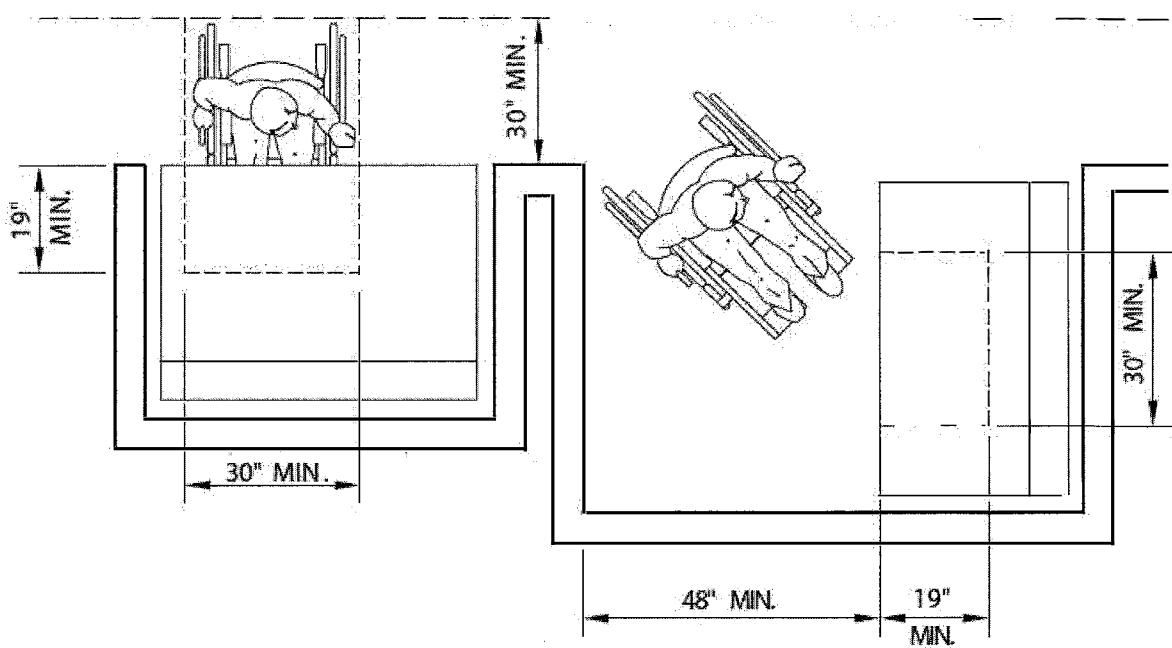
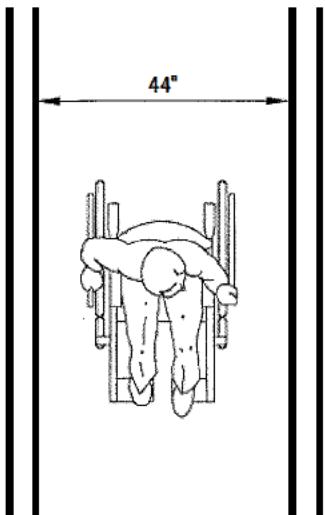
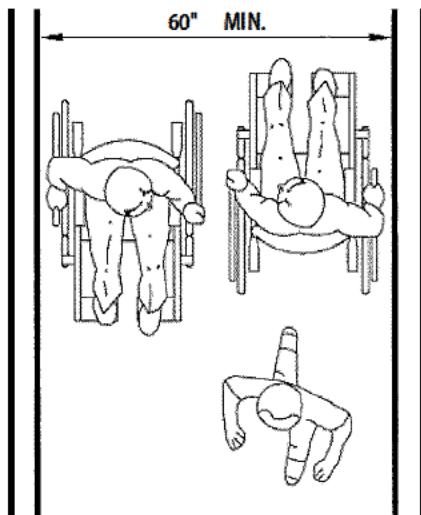


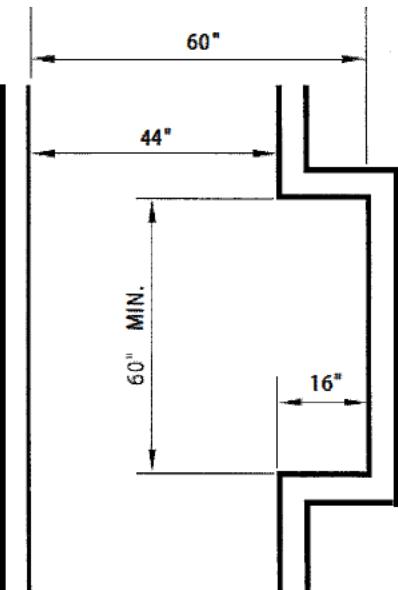
FIGURE 11A-1K  
MINIMUM CLEARANCES FOR SEATING AND TABLE



(a) MINIMUM WIDTH FOR CORRIDORS



(b) MINIMUM WIDTH FOR CORRIDORS OVER 200 FEET



(c) PASSING METHODS FOR CORRIDORS WITH LENGTH OVER 200 FEET AND WIDTH LESS THAN 60"

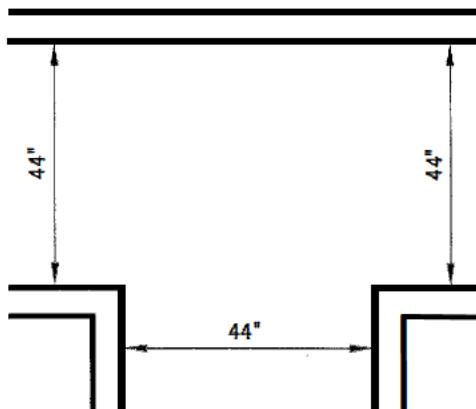
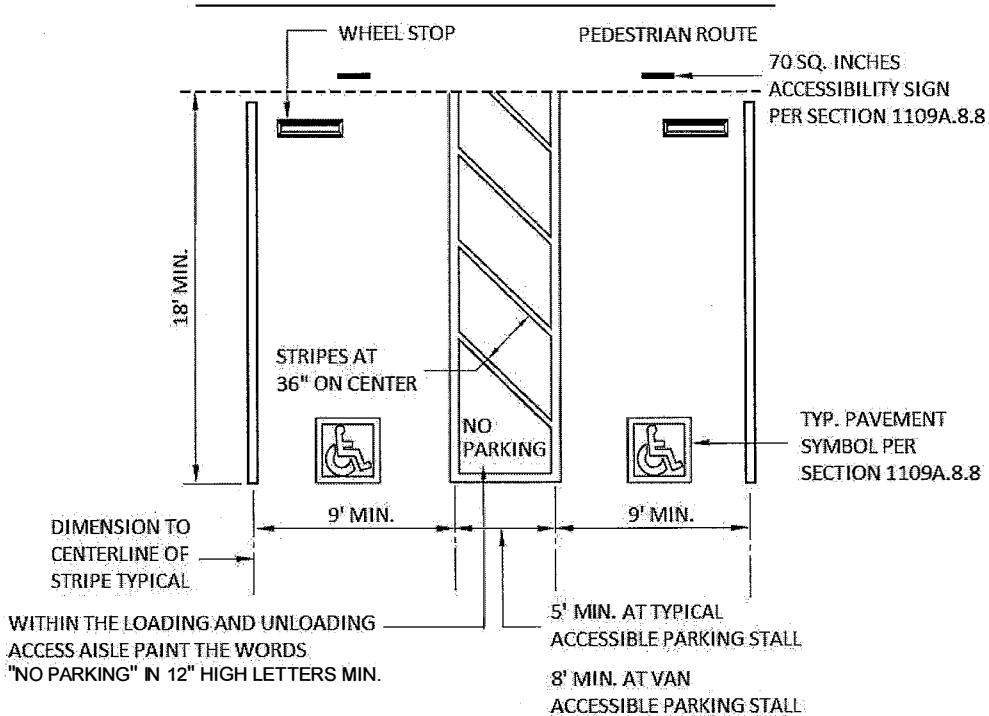
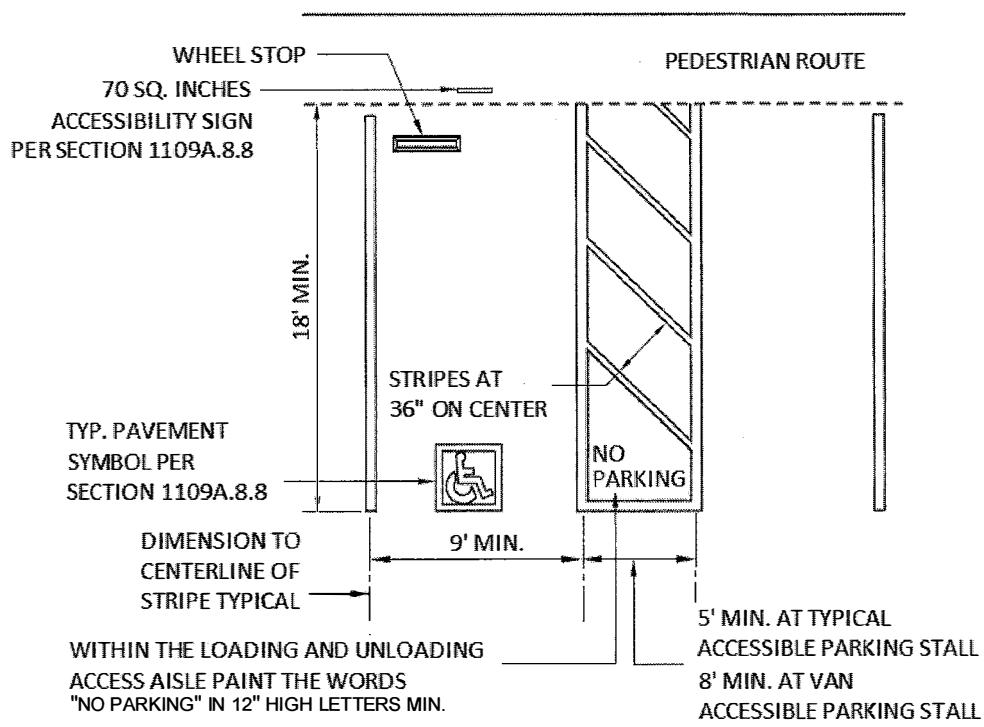


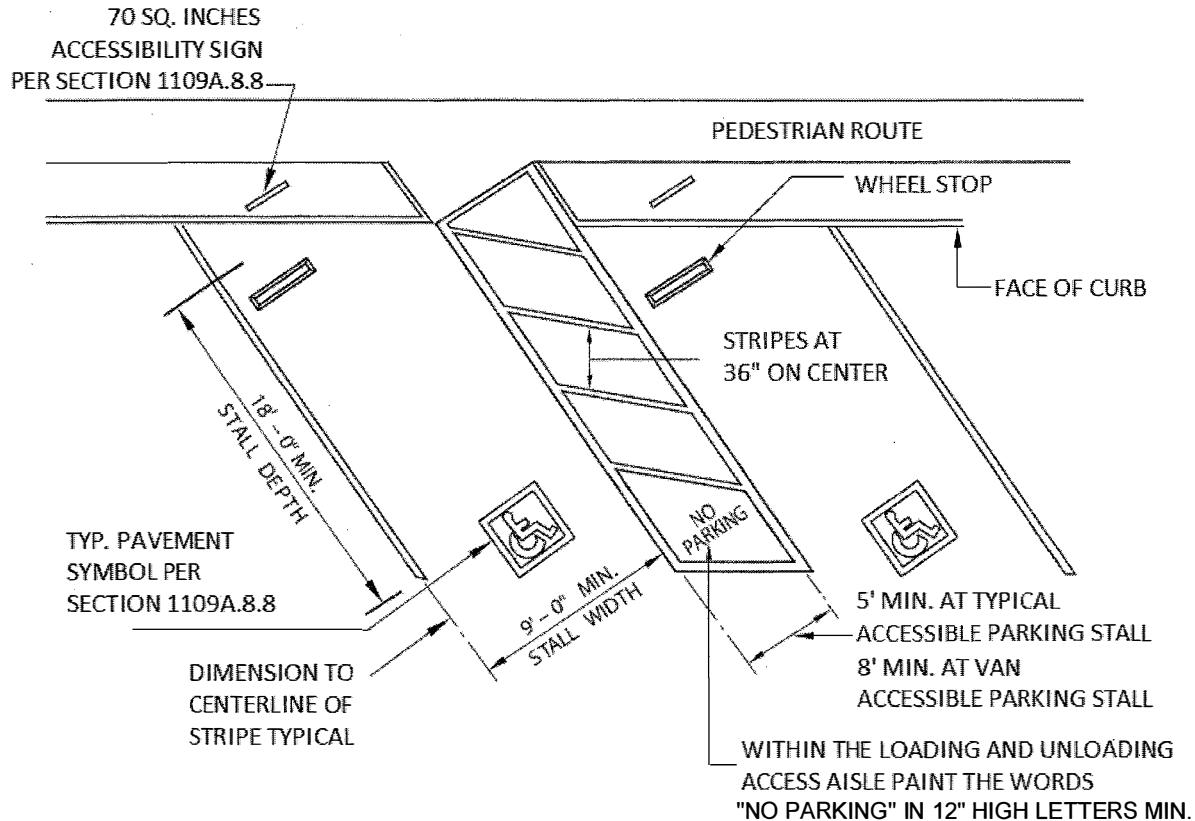
FIGURE 11A-1L  
INTERIOR ACCESSIBLE ROUTE (CORRIDOR) OVER 200 FEET; OCCUPANT LOAD 10 OR MORE



**FIGURE 11A-2A  
DOUBLE PARKING STALLS**



**FIGURE 11A-2B  
SINGLE AND VAN ACCESSIBLE PARKING STALLS**



**FIGURE 11A-2C  
DIAGONAL PARKING STALLS**

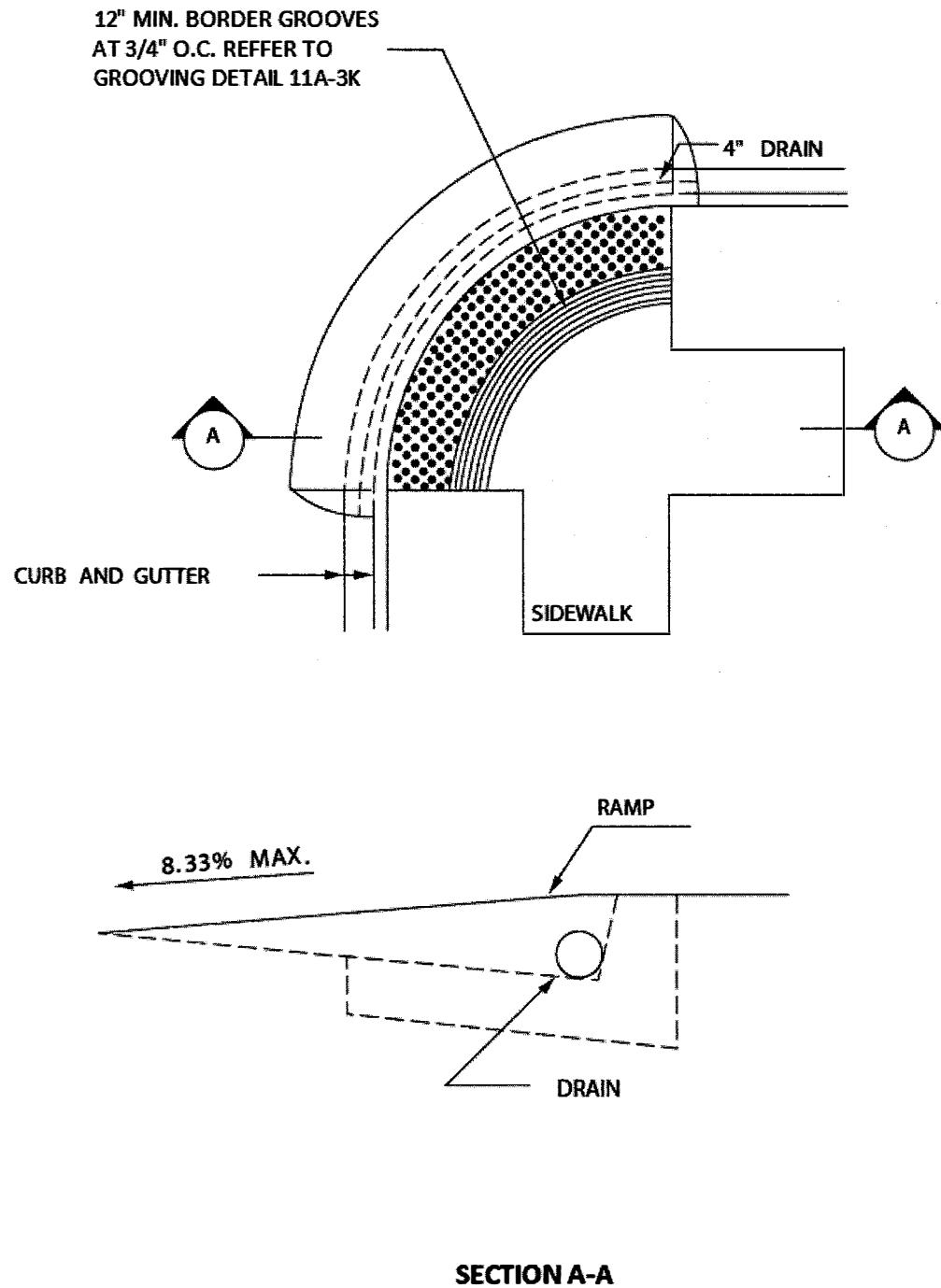


FIGURE 11A-3A  
CURB DETAILS

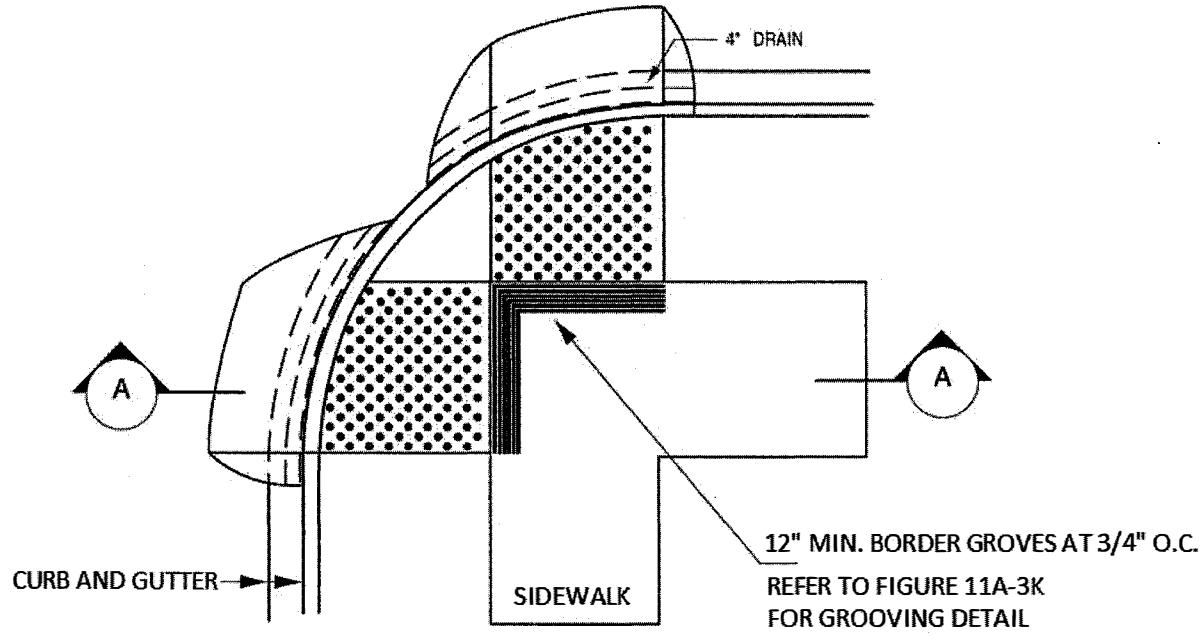
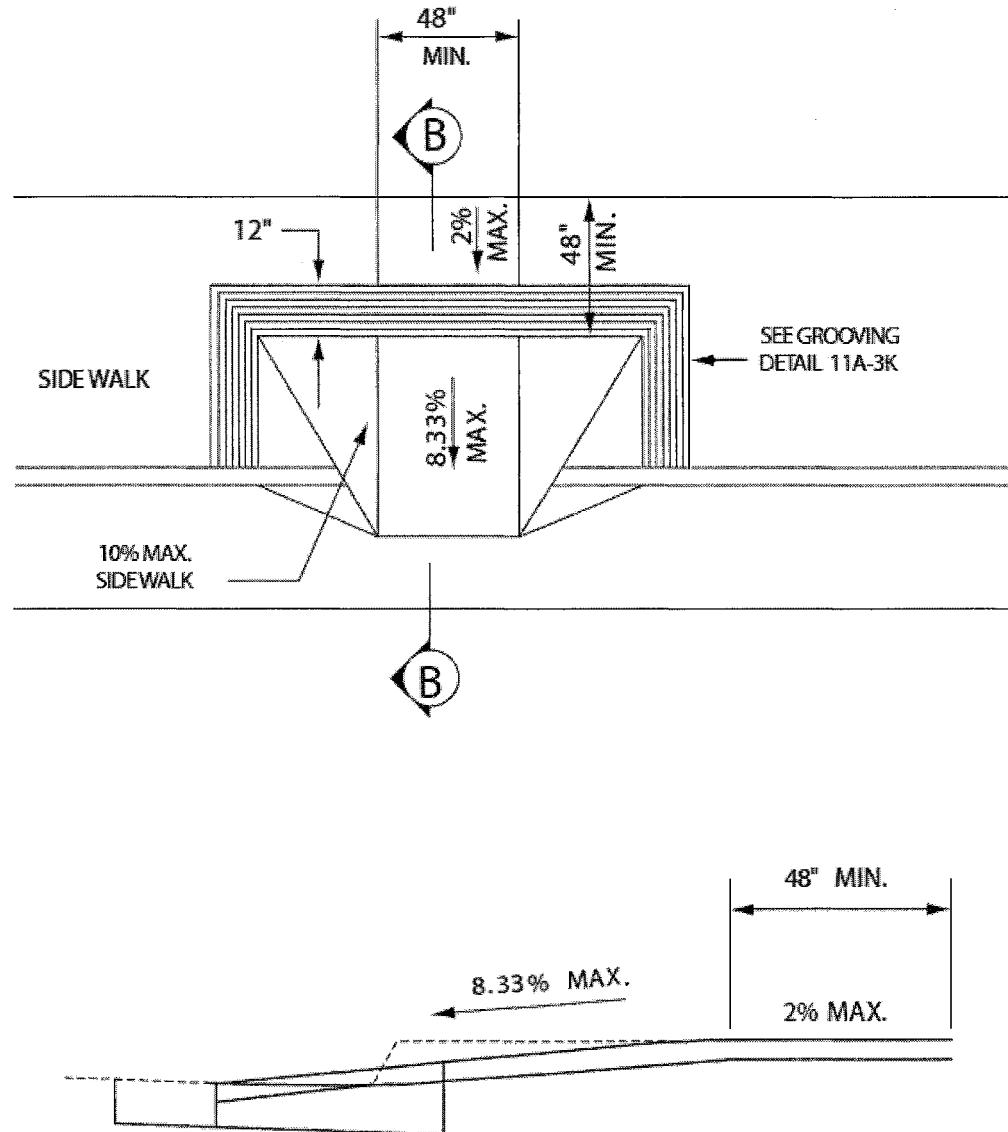
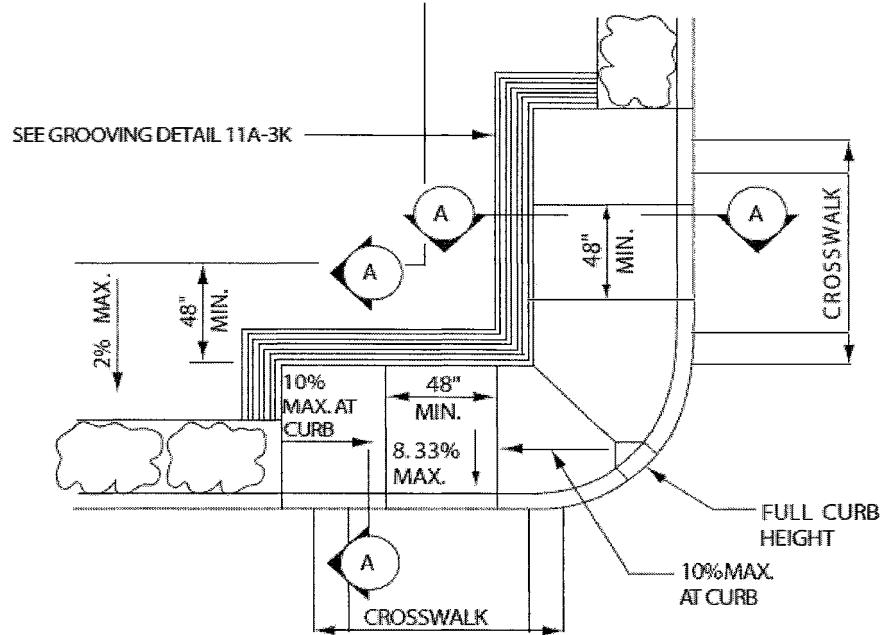
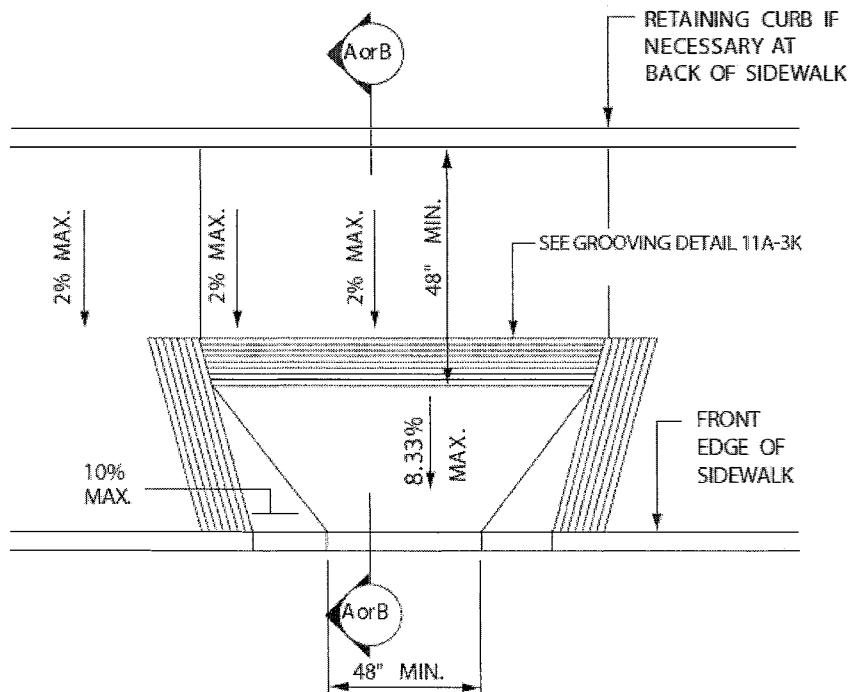


FIGURE 11A-3B  
CURB DETAIL

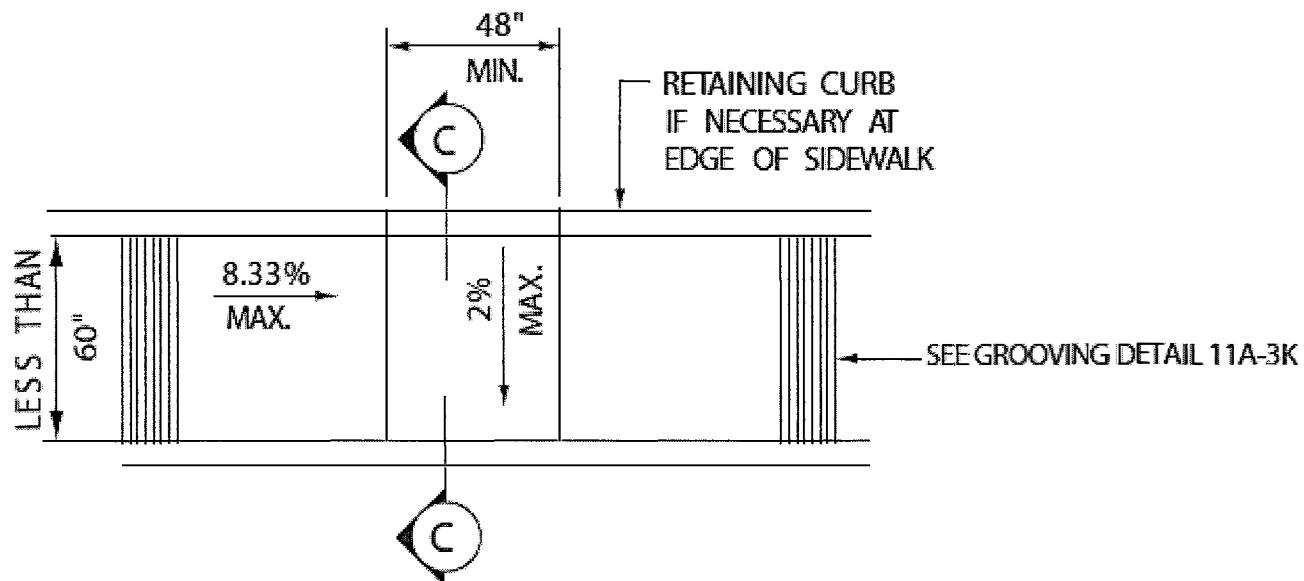


SECTION B-B

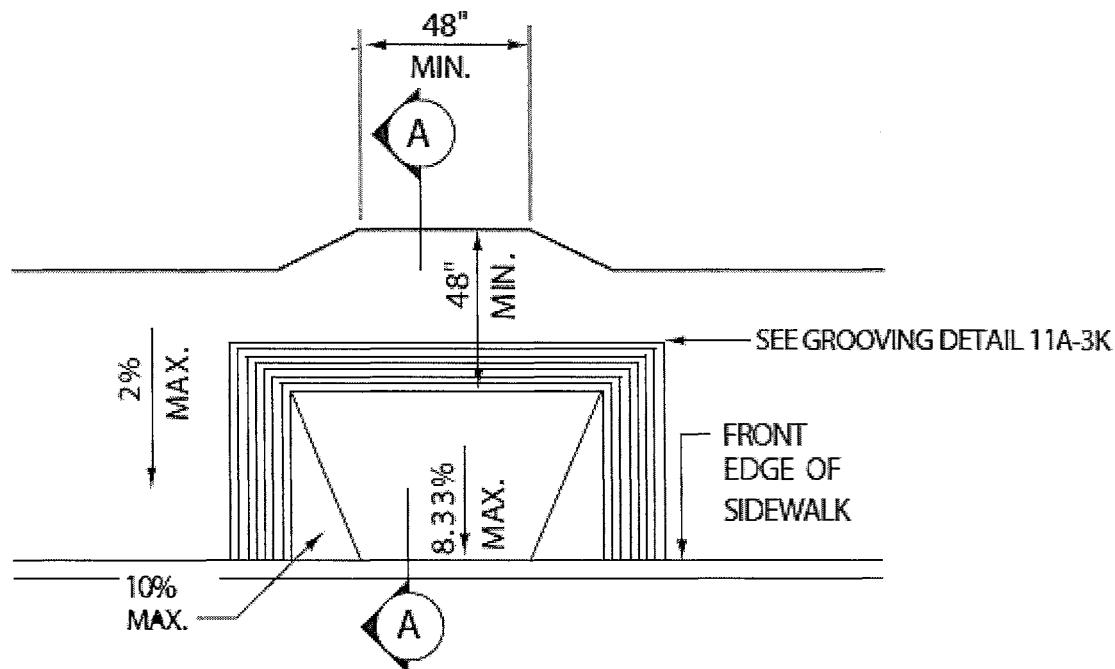
FIGURE 11A-3C  
CURB DETAIL

FIGURE 11A-3D  
CURB DETAILFIGURE 11A-3E  
CURB DETAIL

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**FIGURE 11A-3F**  
**CURB DETAIL - SIDEWALK LESS THAN 60" WIDE**



**FIGURE 11A-3G**  
**CURB DETAIL**

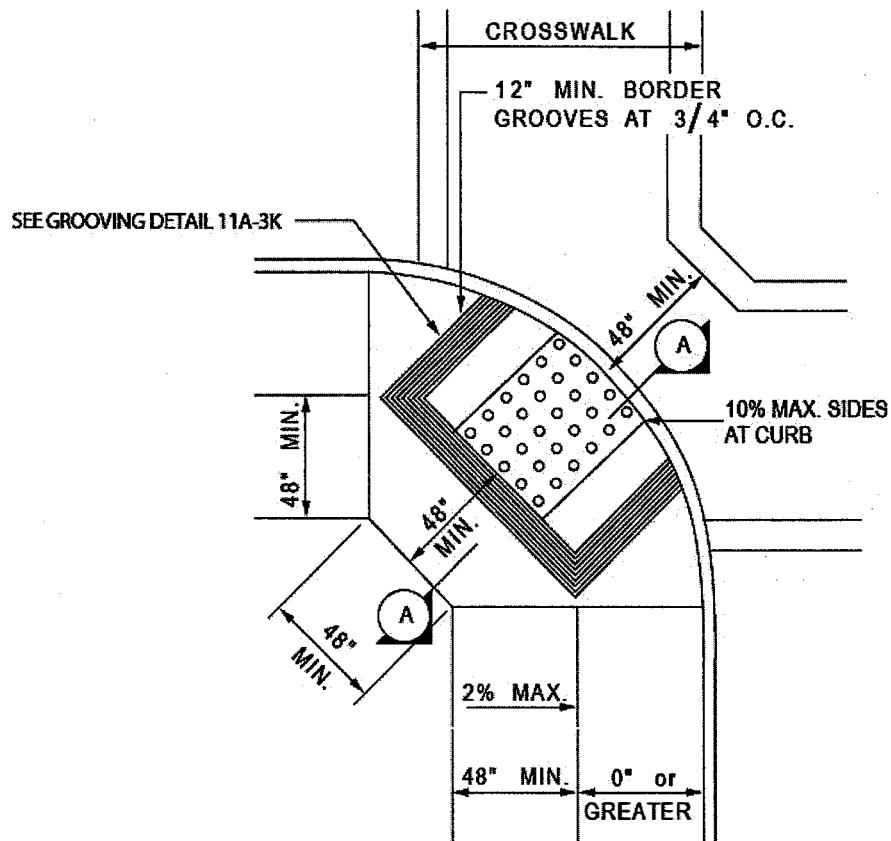


FIGURE 11A-3H  
CURB DETAIL

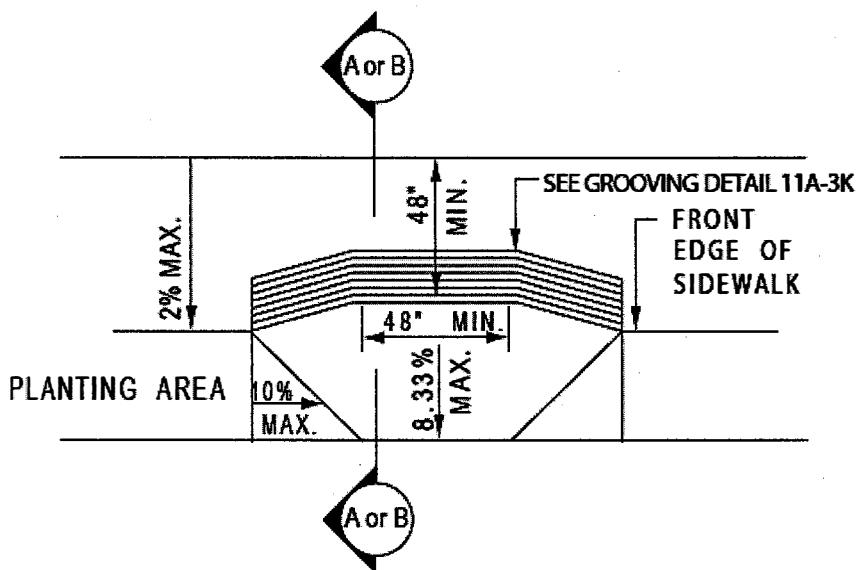
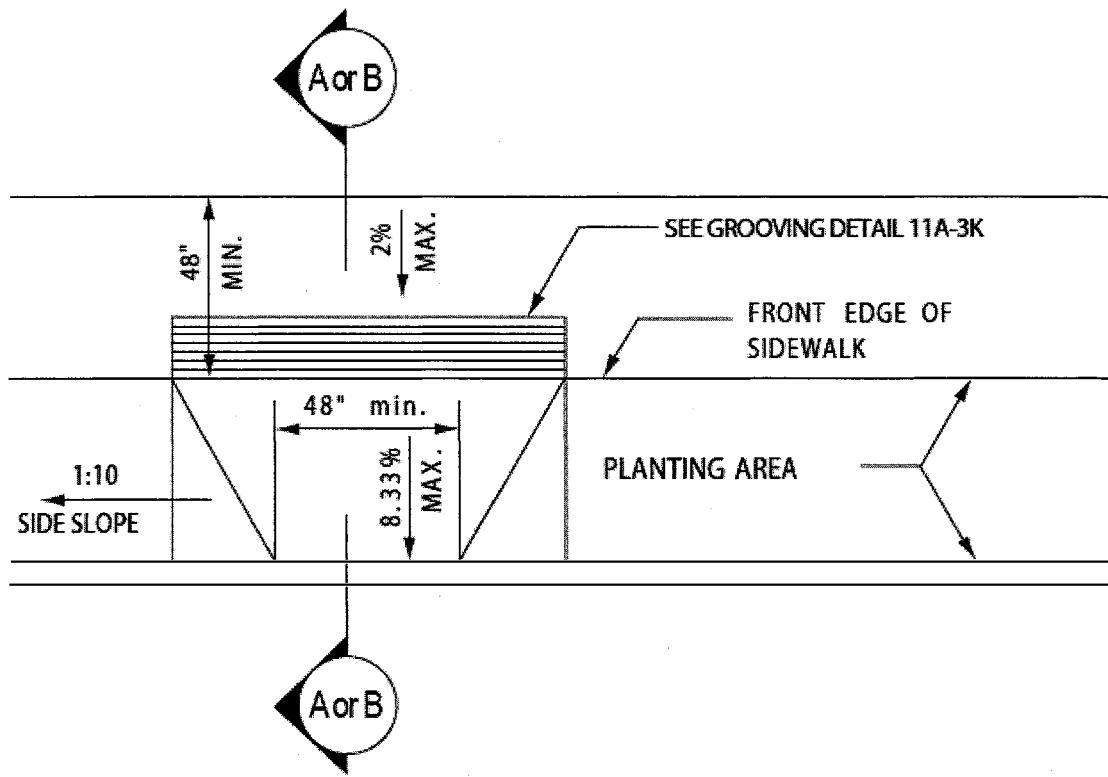
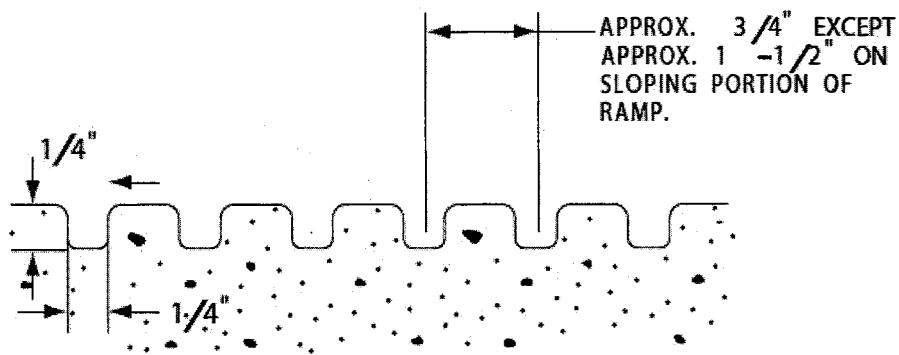


FIGURE 11A-3I  
CURB DETAIL

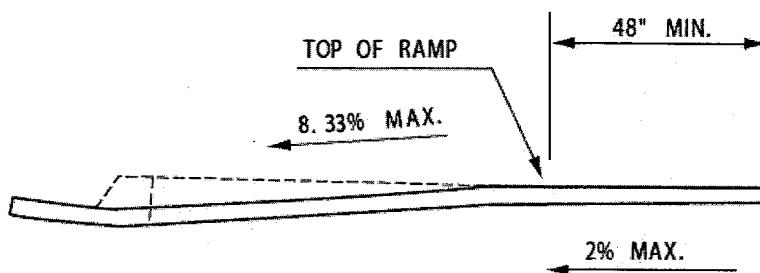


**FIGURE 11A-3J**  
**CURB DETAIL**

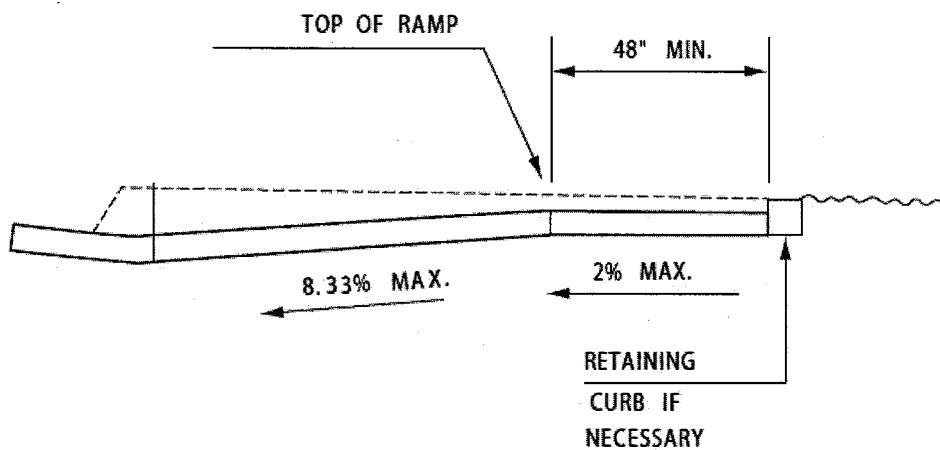


**GROOVING DETAIL**

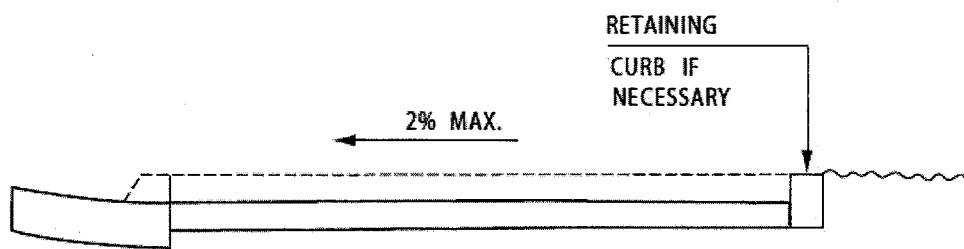
**FIGURE 11A-3K**  
**CURB DETAIL**



**SECTION A-A**

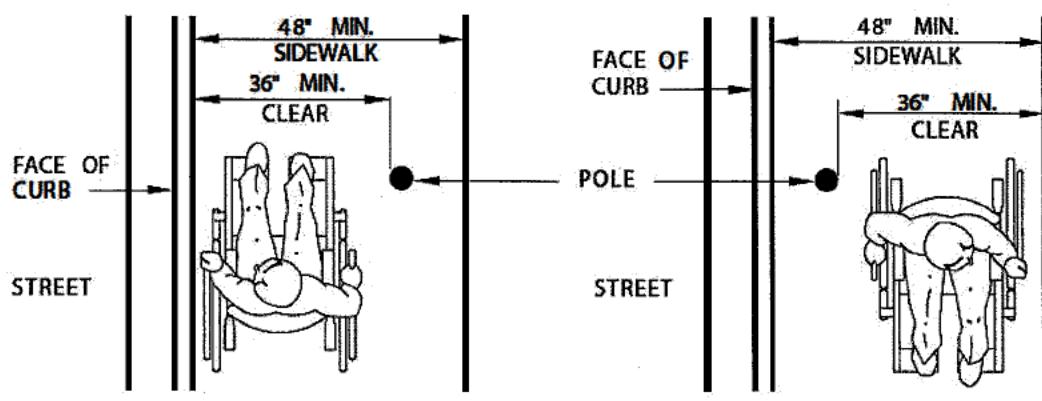


**SECTION B-B**  
**DEPRESS ENTIRE SIDEWALK AS REQUIRED**

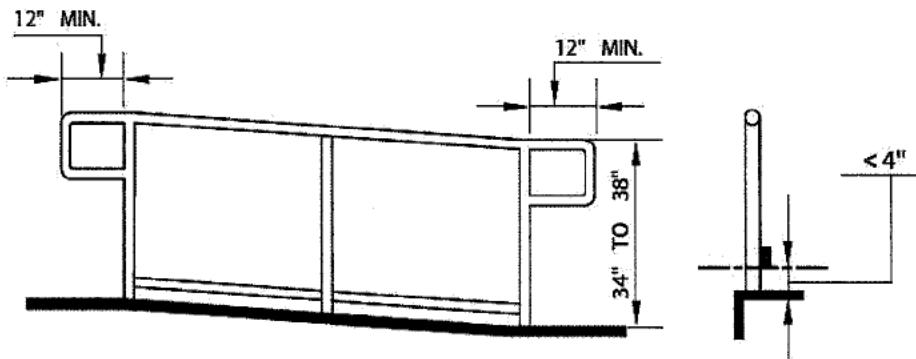


**SECTION C-C**

**FIGURE 11A-3L  
CURB SECTIONS**

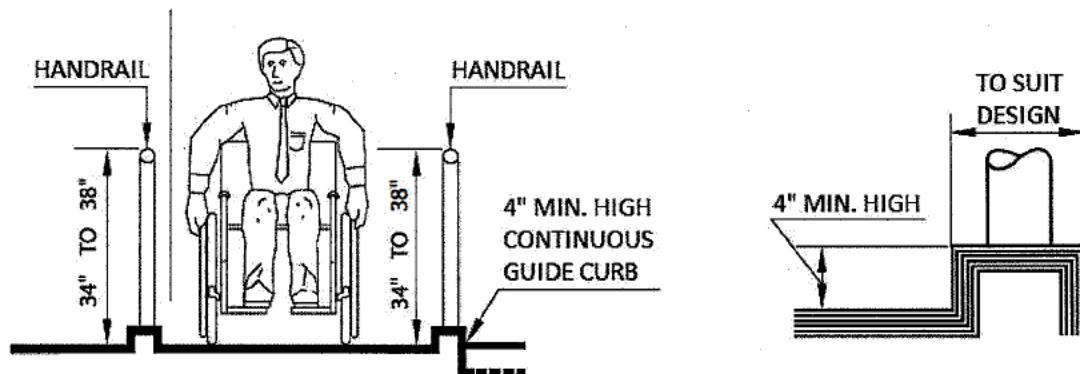


(a) SIDEWALK OBSTRUCTIONS



(b) HANDRAIL AND GUIDERAIL

GUIDE RAIL DETAIL



(c) GUIDE CURB

GUIDE CURB DETAIL

FIGURE 11A-5A  
RAMPS AND SIDEWALKS

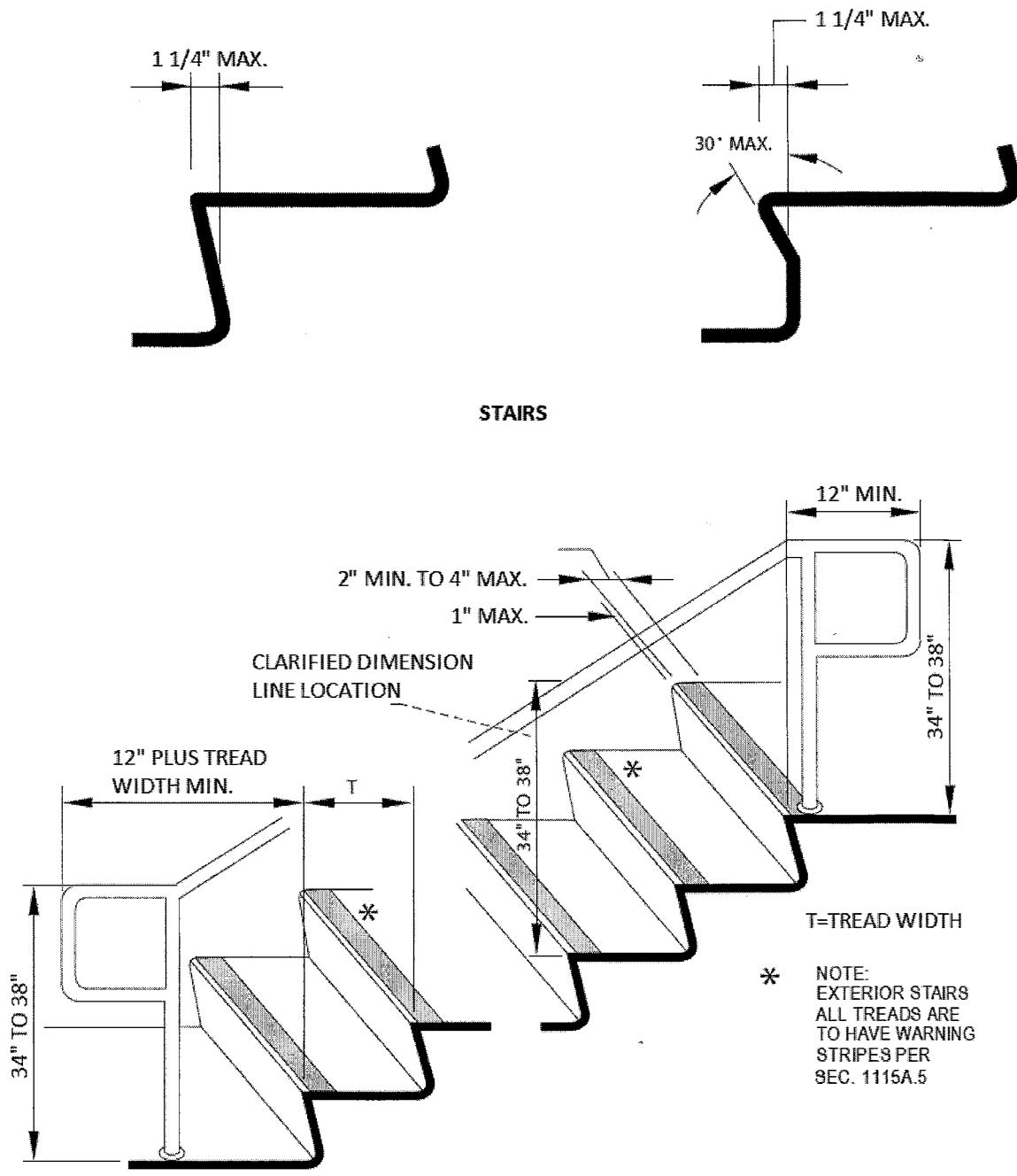
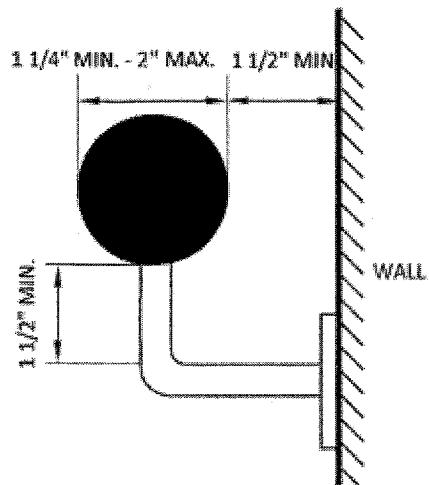
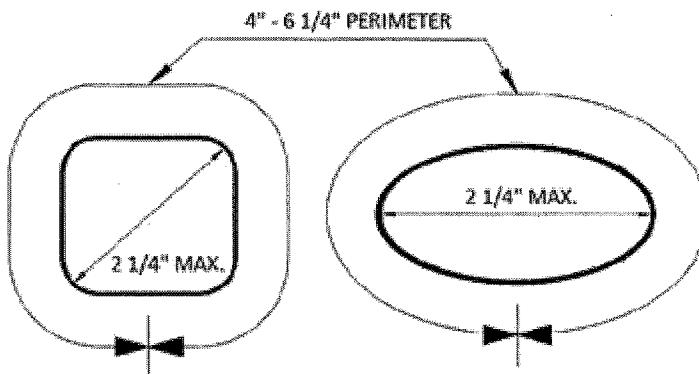


FIGURE 11A-6A  
WARNING STRIPING AND HANDRAIL EXTENSIONS

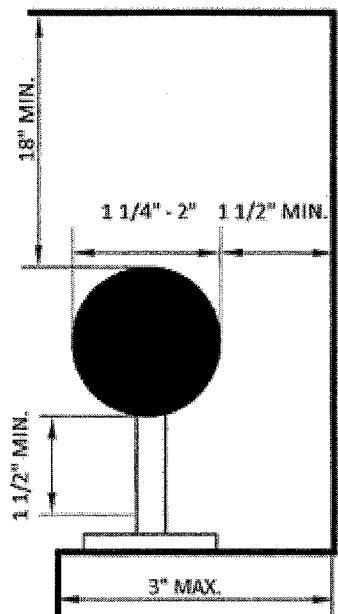
## HOUSING ACCESSIBILITY



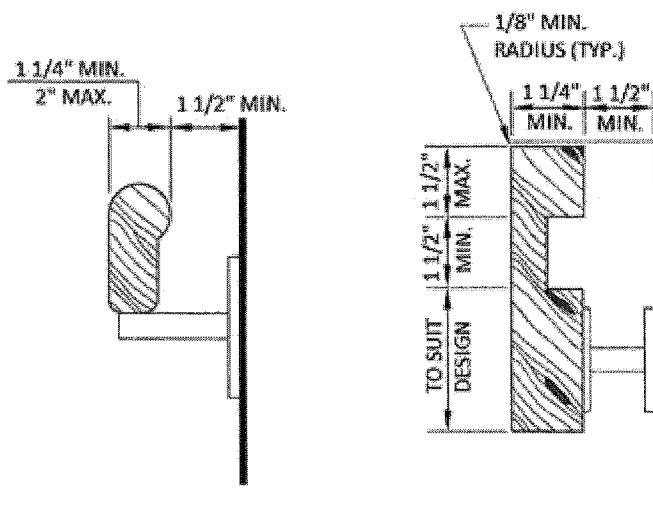
(a) HANDRAILS WITH CIRCULAR CROSS SECTION



(b) HANDRAILS WITH NON-CIRCULAR CROSS SECTION



(c) HANDRAILS LOCATED IN A RECESS

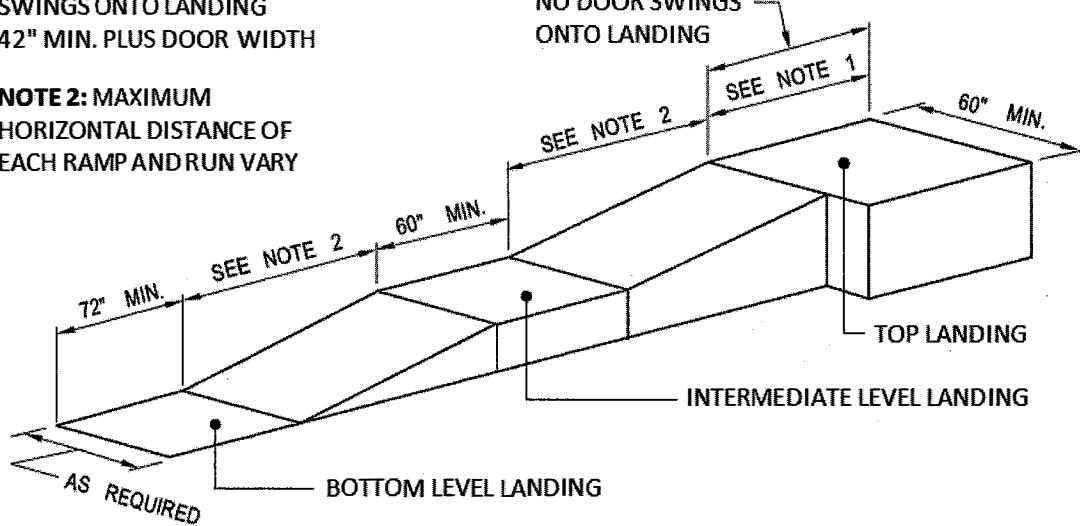


(d) HANDRAILS WITH EQUIVALENT GRIPPING SURFACES

FIGURE 11A-6B  
HANDRAILS

**NOTE 1:** WHEN DOOR SWINGS ONTO LANDING  
42" MIN. PLUS DOOR WIDTH

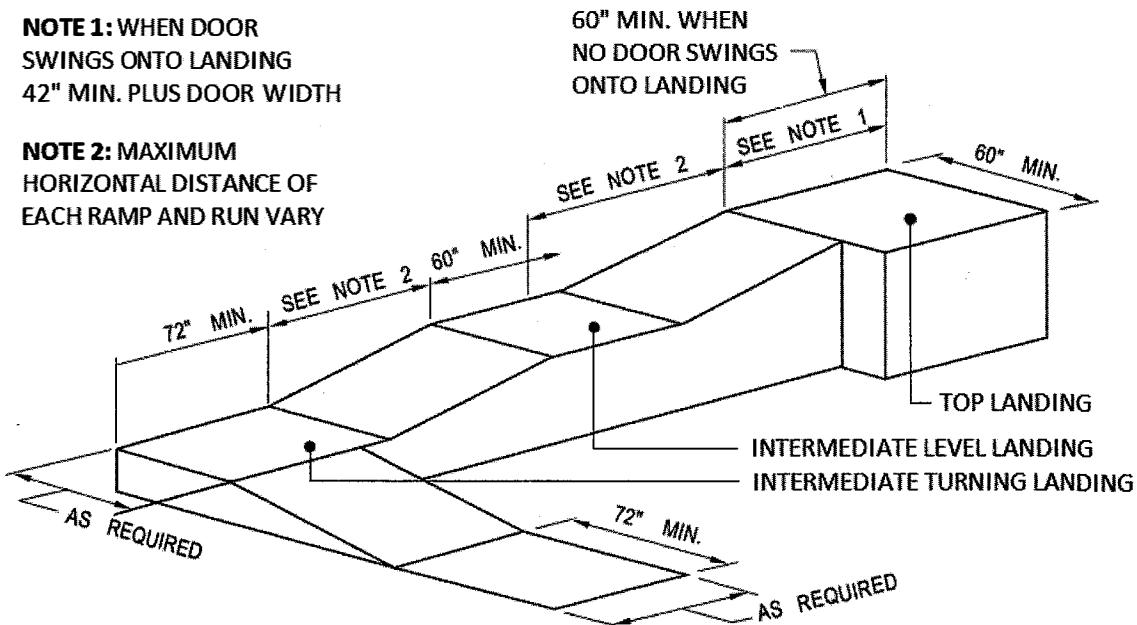
**NOTE 2:** MAXIMUM HORIZONTAL DISTANCE OF EACH RAMP AND RUN VARY



(a) STRAIGHT RAMP RUN

**NOTE 1:** WHEN DOOR SWINGS ONTO LANDING  
42" MIN. PLUS DOOR WIDTH

**NOTE 2:** MAXIMUM HORIZONTAL DISTANCE OF EACH RAMP AND RUN VARY

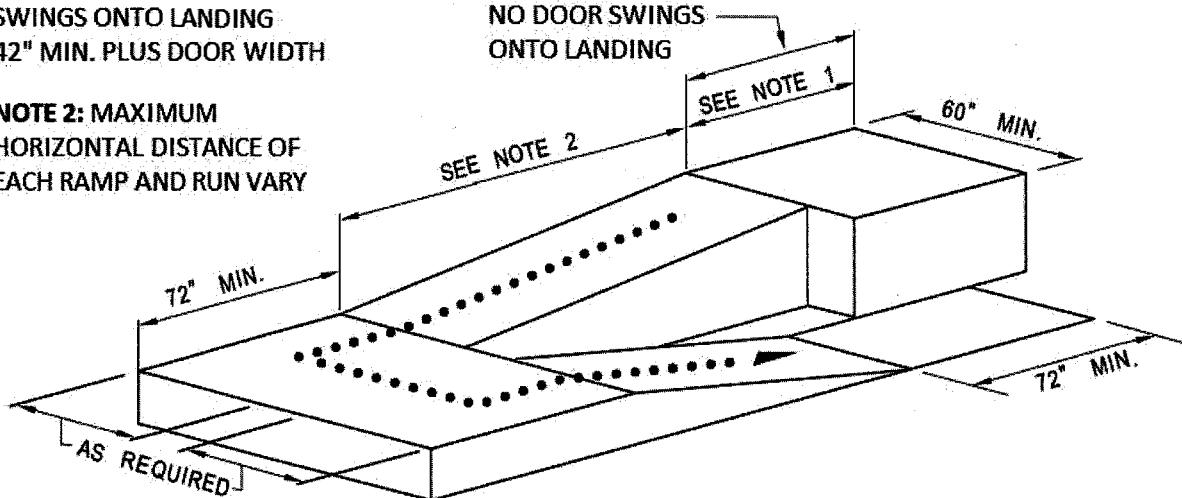


(b) RAMP WITH TURNING LANDING

FIGURE 11A-6C  
RAMP DIMENSIONS

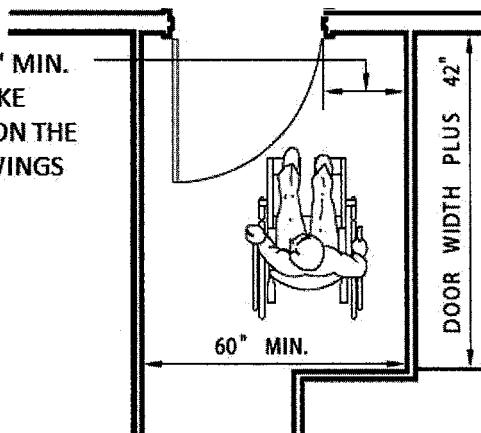
**NOTE 1:** WHEN DOOR SWINGS ONTO LANDING  
42" MIN. PLUS DOOR WIDTH

**NOTE 2:** MAXIMUM HORIZONTAL DISTANCE OF EACH RAMP AND RUN VARY



(a) RAMP WITH INTERMEDIATE SWITCH BACK LANDING

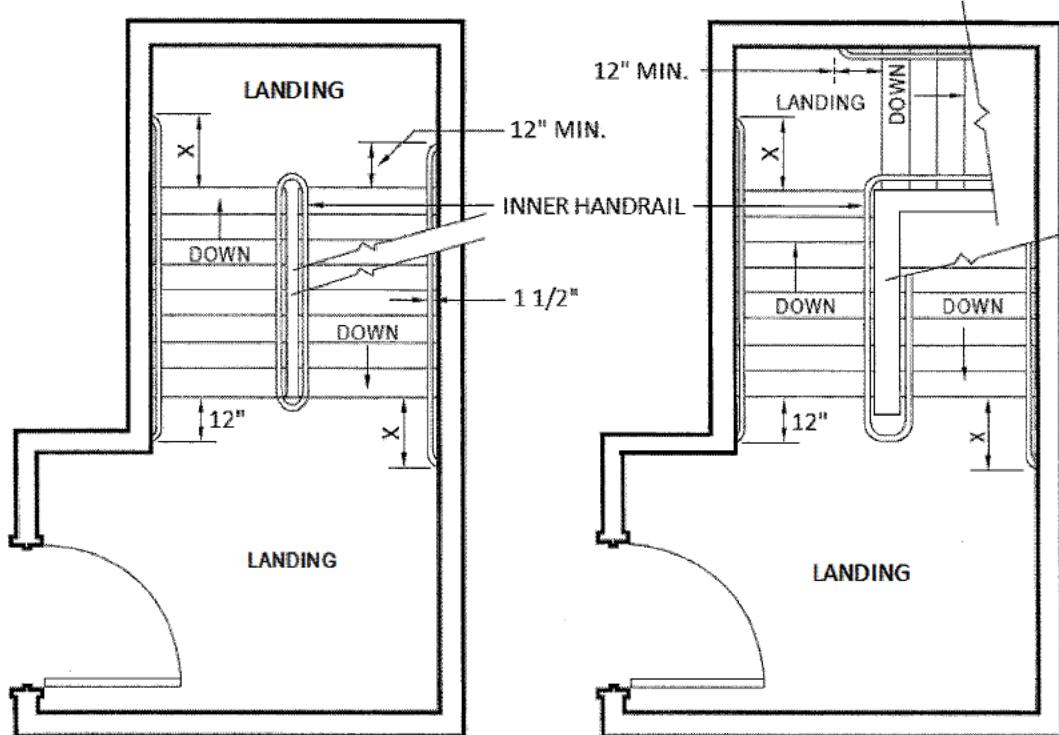
24" MIN. EXTERIOR AND 18" MIN. INTERIOR BEYOND THE STRIKE EDGE OF A GATE OR DOOR ON THE SIDE TOWARD WHICH IT SWINGS



(b) RAMP LANDING AT DOORWAY

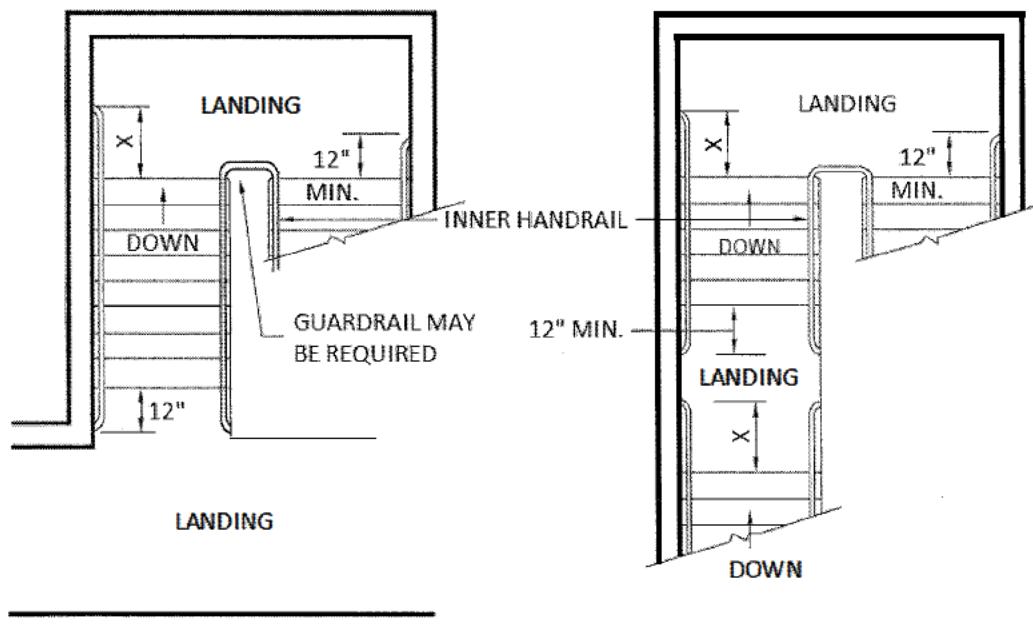
FIGURE 11A-6D  
RAMP LANDING AND DOORWAY

Text and Figures continue on page 488

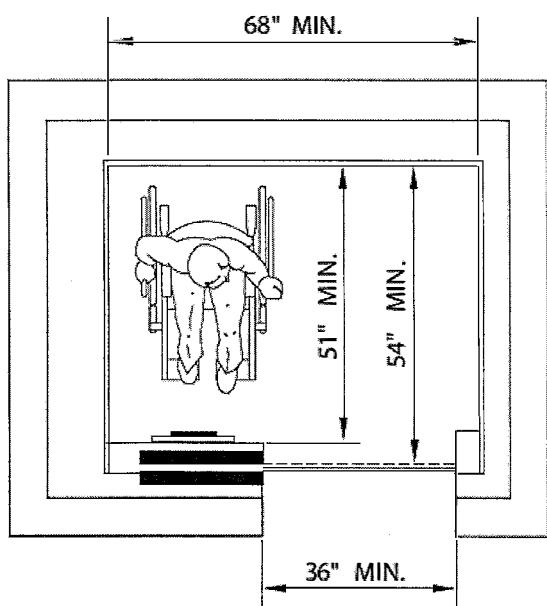


**NOTE:** INNER HANDRAIL AT LANDINGS OF STAIRS THAT DOUBLE BACK OR IMMEDIATELY TURN SHALL BE CONTINUOUS AND SHALL NOT EXTEND INTO LANDING OR PATH OF TRAVEL.

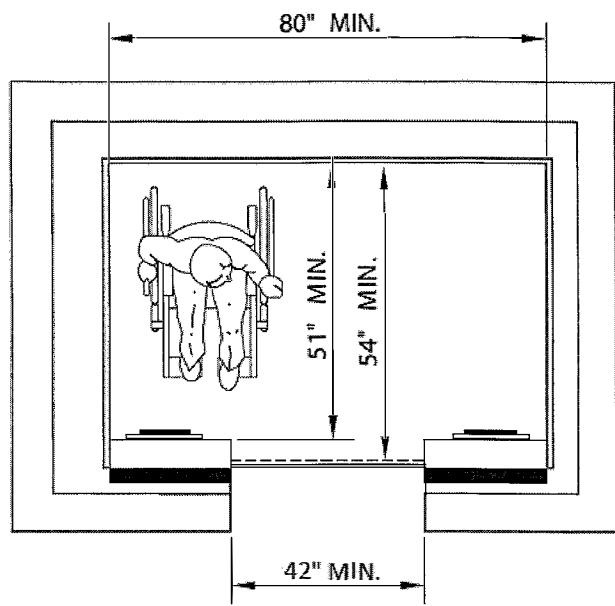
X: EXTENSION OF HANDRAIL SHALL BE EQUAL TO THE TREAD WIDTH PLUS 12".



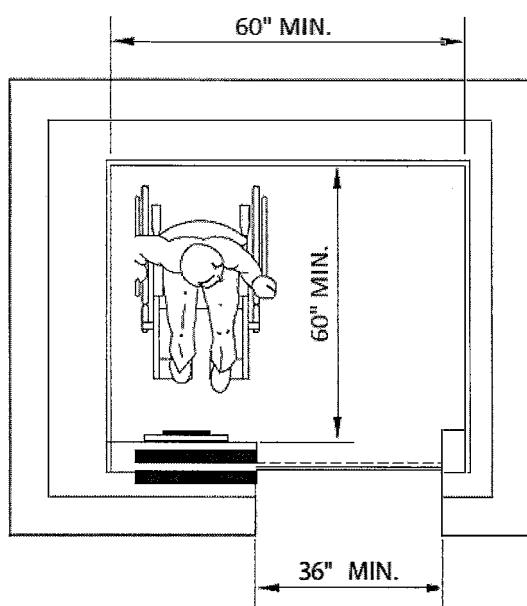
**FIGURE 11A-6E  
STAIR HANDRAILS**



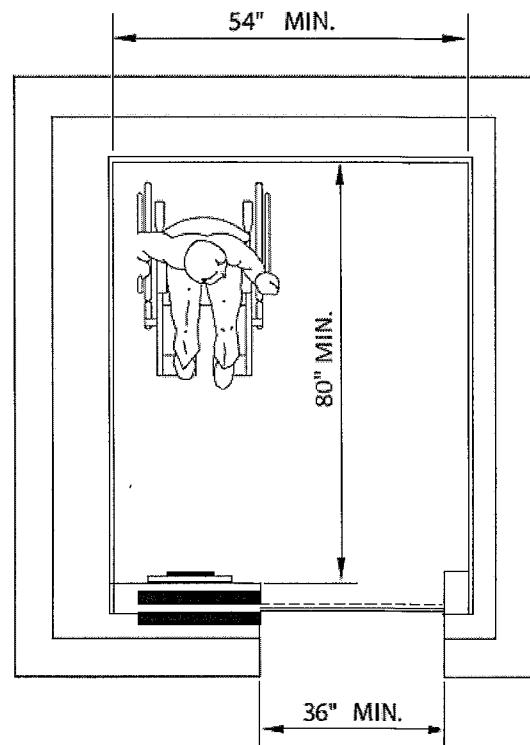
(a) SIDE OPENING DOOR

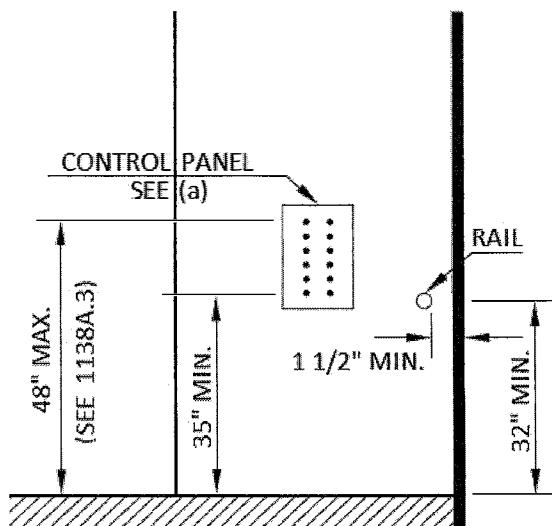
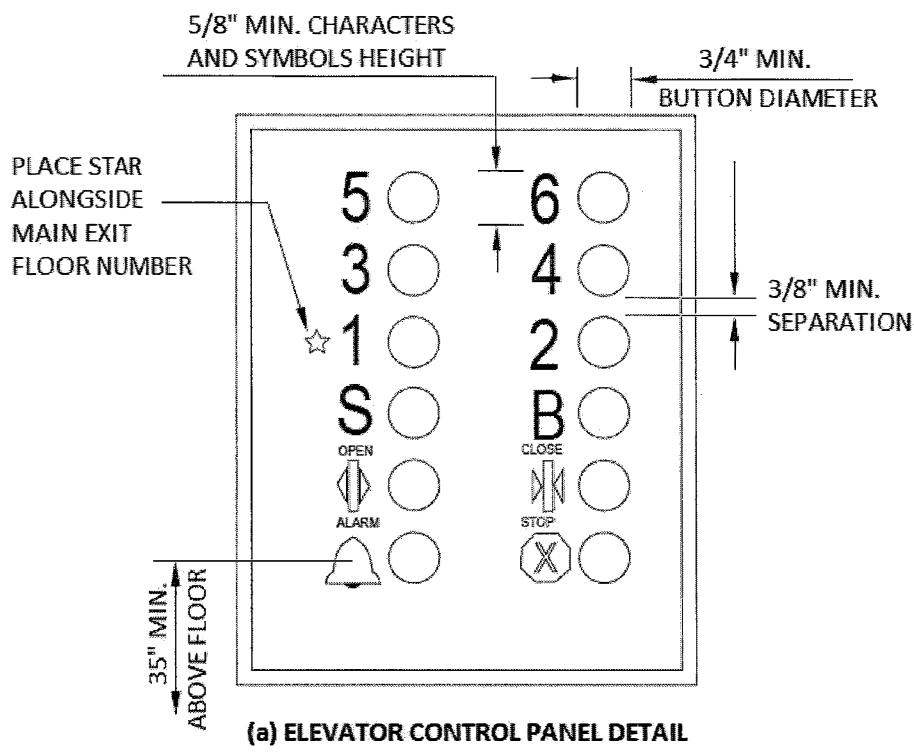


(b) CENTER OPENING DOOR



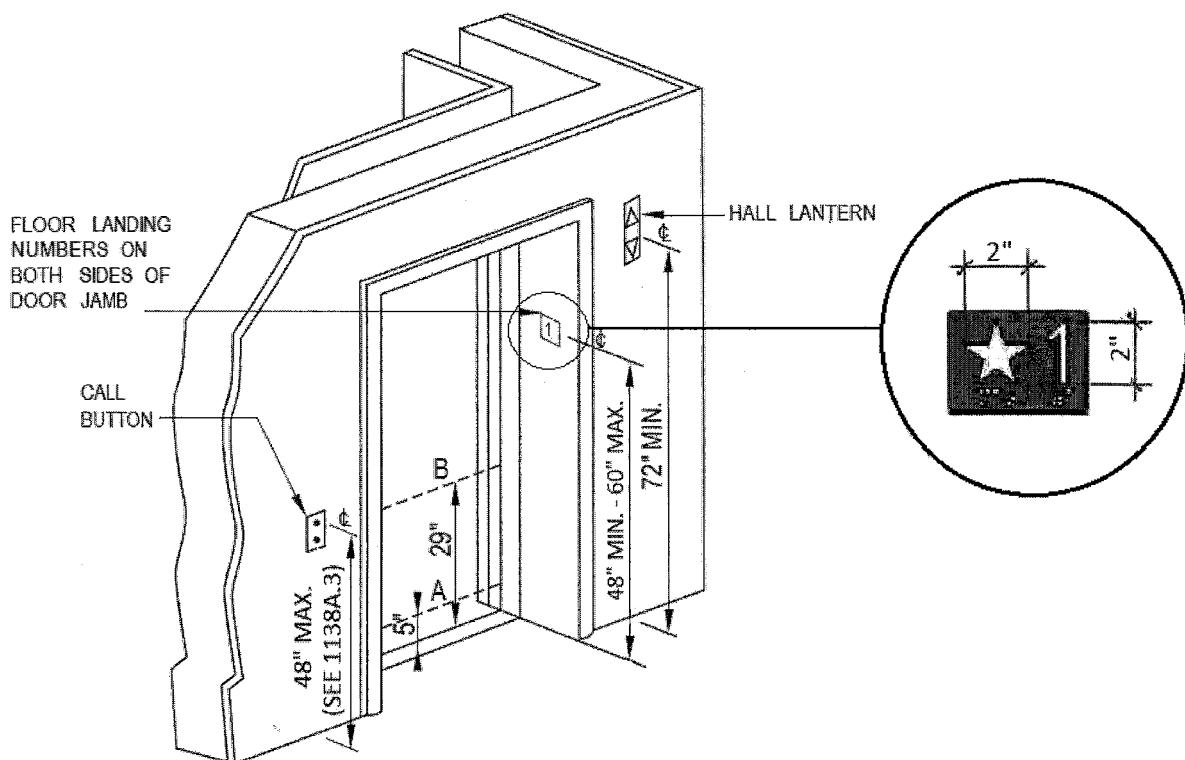
(c) DOOR AT ANY LOCATION

FIGURE 11A-7A  
MINIMUM DIMENSIONS OF ELEVATOR CARS



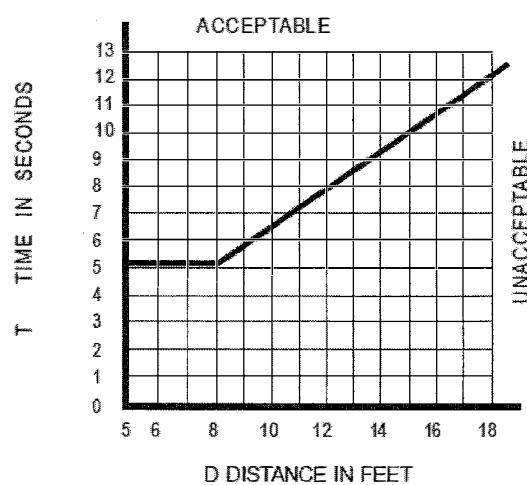
(b) MAXIMUM INSTALLATION HEIGHTS ABOVE CAB FLOOR

FIGURE 11A-7B  
ELEVATOR CONTROL PANEL

**NOTE:**

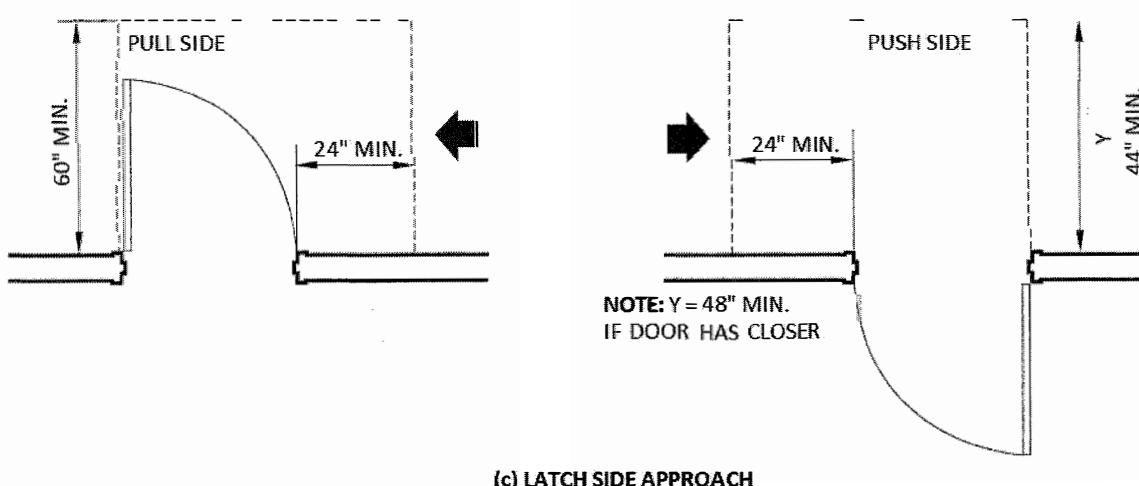
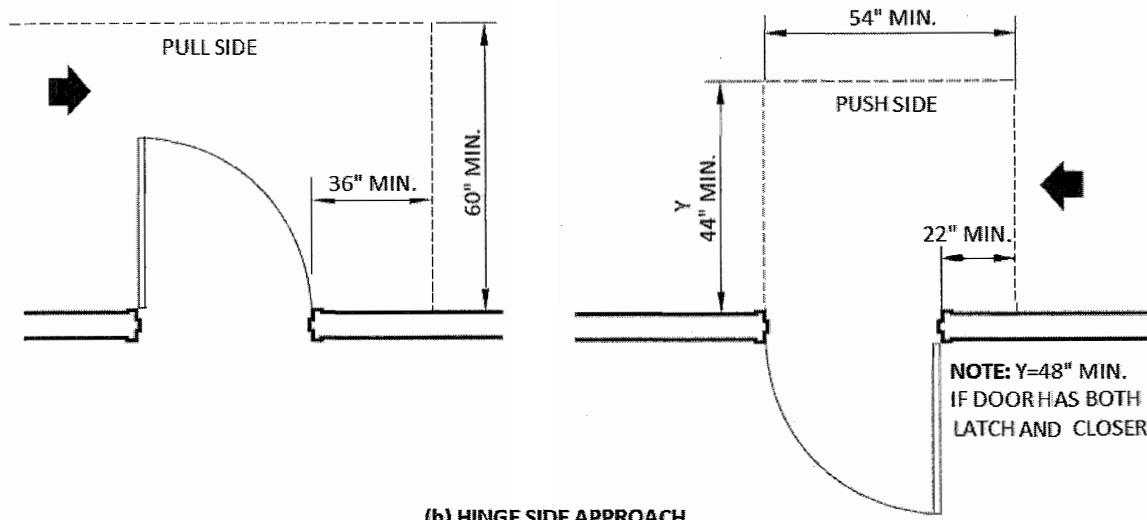
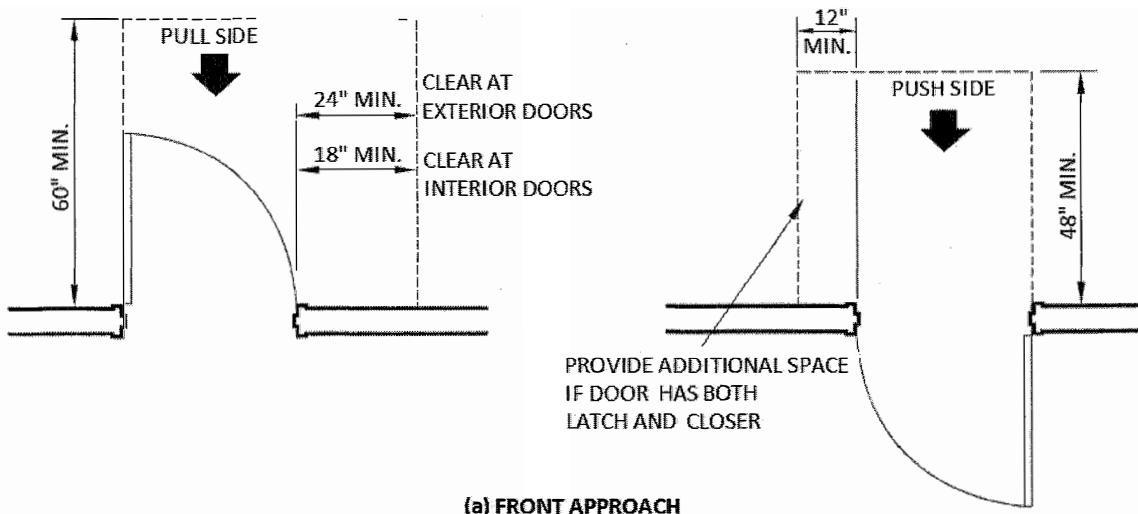
THE AUTOMATIC DOOR REOPENING DEVICE IS ACTIVATED IF AN OBJECT PASSES THROUGH EITHER LINE A OR LINE B. LINE A AND LINE B REPRESENT THE VERTICAL LOCATION OF THE DOOR REOPENING DEVICE NOT REQUIRING CONTACT.

**FIGURE 11A-7C  
HOISTWAY AND ELEVATOR ENTRANCES**

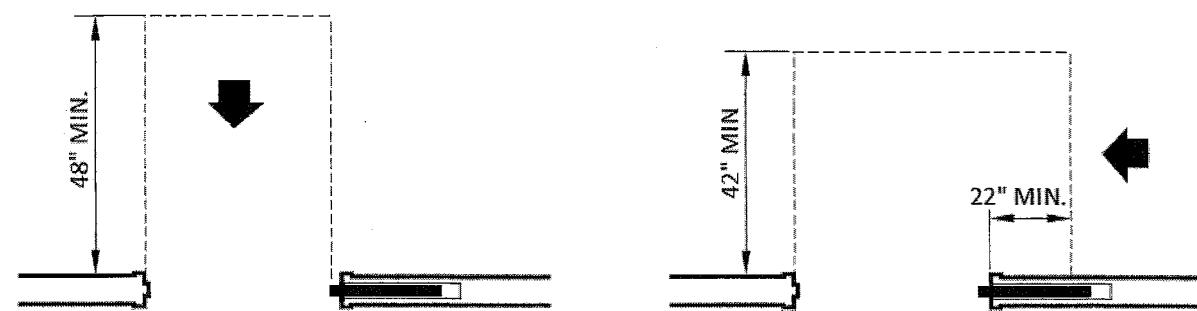


**FIGURE 11A-7D  
GRAPH OF TIMING EQUATION**

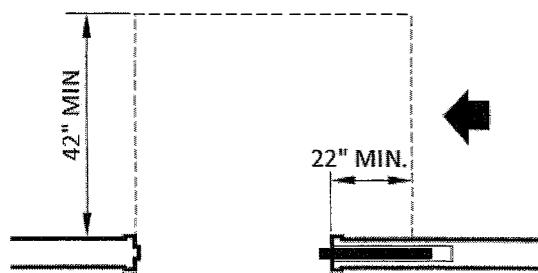
## HOUSING ACCESSIBILITY



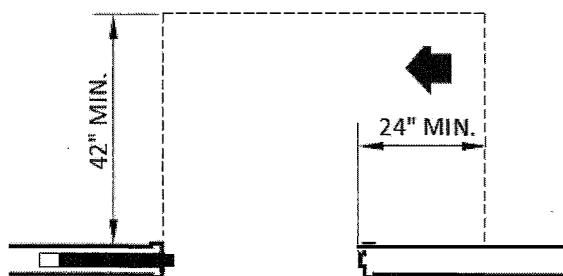
**FIGURE 11A-8A**  
**MANEUVERING CLEARANCE AT SWINGING DOORS**



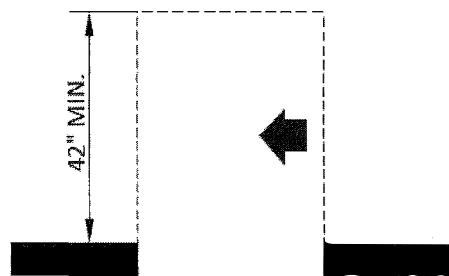
(a) FRONT APPROACH



(b) POCKET OR HINGE SIDE APPROACH

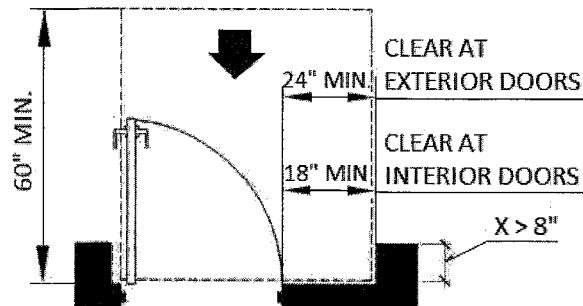


(c) STOP OR LATCH SIDE APPROACH

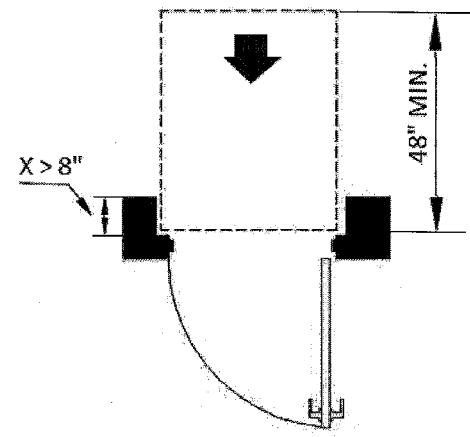


(d) SIDE APPROACH DOORWAYS WITHOUT DOORS/GATES

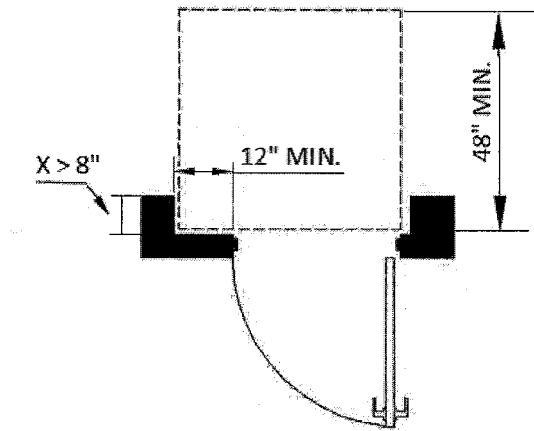
FIGURE 11A-8B  
MANEUVERING CLEARANCE AT DOORWAYS, SLIDING DOORS, AND FOLDING DOORS



(a) PULL SIDE APPROACH



(b) PUSH SIDE APPROACH

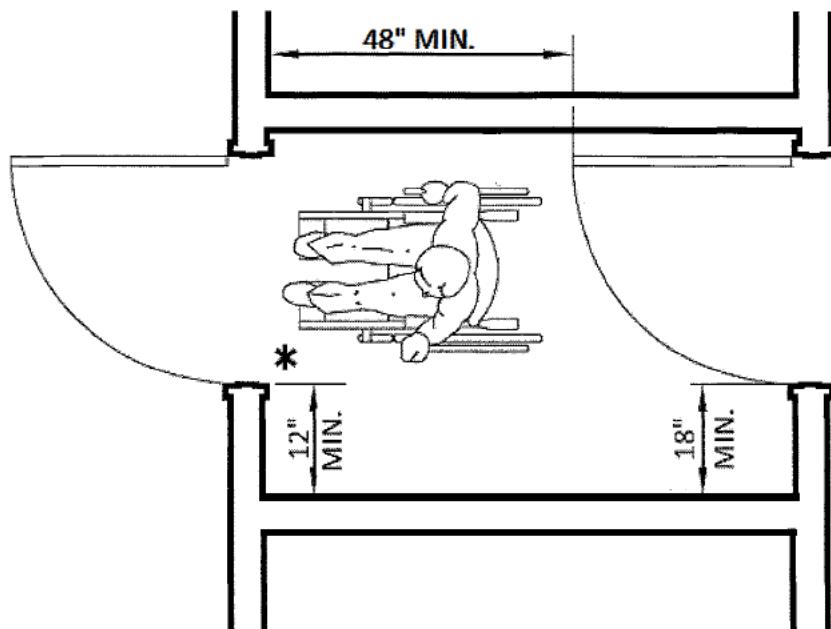


(c) PUSH SIDE APPROACH - DOOR WITH BOTH A LATCH AND A CLOSER

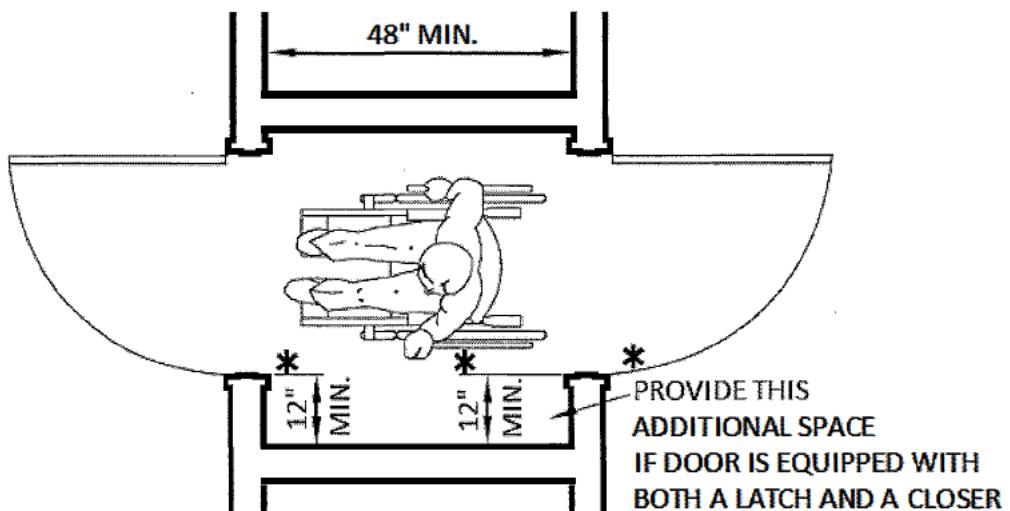
FIGURE 11A-8C  
MANEUVERING CLEARANCES AT RECESSED DOORS

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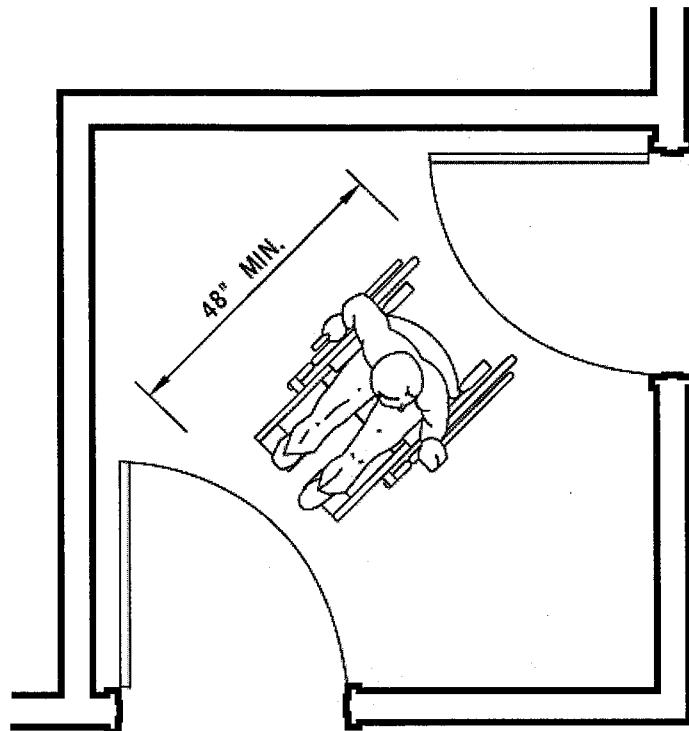
(a) DOORS IN SERIES



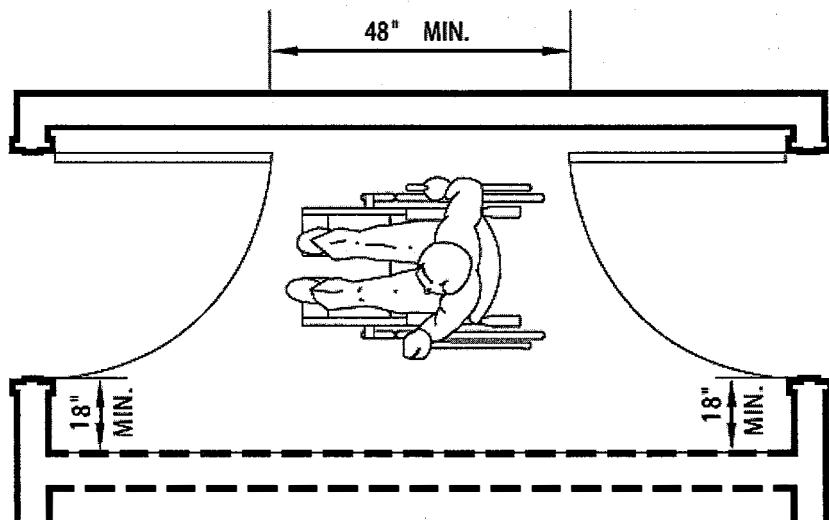
(b) BOTH DOORS OPEN OUT

(SERVING OTHER THAN A REQUIRED EXIT STAIRWAY)

FIGURE 11A-8G  
VESTIBULE



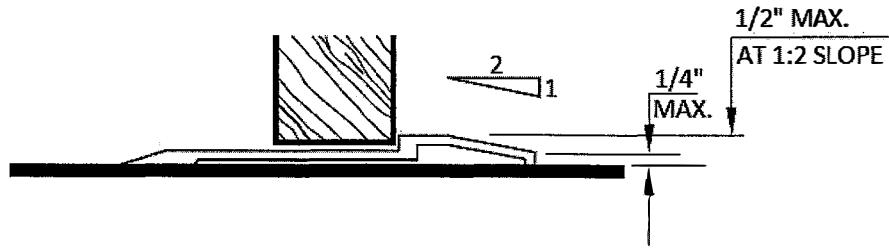
(a) DOORS AT ADJACENT WALLS



(b) DOORS AT OPPOSITE WALLS

FIGURE 11A-8H  
VESTIBULE

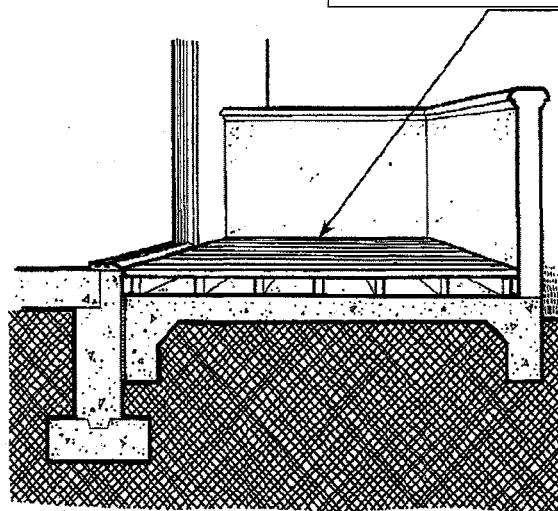
(SERVING OTHER THAN A REQUIRED EXIT STAIRWAY)



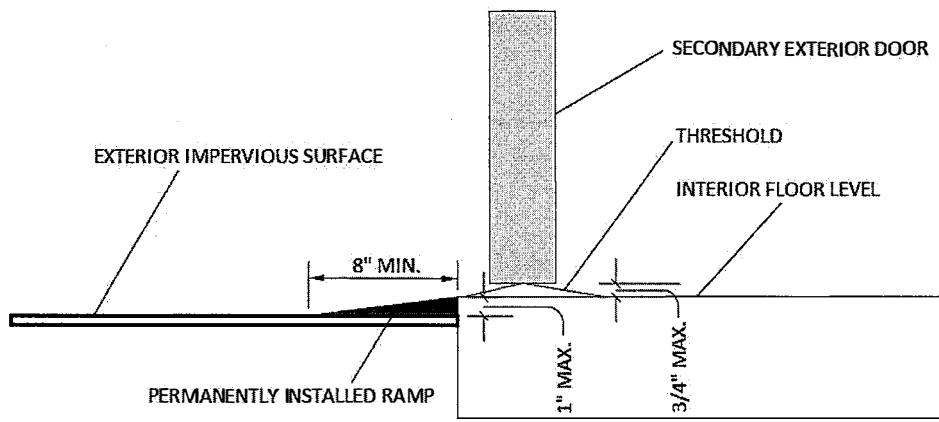
**FIGURE 11A-8I  
THRESHOLDS**

*Platform of approved materials to raise floor level of balcony.*

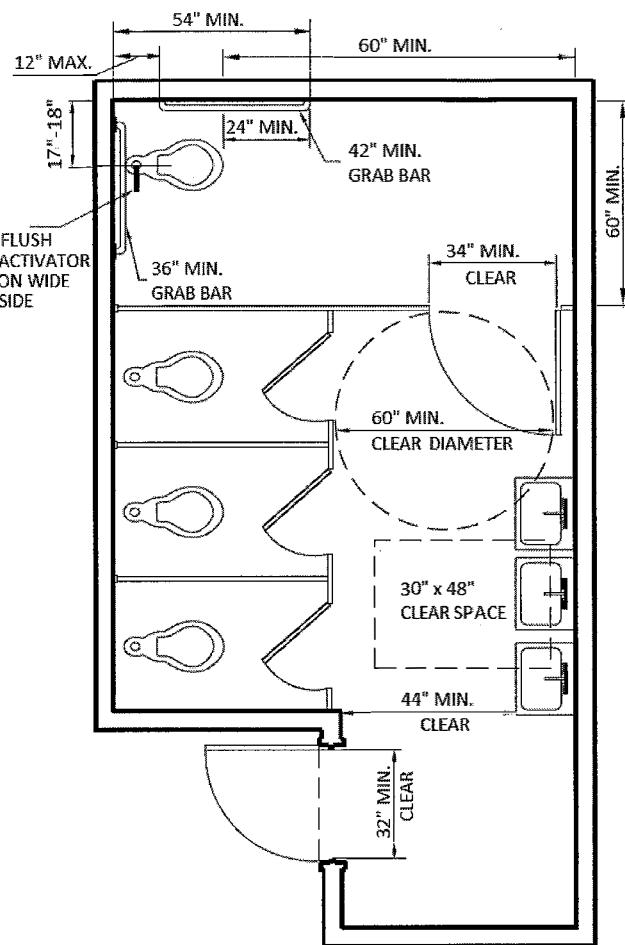
*(Platform required for final inspection)*



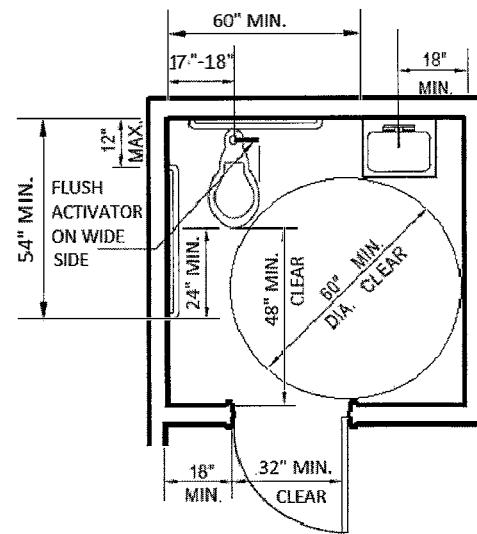
**FIGURE 11A-8J  
PLATFORM AT SECONDARY EXTERIOR DOOR**



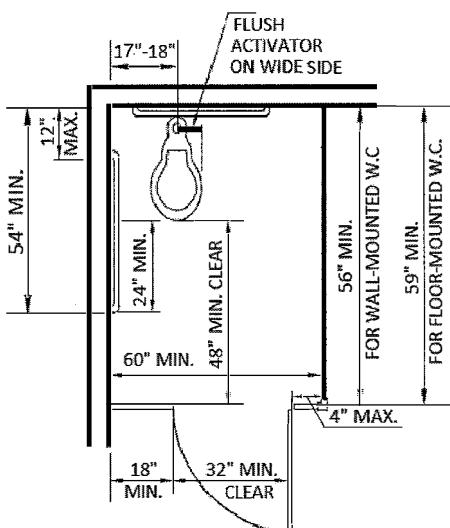
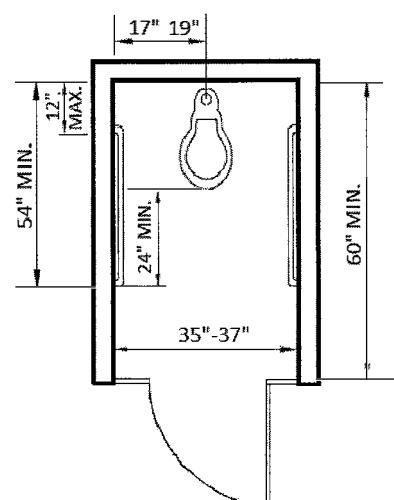
**FIGURE 11A-8K  
RAMP AT SECONDARY EXTERIOR DOOR**



(a) MULTIPLE-ACCOMMODATION TOILET FACILITY

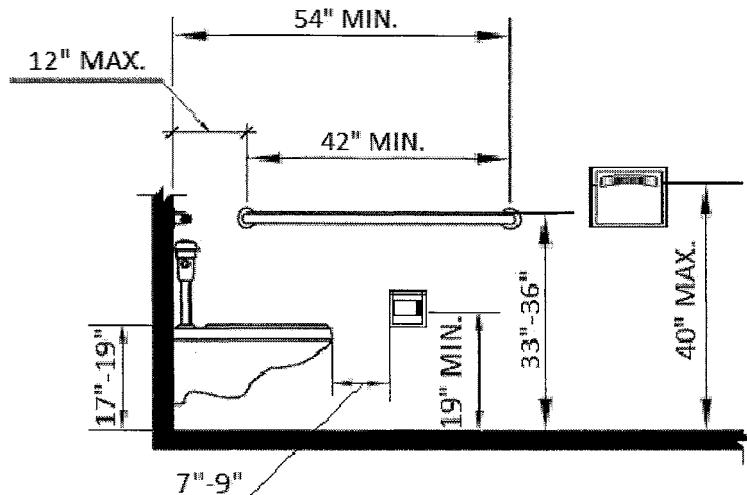


(b) SINGLE-ACCOMMODATION TOILET FACILITY

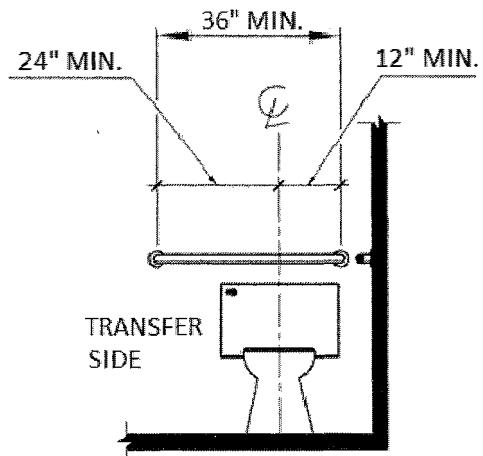
(c) ACCESSIBLE WATER CLOSET COMPARTMENT  
WITHIN MULTIPLE-ACCOMMODATION TOILET FACILITY

(d) AMBULATORY ACCESSIBLE COMPARTMENT

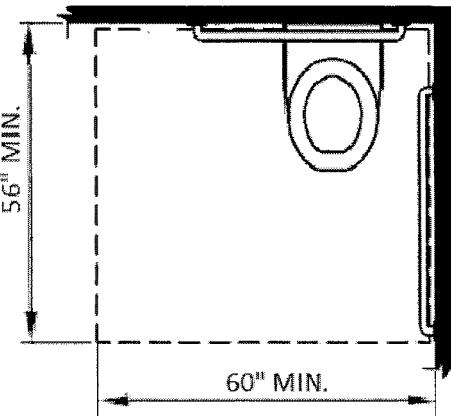
FIGURE 11A-9A  
TOILET FACILITIES



(a) SIDE VIEW

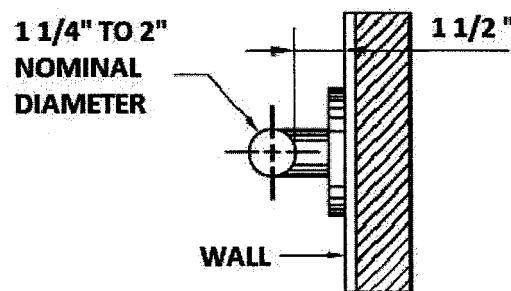


(b) FRONT VIEW

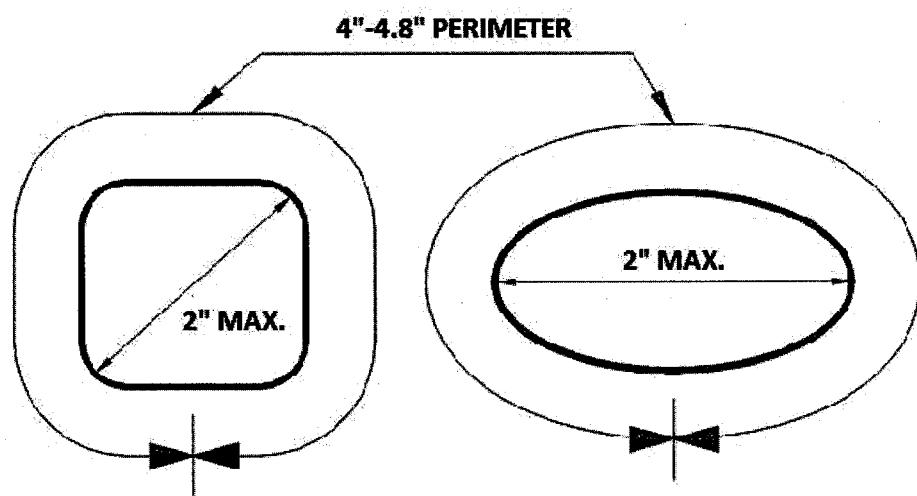


(c) CLEAR FLOOR SPACE AT WATER CLOSETS

FIGURE 11A-9B  
WATER CLOSETS



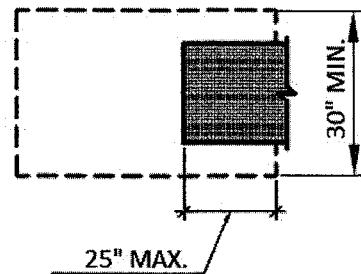
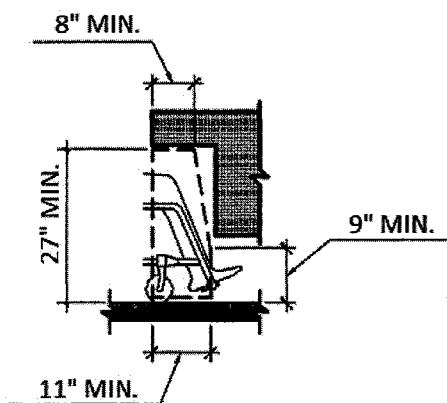
(a) SECTION THROUGH TYPICAL CIRCULAR GRAB BAR



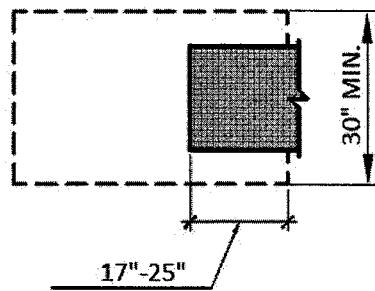
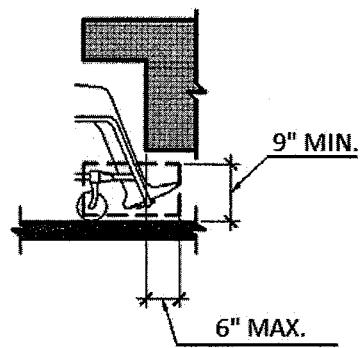
(b) NON-CIRCULAR CROSS SECTIONS

FIGURE 11A-9C  
GRAB BARS

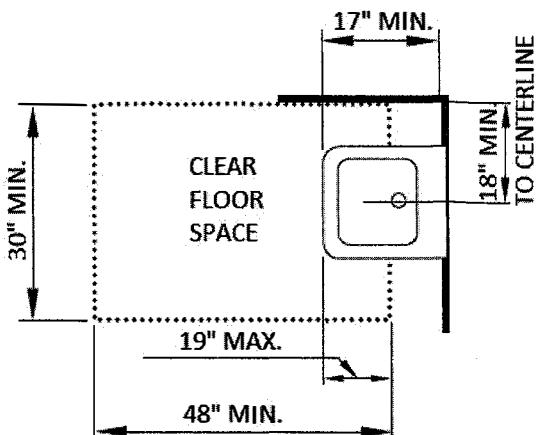
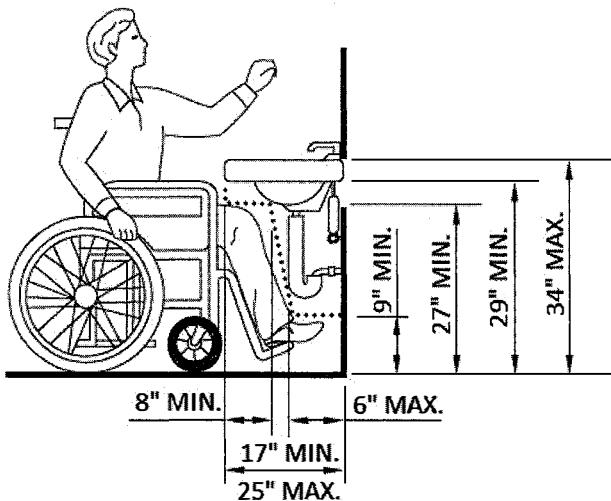
## HOUSING ACCESSIBILITY



**(a) KNEE SPACE - GENERAL REQUIREMENT**

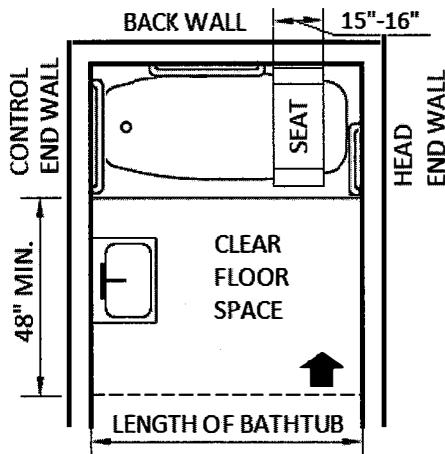


**(b) TOE SPACE - GENERAL REQUIREMENT**

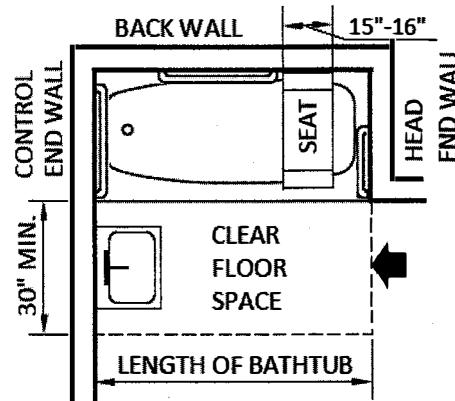


**(c) KNEE AND TOE SPACE FOR LAVATORIES**

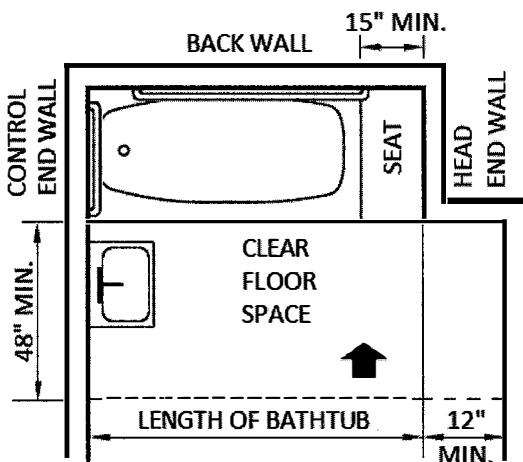
**FIGURE 11A-9D  
KNEE AND TOE SPACE**



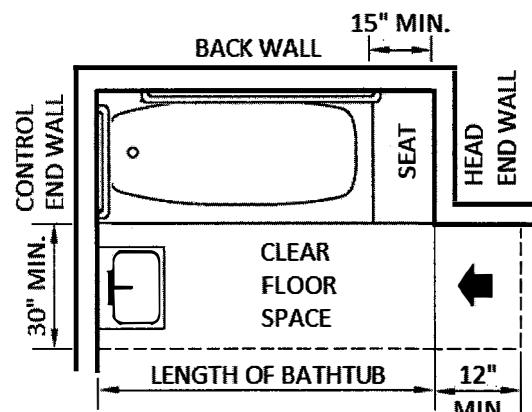
(a) REMOVABLE SEAT IN TUB - FRONT APPROACH



(b) REMOVABLE SEAT IN TUB - SIDE APPROACH



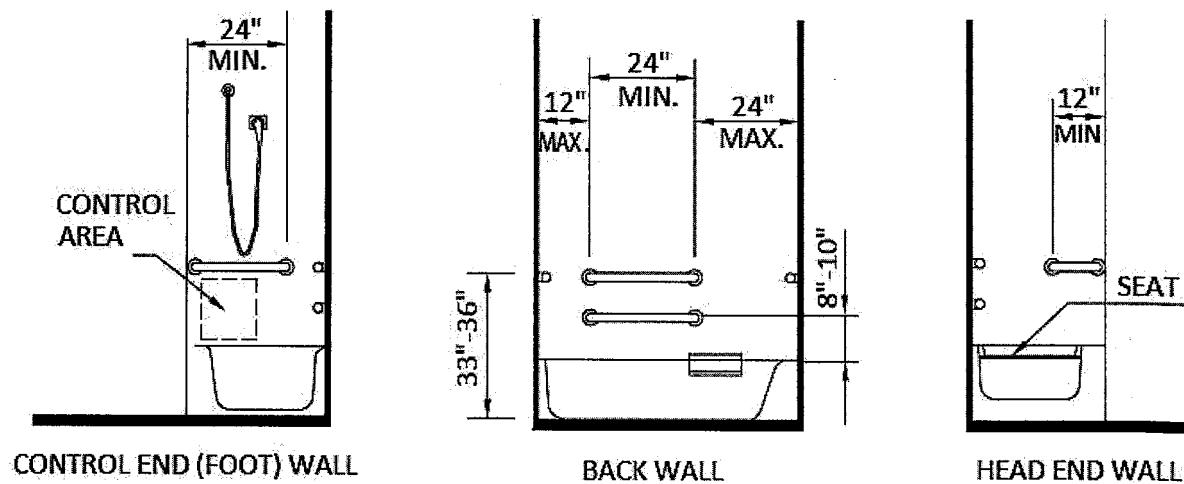
(c) PERMANENT SEAT IN TUB - FRONT APPROACH



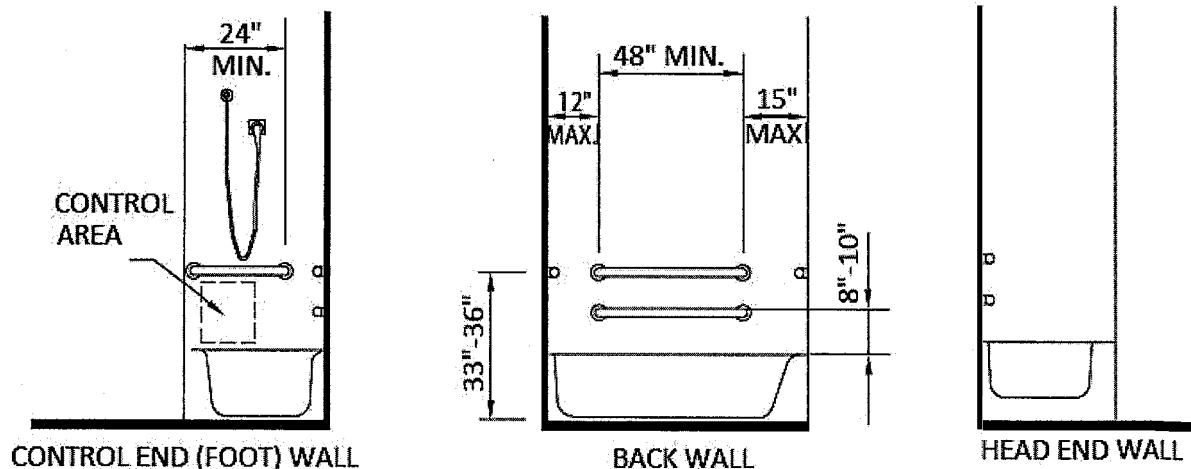
(d) PERMANENT SEAT IN TUB - SIDE APPROACH

**NOTE:** SEE FIGURE 11A-9F FOR SIZE OF GRAB BARS

**FIGURE 11A-9E**  
CLEAR FLOOR SPACE AT BATHTUBS

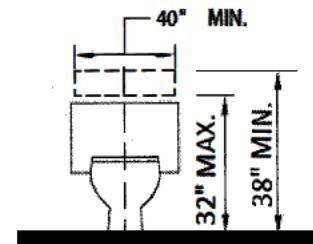
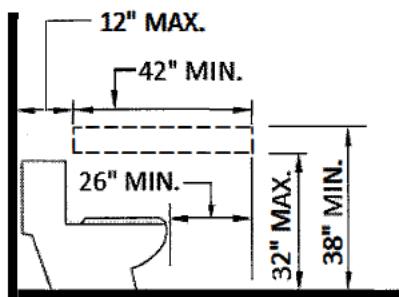


(a) WITH REMOVABLE SEAT IN TUB

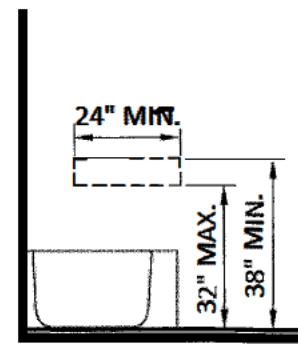
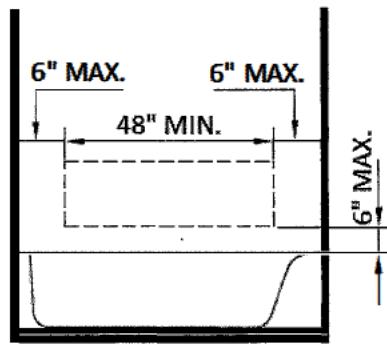
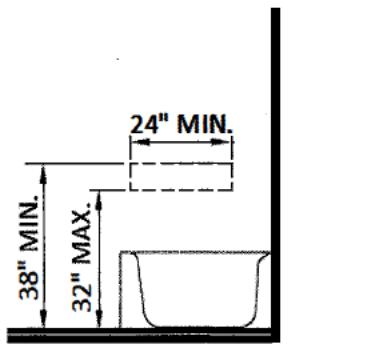


(b) WITH PERMANENT SEAT AT HEAD OF TUB

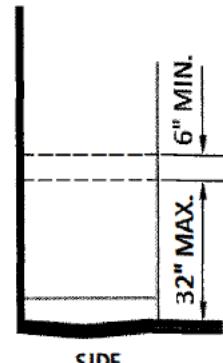
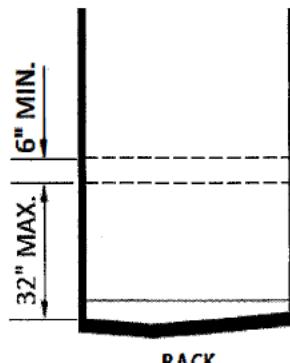
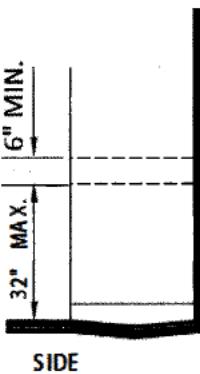
FIGURE 11A-9F  
GRAB BARS AT BATHTUBS



(a) GRAB BAR REINFORCEMENT FOR ADAPTABLE WATER CLOSETS



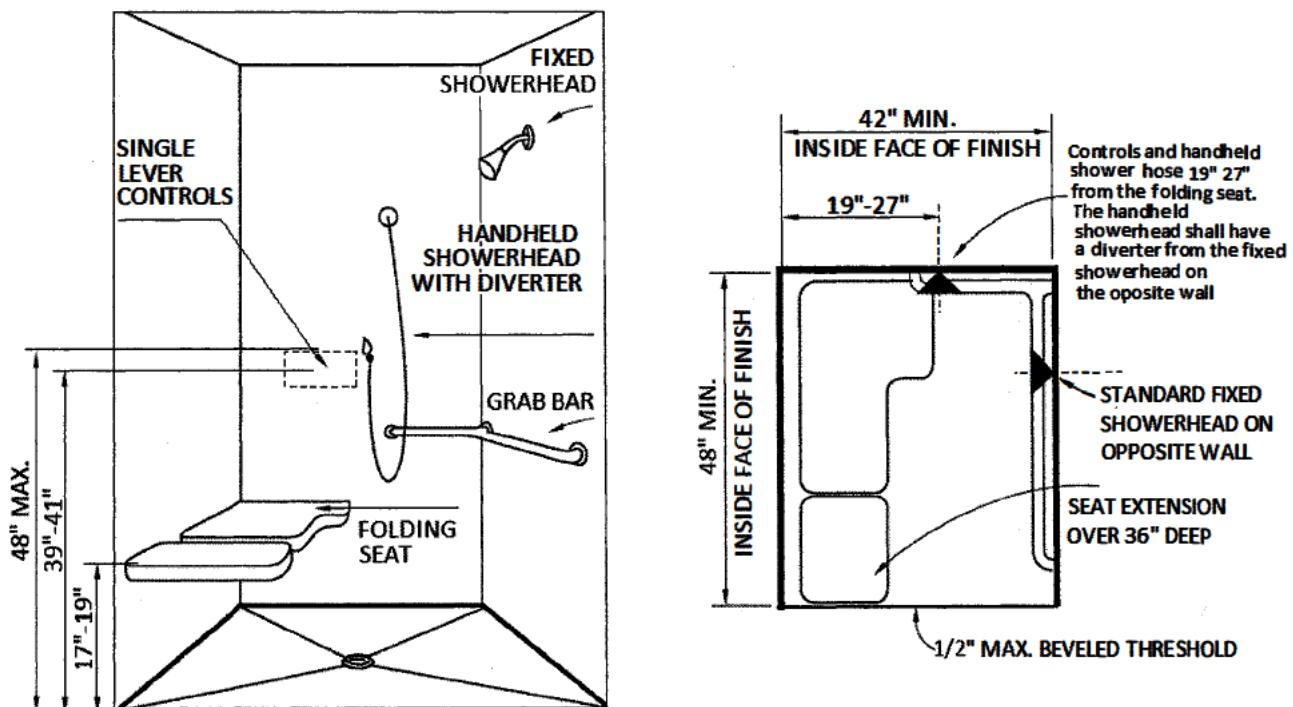
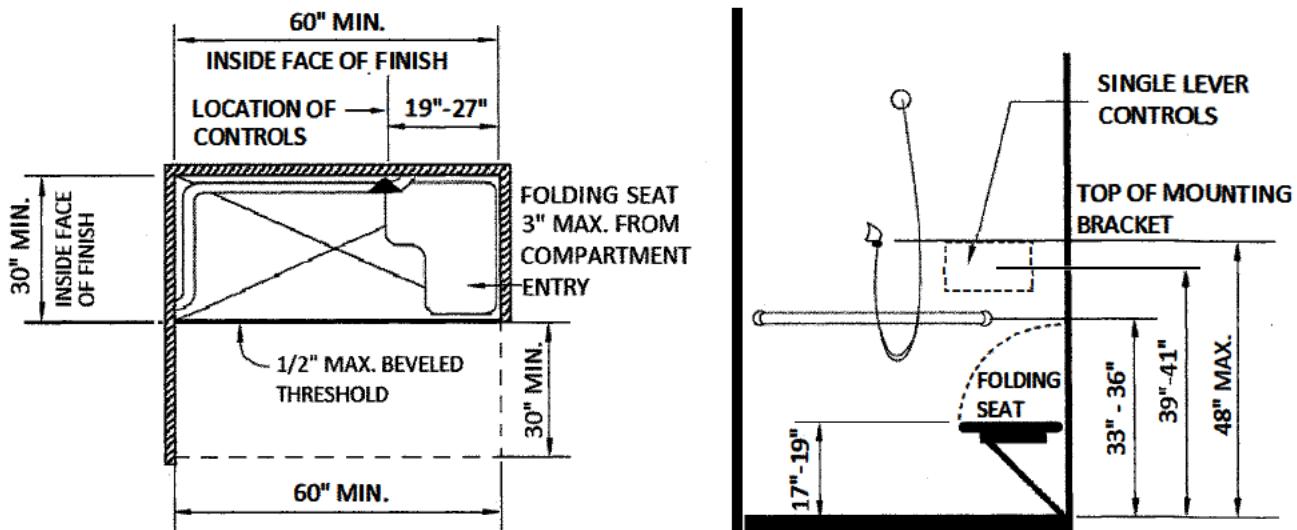
(b) GRAB BAR REINFORCEMENT FOR ADAPTABLE BATHTUBS



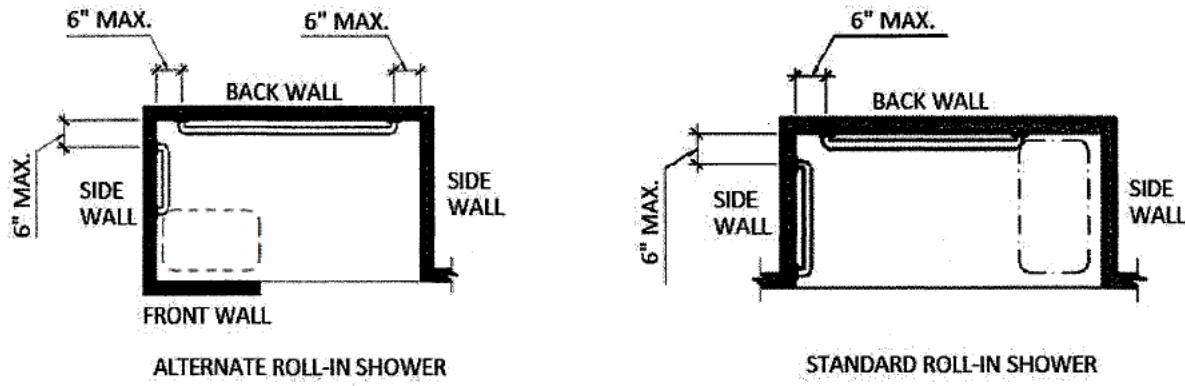
(c) GRAB BAR REINFORCEMENT FOR ADAPTABLE SHOWERS

AREAS OUTLINED IN DASHED LINES REPRESENT LOCATION FOR FUTURE INSTALLATION OF GRAB BARS

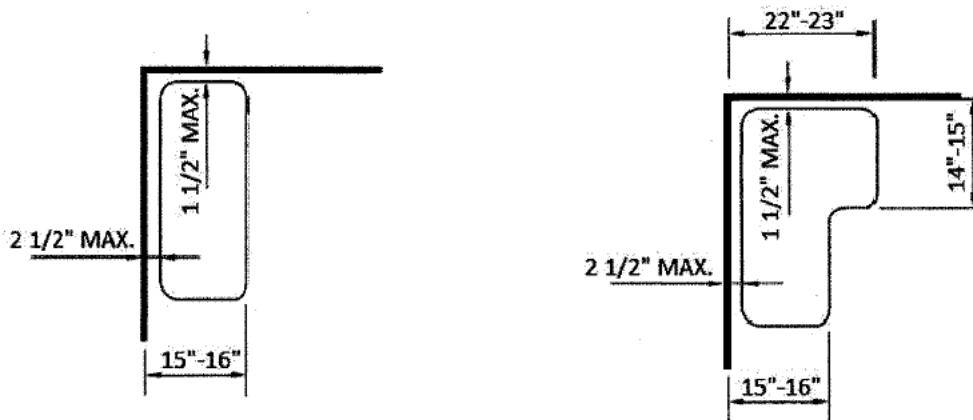
FIGURE 11A-9G  
REINFORCEMENT FOR GRAB BARS



**FIGURE 11A-9H  
STANDARD ROLL-IN SHOWER**

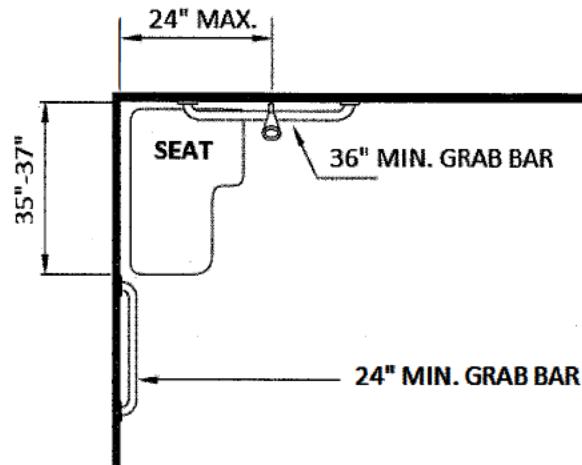


(a) GRAB BARS

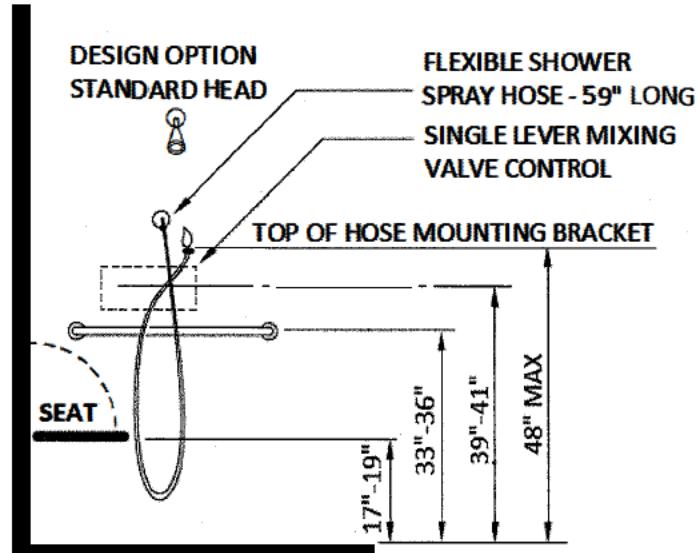


(b) SHOWER SEATS

FIGURE 1A-9I  
SHOWER SEATS AND GRAB BARS



(a) PLAN VIEW



(b) ELEVATION

FIGURE 11A-8J  
OPEN SHOWER

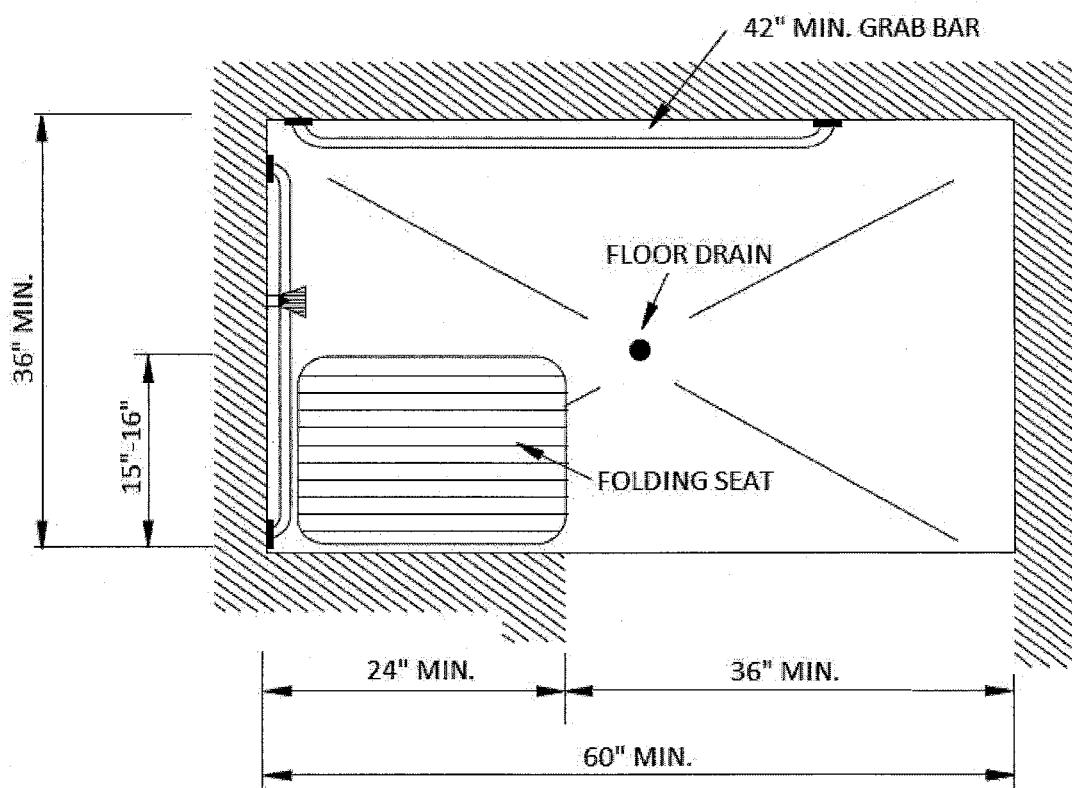


FIGURE 11A-9K  
ALTERNATE ROLL-IN SHOWER

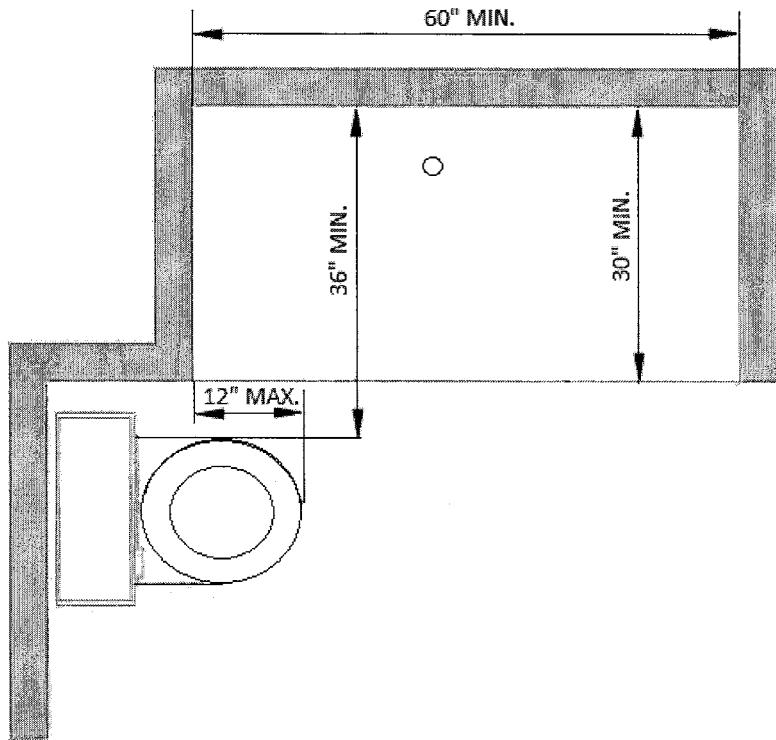


FIGURE 11A-9L  
SHOWER WITH WATER CLOSET

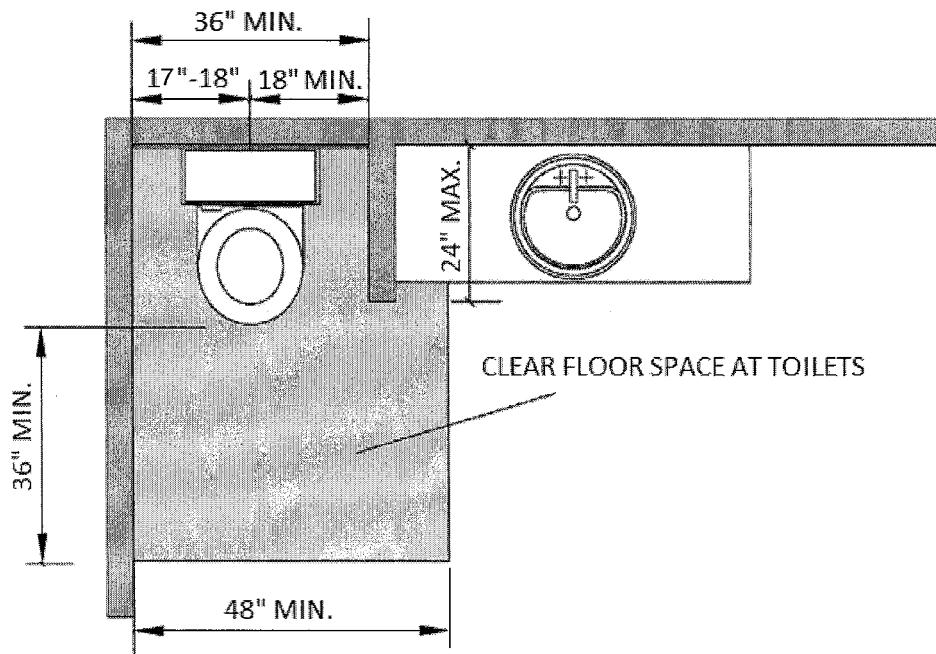
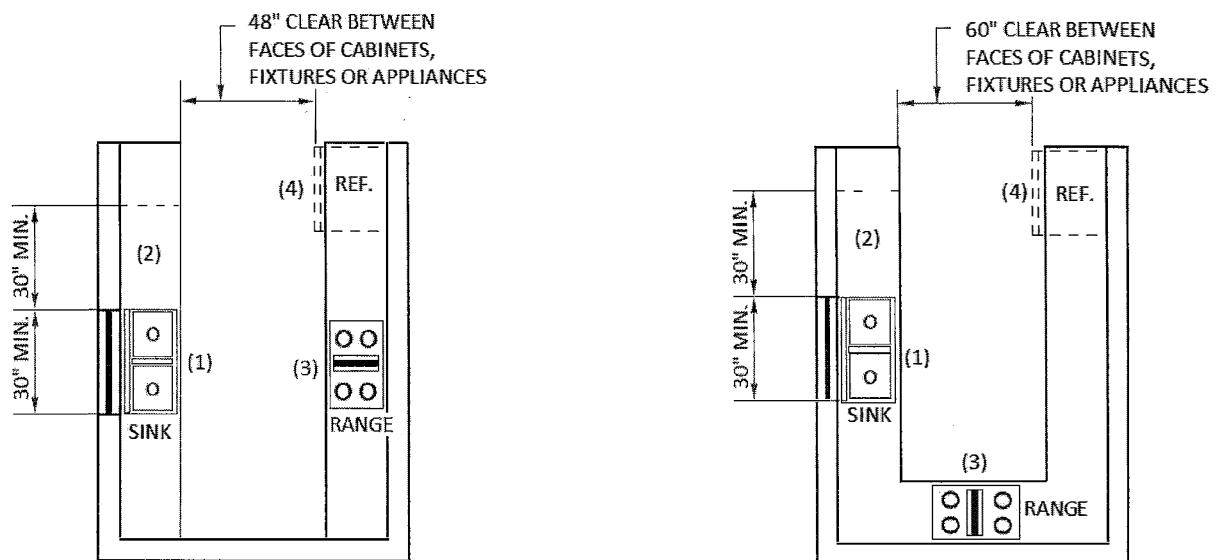
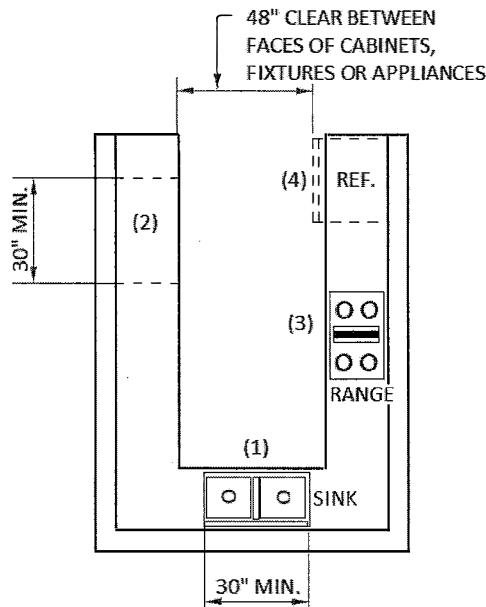


FIGURE 11A-9M  
WING WALL OR CABINET AT WATER CLOSET



(a) TYPICAL KITCHEN

(b) "U" SHAPED KITCHEN WITH RANGE AT THE BASE



(c) "U" SHAPED KITCHEN WITH SINK AT THE BASE

(1) 30" minimum countertop space for sink installation with removable base cabinet and finish flooring beneath the sink; 30" x 48" minimum clear floor space to allow parallel or forward approach.

(2) 30" minimum countertop for work surface with removable base cabinet and finish flooring beneath; 30" x 48" minimum clear floor space to allow parallel or forward approach.

(3) 30" x 48" minimum clear floor space adjacent to range to allow parallel approach.

(4) 30" x 48" clear floor space at refrigerator, dishwasher, trash compactor or other appliances to allow parallel or forward approach.

**FIGURE 11A-10A  
KITCHEN SPECIFICATIONS**

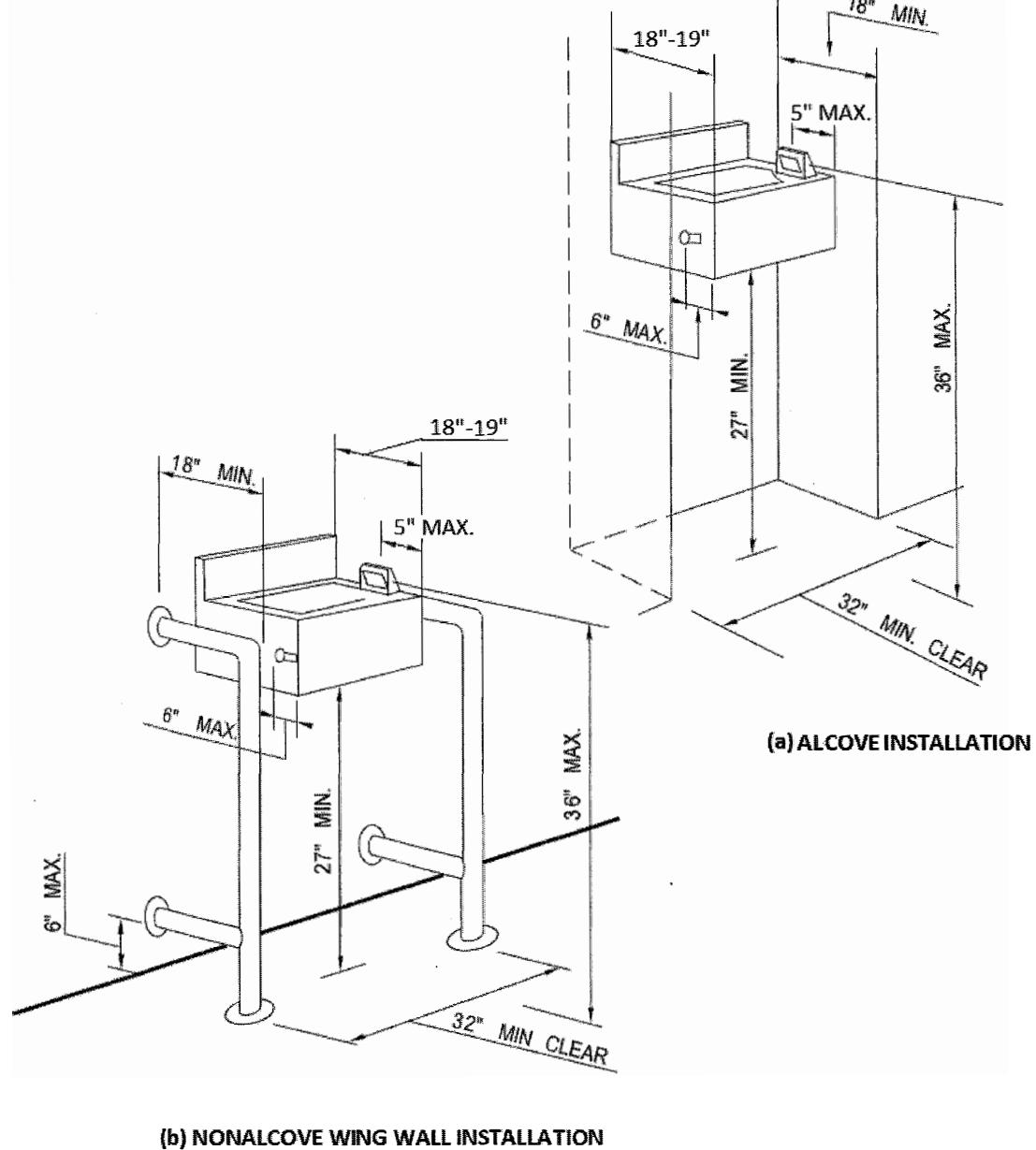
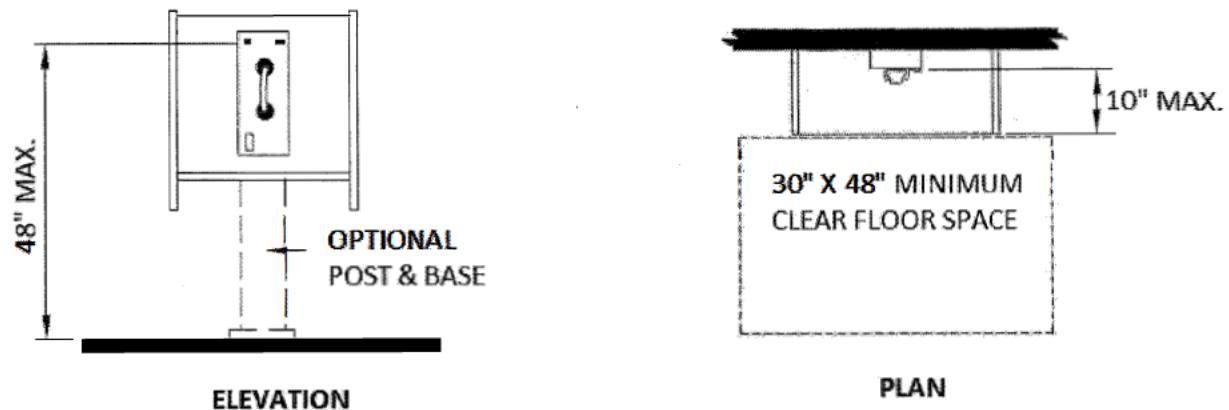
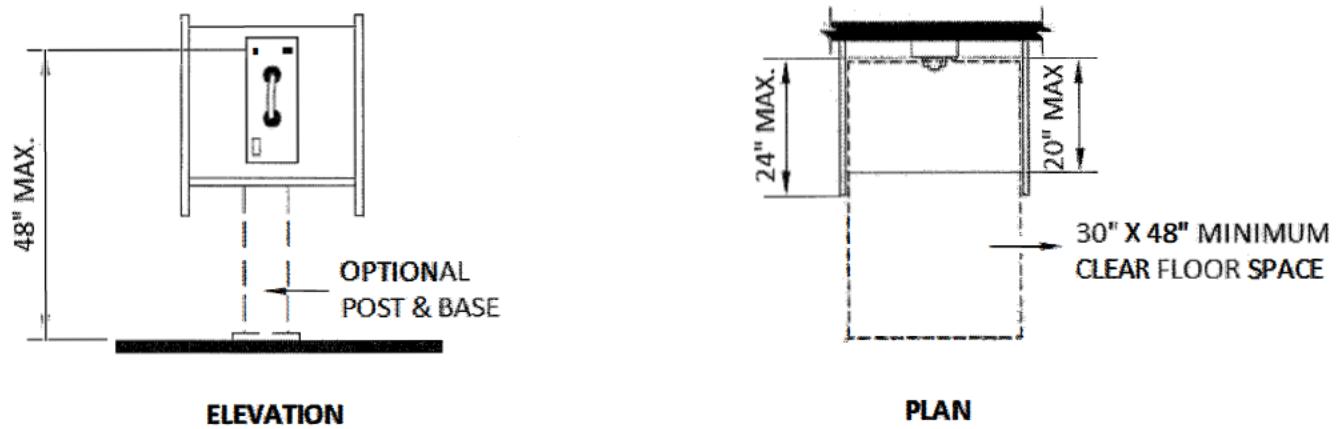


FIGURE 11A-11A  
DRINKING FOUNTAINS

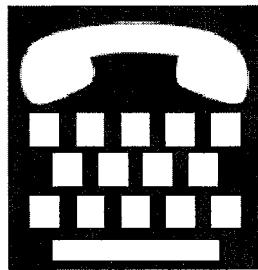


(a) PARALLEL APPROACH

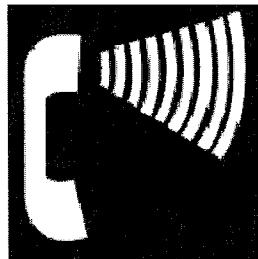


(b) FORWARD APPROACH

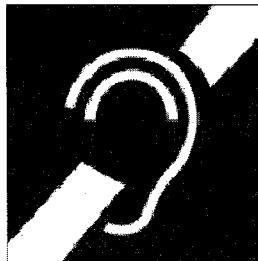
FIGURE 11A-11B  
TELEPHONES



**FIGURE 11A-11C  
INTERNATIONAL TTY SYMBOL**



**FIGURE 11A-11D  
VOLUME CONTROL TELEPHONES**



**FIGURE 11A-11E  
INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS**

**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 11B – ACCESSIBILITY TO PUBLIC BUILDINGS, PUBLIC ACCOMMODATIONS,**  
**COMMERCIAL BUILDINGS AND PUBLICLY FUNDED HOUSING**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.)

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
<i>Adopt entire chapter</i>					X															
<i>Adopt entire chapter as amended (amended sections listed below)</i>																				
<i>Adopt only those sections that are listed below</i>																				
<i>Chapter / Section</i>																				



## CHAPTER 11B

# ACCESSIBILITY TO PUBLIC BUILDINGS, PUBLIC ACCOMMODATIONS, COMMERCIAL BUILDINGS AND PUBLIC HOUSING

## DIVISION 1: APPLICATION AND ADMINISTRATION

### 11B-101 Purpose

**11B-101.1 General.** This *chapter* contains scoping and technical requirements for accessibility to sites, facilities, buildings, and elements by individuals with disabilities. The requirements are to be applied during the design, construction, additions to, and alteration of sites, facilities, buildings, and elements to the extent required by *Chapter 1, Section 1.9*.

### 11B-101.2 Reserved.

**11B-102 Dimensions for adults and children.** The technical requirements are based on adult dimensions and anthropometrics. In addition, this *chapter* includes technical requirements based on children's dimensions and anthropometrics for drinking fountains, water closets, toilet compartments, lavatories and sinks, dining surfaces, and work surfaces.

**11B-103 Equivalent facilitation.** Nothing in these requirements prevents the use of designs, products, or technologies as alternatives to those prescribed, provided they result in substantially equivalent or greater accessibility and usability.

### 11B-104 Conventions

**11B-104.1 Dimensions.** Dimensions that are not stated as "maximum" or "minimum" are absolute.

**11B-104.1.1 Construction and manufacturing tolerances.** All dimensions are subject to conventional industry tolerances except where the requirement is stated as a range with specific minimum and maximum end points.

**11B-104.2 Calculation of percentages.** Where the required number of elements or facilities to be provided is determined by calculations of ratios or percentages and remainders or fractions result, the next greater whole number of such elements or facilities shall be provided. Where the determination of the required size or dimension of an element or facility involves ratios or percentages, rounding down for values less than one half shall be permitted.

**11B-104.3 Figures.** Unless specifically stated otherwise, figures are provided for informational purposes only.

### 11B-105 Referenced standards.

**11B-105.1 General.** See *Chapter 35*.

### 11B-106 Definitions

**11B-106.1 General.** For the purpose of this *chapter*, the terms listed in Section 11B-106.5 and defined in Chapter 2 have the indicated meaning.

**11B-106.2 Terms defined in referenced standards.** Terms not listed in Section 11B-106.5 and not defined in Chapter 2, Section 202, but specifically defined in a referenced standard, shall have the specified meaning from the referenced standard unless otherwise stated.

**11B-106.3 Undefined terms.** The meaning of terms not specifically listed in Section 11B-106.5, and not defined in Chapter 2, Section 202, or in referenced standards shall be as defined by collegiate dictionaries in the sense that the context implies.

**11B-106.4 Interchangeability.** See *Chapter 2, Section 201.2*.

Convention	Description
36 914	dimension showing English units (in inches unless otherwise specified) above the line and SI units (in millimeters unless otherwise specified) below the line
6 152	dimension for small measurements
33-36 838-914	dimension showing a range with minimum maximum
min	minimum
max	maximum
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
-----	boundary of clear floorspace or maneuvering clearance
○	centerline
— — — —	a permitted element or its extent on
→	direction of travel or approach
— — — — →	a wall, floor, ceiling or other element cut in section or plan
■ ■ ■ ■	a highlighted element in elevation or plan
▨ ▨ ▨ ▨	location zone of element, control or feature

FIGURE 11B-104  
GRAPHIC CONVENTION FOR FIGURES

**11B-106.5 Defined terms.** *The following terms are defined in Chapter 2, Section 202.*

<b>ACCESS AISLE</b>	<b>CROSS SLOPE</b>
<b>ACCESSIBILITY</b>	<b>CURB CUT</b>
<b>ACCESSIBLE</b>	<b>CURB RAMP</b>
<b>ACCESSIBLE ELEMENT</b>	<b>DETECTABLE WARNING</b>
<b>ACCESSIBLE MEANS OF EGRESS</b>	<b>DIRECTIONAL SIGN</b>
<b>ACCESSIBLE ROUTE</b>	<b>DISABILITY</b>
<b>ACCESSIBLE SPACE</b>	<b>DORMITORY</b>
<b>ADAPTABLE</b>	<b>ELEMENT</b>
<b>ADDITION</b>	<b>ELEVATED PLAY COMPONENT</b>
<b>ADMINISTRATIVE AUTHORITY</b>	<b>ELEVATOR, PASSENGER</b>
<b>AISLE</b>	<b>EMPLOYEE WORK AREA</b>
<b>ALTERATION</b>	<b>ENFORCING AGENCY</b>
<b>AMUSEMENT ATTRACTION</b>	<b>ENTRANCE</b>
<b>AMUSEMENT RIDE</b>	<b>EQUIVALENT FACILITATION</b>
<b>AMUSEMENT RIDE SEAT</b>	<b>EXISTING BUILDING OR FACILITY</b>
<b>ANSI</b>	<b>EXIT</b>
<b>APPROVED</b>	<b>FACILITY</b>
<b>APPROVED TESTING AGENCY</b>	<b>FUNCTIONAL AREA</b>
<b>AREA OF REFUGE</b>	<b>GANGWAY</b>
<b>AREA OF SPORT ACTIVITY</b>	<b>GOLF CAR PASSAGE</b>
<b>ASSEMBLY AREA</b>	<b>GRAB BAR</b>
<b>ASSISTIVE LISTENING SYSTEM (ALS)</b>	<b>GRADE (ADJACENT GROUND ELEVATION)</b>
<b>AUTOMATIC DOOR</b>	<b>GRADE BREAK</b>
<b>AUTOMATIC TELLER MACHINE (ATM)</b>	<b>GROUND FLOOR</b>
<b>BATHROOM</b>	<b>GROUND LEVEL PLAY COMPONENT</b>
<b>BLENDED TRANSITION</b>	<b>GUARD</b>
<b>BOARDING PIER</b>	<b>HANDRAIL</b>
<b>BOAT LAUNCH RAMP</b>	<b>HEALTH CARE PROVIDER</b>
<b>BOAT SLIP</b>	<b>HISTORICAL BUILDINGS</b>
<b>BUILDING</b>	<b>HOUSING AT A PLACE OF EDUCATION</b>
<b>BUILDING OFFICIAL</b>	<b>IF, IF . . . THEN</b>
<b>CATCH POOL</b>	<b>INTERNATIONAL SYMBOL OF ACCESSIBILITY</b>
<b>CCR</b>	<b>KEY STATION</b>
<b>CHARACTERS</b>	<b>KICK PLATE</b>
<b>CHILDREN'S USE</b>	<b>KITCHEN OR KITCHENETTE</b>
<b>CIRCULATION PATH</b>	<b>LAVATORY</b>
<b>CLEAR</b>	<b>MAIL BOXES</b>
<b>CLEAR FLOOR SPACE</b>	<b>MARKED CROSSING</b>
<b>CLOSED-CIRCUIT TELEPHONE</b>	<b>MAY</b>
<b>COMMERCIAL FACILITIES</b>	<b>MEZZANINE</b>
<b>COMMON USE</b>	<b>NFPA</b>
<b>COMPLY WITH</b>	<b>NOSING</b>
	<b>OCCUPANT LOAD</b>
	<b>OCCUPIABLE SPACE</b>

<b>OPEN RISER</b>	<b>SIDEWALK</b>
<b>OPERABLE PART</b>	<b>SIGNAGE</b>
<b>PASSENGER ELEVATOR</b>	<b>SINK</b>
<b>PATH OF TRAVEL</b>	<b>SITE</b>
<b>PEDESTRIAN</b>	<b>SLEEPING ACCOMMODATIONS</b>
<b>PEDESTRIAN WAY</b>	<b>SOFT CONTAINED PLAY STRUCTURE</b>
<b>PERMANENT</b>	<b>SPACE</b>
<b>PERMIT</b>	<b>SPECIFIED PUBLIC TRANSPORTATION</b>
<b>PICTOGRAM</b>	<b>STAGE</b>
<b>PLACE OF PUBLIC ACCOMMODATION</b>	<b>STAIR</b>
<b>PLATFORM</b>	<b>STAIRWAY</b>
<b>PLATFORM (WHEELCHAIR) LIFT</b>	<b>STORY</b>
<b>PLAY AREA</b>	<b>STRUCTURAL FRAME</b>
<b>PLAY COMPONENT</b>	<b>STRUCTURE</b>
<b>POINT-OF-SALE DEVICE</b>	<b>TACTILE</b>
<b>POWDER ROOM</b>	<b>TACTILE SIGN</b>
<b>POWER-ASSISTED DOOR</b>	<b>TECHNICALLY INFEASIBLE</b>
<b>PRIVATE BUILDING OR FACILITY</b>	<b>TEEING GROUND</b>
<b>PROFESSIONAL OFFICE OF A HEALTH CARE PROVIDER</b>	<b>TEMPORARY</b>
<b>PUBLIC BUILDING OR FACILITY</b>	<b>TEXT TELEPHONE</b>
<b>PUBLIC ENTITY</b>	<b>TRANSFER DEVICE</b>
<b>PUBLIC ENTRANCE</b>	<b>TRANSIENT LODGING</b>
<b>PUBLIC HOUSING</b>	<b>TRANSIT BOARDING PLATFORM</b>
<b>PUBLIC USE</b>	<b>TRANSITION PLATE</b>
<b>PUBLIC-USE AREAS</b>	<b>TREAD</b>
<b>PUBLIC WAY</b>	<b>TTY</b>
<b>QUALIFIED HISTORIC BUILDING OR FACILITY</b>	<b>UNREASONABLE HARSHSHIP</b>
<b>RAMP</b>	<b>USE ZONE</b>
<b>REASONABLE PORTION</b>	<b>VALUATION THRESHOLD</b>
<b>RECOMMEND</b>	<b>VEHICULAR WAY</b>
<b>REMODELING</b>	<b>WALK</b>
<b>REPAIR</b>	<b>WET BAR</b>
<b>RESIDENTIAL DWELLING UNIT</b>	<b>WHEELCHAIR</b>
<b>RESTRICTED ENTRANCE</b>	<b>WHEELCHAIR SPACE</b>
<b>RISER</b>	<b>WORKSTATION</b>
<b>RUNNING SLOPE</b>	<b>WORK AREA EQUIPMENT</b>
<b>SELF-SERVICE STORAGE</b>	<b>11B-107 Special conditions appeals action. See Chapter 1, Section 1.9.1.5.</b>
<b>SERVICE ENTRANCE</b>	<b>11B-108 Maintenance of accessible features. A public accommodation shall maintain in operable working condition those features of facilities and equipment that are required to be accessible to and useable by persons with disabilities. Isolated or temporary interruptions in service or accessibility due to maintenance or repairs shall be permitted.</b>
<b>SHALL</b>	
<b>SHOPPING CENTER (OR SHOPPING MALL)</b>	
<b>SHOULD</b>	

## **DIVISION 2:** **SCOPING REQUIREMENTS**

### **11B-201 Application**

**11B-201.1 Scope.** All areas of newly designed and newly constructed buildings and facilities and altered portions of existing buildings and facilities shall comply with these requirements.

**11B-201.2 Application based on building or facility use.** Where a site, building, facility, room, or space contains more than one use, each portion shall comply with the applicable requirements for that use.

**11B-201.3 Temporary and permanent structures.** These requirements shall apply to temporary and permanent buildings and facilities.

**11B-201.4 Construction support facilities.** *These requirements shall apply to temporary or permanent construction support facilities for uses and activities not directly associated with the actual processes of construction, including but not limited to offices, meeting rooms, plan rooms, other administrative or support functions. When provided, toilet and bathing facilities serving construction support facilities shall comply with Section 11B-213. When toilet and bathing facilities serving construction support facilities are provided by portable units, at least one of each type shall be accessible and connected to the construction support facilities it serves by an accessible route.*

**Exception:** During construction an accessible route shall not be required between site arrival points or the boundary of the area of construction and the entrance to the construction support facilities if the only means of access between them is a vehicular way not providing pedestrian access.

### **11B-202 Existing buildings and facilities**

**11B-202.1 General.** Additions and alterations to existing buildings or facilities shall comply with Section 11B-202.

**11B-202.2 Additions.** Each addition to an existing building or facility shall comply with the requirements for new construction and shall comply with Section 11B-202.4.

**11B-202.3 Alterations.** Where existing elements or spaces are altered, each altered element or space shall comply with the applicable requirements of Division 2, including Section 11B-202.4.

#### **Exceptions:**

1. **Reserved.**
2. **Technically infeasible.** In alterations, where the enforcing authority determines compliance with applicable requirements is technically infeasible, the alteration shall provide equivalent facilitation or comply with the requirements to the maximum extent feasible. The details of the finding that full compliance with the requirements is technically infeasible shall be recorded and entered into the files of the enforcing agency.

3. Residential dwelling units not required to be accessible in compliance with *this code* shall not be required to comply with Section 11B-202.3.

**11B-202.3.1 Prohibited reduction in access.** An alteration that decreases or has the effect of decreasing the accessibility of a building or facility below the requirements for new construction at the time of the alteration is prohibited.

**11B-202.3.2 Extent of application.** An alteration of an existing element, space, or area of a building or facility shall not impose a requirement for accessibility greater than required for new construction.

**11B-202.3.3 Alteration of single elements.** *If alterations of single elements, when considered together, amount to an alteration of a room or space in a building or facility, the entire room or space shall be made accessible.*

**11B-202.4 Path of travel requirements in alterations, additions and structural repairs.** When alterations or additions are made to existing buildings or facilities, an accessible path of travel to the specific area of alteration or addition shall be provided. The primary accessible path of travel shall include:

1. A primary entrance to the building or facility,
2. Toilet and bathing facilities serving the area,
3. Drinking fountains serving the area,
4. Public telephones serving the area, and
5. Signs.

#### **Exceptions:**

1. Residential dwelling units shall comply with Section 11B-233.3.4.2.
2. If the following elements of a path of travel have been constructed or altered in compliance with the accessibility requirements of the immediately preceding edition of the California Building Code, it shall not be required to retrofit such elements to reflect the incremental changes in this code solely because of an alteration to an area served by those elements of the path of travel:
  1. A primary entrance to the building or facility,
  2. Toilet and bathing facilities serving the area,
  3. Drinking fountains serving the area,
  4. Public telephones serving the area, and
  5. Signs.
3. Additions or alterations to meet accessibility requirements consisting of one or more of the following items shall be limited to the actual scope of work of the project and shall not be required to comply with Section 11B-202.4:
  1. Altering one building entrance.
  2. Altering one existing toilet facility.

- 3. Altering existing elevators.
- 4. Altering existing steps.
- 5. Altering existing handrails.
- 4. Alterations solely for the purpose of barrier removal undertaken pursuant to the requirements of the Americans with Disabilities Act (Public Law 101-336, 28 C.F.R., Section 36.304) or the accessibility requirements of this code as those requirements or regulations now exist or are hereafter amended consisting of one or more of the following items shall be limited to the actual scope of work of the project and shall not be required to comply with Section 11B-202.4:
  - 1. Installing ramps.
  - 2. Making curb cuts in sidewalks and entrance.
  - 3. Repositioning shelves.
  - 4. Rearranging tables, chairs, vending machines, display racks, and other furniture.
  - 5. Repositioning telephones.
  - 6. Adding raised markings on elevator control buttons.
  - 7. Installing flashing alarm lights.
  - 8. Widening doors.
  - 9. Installing offset hinges to widen doorways.
  - 10. Eliminating a turnstile or providing an alternative accessible route.
  - 11. Installing accessible door hardware.
  - 12. Installing grab bars in toilet stalls.
  - 13. Rearranging toilet partitions to increase maneuvering space.
  - 14. Insulating lavatory pipes under sinks to prevent burns.
  - 15. Installing a raised toilet seat.
  - 16. Installing a full-length bathroom mirror.
  - 17. Repositioning the paper towel dispenser in a bathroom.
  - 18. Creating designated accessible parking spaces.
  - 19. Removing high-pile, low-density carpeting.
- 5. Alterations of existing parking lots by resurfacing and/or restriping shall be limited to the actual scope of work of the project and shall not be required to comply with Section 11B-202.4.
- 6. The addition or replacement of signs and/or identification devices shall be limited to the actual scope of work of the project and shall not be required to comply with Section 11B-202.4.
- 7. Projects consisting only of heating, ventilation, air conditioning, reroofing, electrical work not involving placement of switches and receptacles, cosmetic work that does not affect items regulated by this code, such

as painting, equipment not considered to be a part of the architecture of the building or area, such as computer terminals and office equipment shall not be required to comply with Section 11B-202.4 unless they affect the usability of the building or facility.

8. When the adjusted construction cost is less than or equal to the current valuation threshold, as defined in Chapter 2, Section 202, the cost of compliance with Section 11B-202.4 shall be limited to 20 percent of the adjusted construction cost of alterations, structural repairs or additions. When the cost of full compliance with Section 11B-202.4 would exceed 20 percent, compliance shall be provided to the greatest extent possible without exceeding 20 percent.

**\$143,303  
\$147,863**

When the adjusted construction cost exceeds the current valuation threshold, as defined in Chapter 2, Section 202, and the enforcing agency determines the cost of compliance with Section 11B-202.4 is an unreasonable hardship, as defined in Chapter 2, Section 202, full compliance with Section 11B-202.4 shall not be required. Compliance shall be provided by equivalent facilitation or to the greatest extent possible without creating an unreasonable hardship; but in no case shall the cost of compliance be less than 20 percent of the adjusted construction cost of alterations, structural repairs or additions. The details of the finding of unreasonable hardship shall be recorded and entered into the files of the enforcing agency and shall be subject to Chapter 1, Section 1.9.1.5, Special Conditions for Persons with Disabilities Requiring Appeals Action Ratification.

For the purposes of this exception, the adjusted construction cost of alterations, structural repairs or additions shall not include the cost of alterations to path of travel elements required to comply with Section 11B-202.4.

In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access in the following order:

- 1. An accessible entrance;
- 2. An accessible route to the altered area;
- 3. At least one accessible restroom for each sex or a single accessible unisex restroom;
- 4. Accessible telephones;
- 5. Accessible drinking fountains; and
- 6. When possible, additional accessible elements such as parking, signs, storage and alarms.

If an area has been altered without providing an accessible path of travel to that area, and subsequent alterations of that area or a different area on the same path of travel are undertaken within three years of the original alteration, the total cost of alterations to the areas on that path of travel during the preceding three-year period shall be considered in determining whether the cost of making that path of travel accessible is disproportionate.

9. Certain types of privately funded, multistory buildings and facilities were formerly exempt from accessibility requirements above and below the first floor under this code, but as of April 1, 1994 are no longer exempt due to more restrictive provisions in the federal Americans with Disabilities Act. In alteration projects involving buildings and facilities previously approved and built without elevators, areas above and below the ground floor are subject to the 20-percent disproportionately provisions described in Exception 8, above, even if the value of the project exceeds the valuation threshold in Exception 8. The types of buildings and facilities are:

1. Office buildings and passenger vehicle service stations of three stories or more and 3,000 or more square feet ( $279\text{ m}^2$ ) per floor.
2. Offices of physicians and surgeons.
3. Shopping centers.
4. Other buildings and facilities three stories or more and 3,000 or more square feet ( $279\text{ m}^2$ ) per floor if a reasonable portion of services sought and used by the public is available on the accessible level.

For the general privately funded multistory building exception applicable to new construction and alterations, see Section 11B-206.2.3, Exception 1.

The elevator exception set forth in this section does not obviate or limit in any way the obligation to comply with the other accessibility requirements in this code. For example, floors above or below the accessible ground floor must meet the requirements of this section except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then toilet or bathing facilities must be provided on the accessible ground floor.

**11B-202.5 Alterations to qualified historic buildings and facilities.** Alterations to a qualified historic building or facility shall comply with the State Historical Building Code, Part 8, Title 24, of the California Code of Regulations.

#### Exception: Reserved.

#### 11B-203 General exceptions

**11B-203.1 General.** Sites, buildings, facilities, and elements are exempt from these requirements to the extent specified by 11B-203.

**11B-203.2 Construction sites.** Structures and sites directly associated with the actual processes of construction, including but not limited to, scaffolding, bridging, materials hoists, materials storage and construction trailers shall not be required to comply with these requirements or to be on an accessible route. Portable toilet units provided for use exclusively by construction personnel on a construction site shall not be required to comply with Section 11B-213 or to be on an accessible route.

**11B-203.3 Raised areas.** Areas raised primarily for purposes of security, life safety, or fire safety, including but not limited to, observation or lookout galleries, prison guard towers, fire

towers or life guard stands shall not be required to comply with these requirements or to be on an accessible route.

**11B-203.4 Limited access spaces.** Spaces not customarily occupied and accessed only by ladders, catwalks, crawl spaces or very narrow passageways shall not be required to comply with these requirements or to be on an accessible route.

**11B-203.5 Machinery spaces.** Spaces frequented only by service personnel for maintenance, repair or occasional monitoring of equipment shall not be required to comply with these requirements or to be on an accessible route. Machinery spaces include, but are not limited to, elevator pits or elevator penthouses; mechanical, electrical or communications equipment rooms; piping or equipment catwalks; water or sewage treatment pump rooms and stations; electric substations and transformer vaults; and highway and tunnel utility facilities.

**11B-203.6 Single occupant structures.** Single occupant structures accessed only by passageways below grade or elevated above standard curb height, including but not limited to, toll booths that are accessed only by underground tunnels, shall not be required to comply with these requirements or to be on an accessible route.

**11B-203.7 Detention and correctional facilities.** In detention and correctional facilities, common use areas that are used only by inmates or detainees and security personnel and that do not serve holding cells or housing cells required to comply with Section 11B-232, shall not be required to comply with these requirements or to be on an accessible route.

**11B-203.8 Residential facilities.** In public housing residential facilities, common use areas that do not serve residential dwelling units required to provide mobility features complying with Sections 11B-809.2 through 11B-809.4 and adaptable features complying with Chapter 11A, Division IV shall not be required to comply with these requirements or to be on an accessible route.

**11B-203.9 Employee workstations.** Employee workstations shall be on an accessible route complying with Division 4. Spaces and elements within employee workstations shall only be required to comply with Sections 11B-207.1, 11B-215.3, 11B-302, 11B-303, and 11B-404.2.3. Common use circulation paths within employee workstations shall comply with Section 11B-206.2.8.

**11B-203.10 Raised refereeing, judging and scoring areas.** Raised structures used solely for refereeing, judging or scoring a sport shall not be required to comply with these requirements or to be on an accessible route. An accessible route complying with Division 4 shall be provided to the ground- or floor-level entry points, where provided, of stairs, ladders, or other means of reaching the raised elements or areas.

**11B-203.11 Water slides.** Water slides shall not be required to comply with these requirements or to be on an accessible route. An accessible route complying with Division 4 shall be provided to the ground- or floor-level entry points, where provided, of stairs, ladders or other means of reaching the raised elements or areas.

**11B-203.12 Animal containment areas.** Animal containment areas that are not for public use shall not be required to comply with these requirements or to be on an accessible

route. Animal containment areas for public use shall be on an accessible route.

**11B-203.13 Raised boxing or wrestling rings.** Raised boxing or wrestling rings shall not be required to comply with these requirements or to be on an accessible route. An accessible route complying with Division 4 shall be provided to the ground- or floor-level entry points, where provided, of stairs, ladders or other means of reaching the raised elements or areas.

**11B-203.14 Raised diving boards and diving platforms.** Raised diving boards and diving platforms shall not be required to comply with these requirements or to be on an accessible route. An accessible route complying with Division 4 shall be provided to the ground- or floor-level entry points, where provided, of stairs, ladders or other means of reaching the raised elements or areas.

#### **11B-204 Protruding objects**

**11B-204.1 General.** Protruding objects on circulation paths shall comply with Section 11B-307.

##### **Exceptions:**

1. Within areas of sport activity, protruding objects on circulation paths shall not be required to comply with Section 11B-307.
2. Within play areas, protruding objects on circulation paths shall not be required to comply with Section 11B-307 provided that ground level accessible routes provide vertical clearance in compliance with Section 11B-1008.2.

#### **11B-205 Operable parts**

**11B-205.1 General.** Operable parts on accessible elements, accessible routes, and in accessible rooms and spaces shall comply with Section 11B-309.

##### **Exceptions:**

1. Operable parts that are intended for use only by service or maintenance personnel shall not be required to comply with Section 11B-309.
2. Electrical or communication receptacles serving a dedicated use shall not be required to comply with Section 11B-309.
3. **Reserved.**
4. Floor electrical receptacles shall not be required to comply with Section 11B-309.
5. HVAC diffusers shall not be required to comply with Section 11B-309.
6. Except for light switches, where redundant controls are provided for a single element, one control in each space shall not be required to comply with Section 11B-309.
7. Cleats and other boat securement devices shall not be required to comply with Section 11B-309.3.
8. Exercise machines and exercise equipment shall not be required to comply with Section 11B-309.

#### **11B-206 Accessible routes**

**11B-206.1 General.** Accessible routes shall be provided in accordance with Section 11B-206 and shall comply with Division 4.

**11B-206.2 Where required.** Accessible routes shall be provided where required by Section 11B-206.2.

**11B-206.2.1 Site arrival points.** At least one accessible route shall be provided within the site from accessible parking spaces and accessible passenger loading zones; public streets and sidewalks; and public transportation stops to the accessible building or facility entrance they serve. *Where more than one route is provided, all routes must be accessible.*

##### **Exceptions:**

1. **Reserved.**
2. An accessible route shall not be required between site arrival points and the building or facility entrance if the only means of access between them is a vehicular way not providing pedestrian access.
3. *General circulation paths shall be permitted when located in close proximity to an accessible route.*

**11B-206.2.2 Within a site.** At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.

**Exception:** An accessible route shall not be required between accessible buildings, accessible facilities, accessible elements, and accessible spaces if the only means of access between them is a vehicular way not providing pedestrian access.

**11B-206.2.3 Multi-story buildings and facilities.** At least one accessible route shall connect each story and mezzanine in multi-story buildings and facilities.

##### **Exceptions:**

1. *The following types of privately funded multi-story buildings do not require a ramp or elevator above and below the first floor:*
  - 1.1. *Multi-storied office buildings (other than the professional office of a health care provider) and passenger vehicle service stations less than three stories high or less than 3,000 square feet (279 m<sup>2</sup>) per story.*
  - 1.2. *Any other privately funded multi-storied building that is not a shopping center, shopping mall or the professional office of a health care provider, or a terminal, depot or other station used for specified public transportation, or an airport passenger terminal and that is less than three stories high or less than 3,000 square feet (279 m<sup>2</sup>) per story if a re-*

*sonable portion of all facilities and accommodations normally sought and used by the public in such a building are accessible to and usable by persons with disabilities.*

**2. Reserved.**

3. In detention and correctional facilities, an accessible route shall not be required to connect stories where cells with mobility features required to comply with *Section 11B-807.2*, all common use areas serving cells with mobility features required to comply with *Section 11B-807.2*, and all public use areas are on an accessible route.
4. In residential facilities, an accessible route shall not be required to connect stories where residential dwelling units with mobility features required to comply with *Sections 11B-809.2 through 11B-809.4, residential dwelling units with adaptable features complying with Chapter 11A, Division IV*, all common use areas serving residential dwelling units with mobility features required to comply with *Sections 11B-809.2 through 11B-809.4, all common use areas serving residential dwelling units with adaptable features complying with Chapter 11A, Division IV*, and public use areas serving residential dwelling units are on an accessible route.
5. Within multi-story transient lodging guest rooms with mobility features required to comply with *Section 11B-806.2*, an accessible route shall not be required to connect stories provided that spaces complying with *Section 11B-806.2* are on an accessible route and sleeping accommodations for two persons minimum are provided on a story served by an accessible route.
6. In air traffic control towers, an accessible route shall not be required to serve the cab and *the equipment areas on* the floor immediately below the cab.

**7. Reserved.**

**11B-206.2.3.1 Stairs and escalators in existing buildings.** In alterations and additions, where an escalator or stair is provided where none existed previously and major structural modifications are necessary for the installation, an accessible route shall be provided between the levels served by the escalator or stair unless exempted by *Section 11B-206.2.3 Exceptions 1 through 7*.

**11B-206.2.3.2 Distance to elevators.** In new construction of buildings where elevators are required by *Section 11B-206.2.3*, and which exceed 10,000 square feet ( $929 m^2$ ) on any floor, an accessible means of vertical access via ramp, elevator or lift shall be provided within 200 feet ( $60,960 mm$ ) of travel of each stair and each escalator. In existing buildings that exceed 10,000 square feet ( $929 m^2$ ) on any floor and in which elevators are required by *Section 11B-206.2.3*, whenever a

*newly constructed means of vertical access is provided via stairs or an escalator, an accessible means of vertical access via ramp, elevator or lift shall be provided within 200 feet ( $60,960 mm$ ) of travel of each new stair or escalator.*

*Exception:* Stairs used solely for emergency egress.

**11B-206.2.4 Spaces and elements.** At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility, *including mezzanines*, which are otherwise connected by a circulation path unless exempted by *Section 11B-206.2.3 Exceptions 1 through 7*.

**Exceptions:**

1. **Reserved.**
2. In assembly areas with fixed seating required to comply with *Section 11B-221*, an accessible route shall not be required to serve fixed seating where wheelchair spaces required to be on an accessible route are not provided.

**3. Reserved.**

**11B-206.2.5. Restaurants, cafeterias, banquet facilities and bars.** In restaurants, cafeterias, banquet facilities, bars, and similar facilities, an accessible route shall be provided to all functional areas, including raised or sunken areas, and outdoor areas.

**Exceptions:**

1. In *alterations of buildings or facilities not required to provide an accessible route between stories*, an accessible route shall not be required to a mezzanine dining area where the mezzanine contains less than 25 percent of the total combined area for seating and dining and where the same decor and services are provided in the accessible area.
2. **Reserved.**
3. In sports facilities, tiered dining areas providing seating required to comply with *Section 11B-221* shall be required to have accessible routes serving at least 25 percent of the dining area provided that accessible routes serve seating complying with *Section 11B-221* and each tier is provided with the same services.

**11B-206.2.6 Performance areas.** Where a circulation path directly connects a performance area to an assembly seating area, an accessible route shall directly connect the assembly seating area with the performance area. An accessible route shall be provided from performance areas to ancillary areas or facilities used by performers unless exempted by *Section 11B-206.2.3 Exceptions 1 through 7*.

**11B-206.2.7 Press boxes.** Press boxes in assembly areas shall be on an accessible route.

**Exceptions:**

1. An accessible route shall not be required to press boxes in bleachers that have points of entry at only

one level provided that the aggregate area of all press boxes is 500 square feet ( $46\text{ m}^2$ ) maximum.

2. An accessible route shall not be required to free-standing press boxes that are elevated above grade 12 feet (3660 mm) minimum provided that the aggregate area of all press boxes is 500 square feet ( $46\text{ m}^2$ ) maximum.

**11B-206.2.8 Employee work areas.** Common use circulation paths within employee work areas shall comply with *Section 11B-402*.

**Exceptions:**

1. *Reserved.*
2. Common use circulation paths located within employee work areas that are an integral component of work area equipment shall not be required to comply with *Section 11B-402*.
3. Common use circulation paths located within exterior employee work areas that are fully exposed to the weather shall not be required to comply with *Section 11B-402*.

**11B-206.2.9 Amusement rides.** Amusement rides required to comply with *Section 11B-234* shall provide accessible routes in accordance with *Section 11B-206.2.9*. Accessible routes serving amusement rides shall comply with *Division 4* except as modified by *Section 11B-1002.2*.

**11B-206.2.9.1 Load and unload areas.** Load and unload areas shall be on an accessible route. Where load and unload areas have more than one loading or unloading position, at least one loading and unloading position shall be on an accessible route.

**11B-206.2.9.2 Wheelchair spaces, ride seats designed for transfer, and transfer devices.** When amusement rides are in the load and unload position, wheelchair spaces complying with *Section 11B-1002.4*, amusement ride seats designed for transfer complying with *Section 11B-1002.5*, and transfer devices complying with *Section 11B-1002.6* shall be on an accessible route.

**11B-206.2.10 Recreational boating facilities.** Boat slips required to comply with *Section 11B-235.2* and boarding piers at boat launch ramps required to comply with *Section 11B-235.3* shall be on an accessible route. Accessible routes serving recreational boating facilities shall comply with *Division 4*, except as modified by *Section 11B-1003.2*.

**11B-206.2.11 Bowling lanes.** Where bowling lanes are provided, at least 5 percent, but no fewer than one of each type of bowling lane, shall be on an accessible route.

**11B-206.2.12 Court sports.** In court sports, at least one accessible route shall directly connect both sides of the court.

**11B-206.2.13 Exercise machines and equipment.** Exercise machines and equipment required to comply with *11B-236* shall be on an accessible route.

**11B-206.2.14 Fishing piers and platforms.** Fishing piers and platforms shall be on an accessible route. Accessible routes serving fishing piers and platforms shall comply with *Division 4* except as modified by *Section 11B-1005.1*.

**11B-206.2.15 Golf facilities.** At least one accessible route shall connect accessible elements and spaces within the boundary of the golf course. In addition, accessible routes serving golf car rental areas; bag drop areas; course weather shelters complying with *Section 11B-238.2.3*; course toilet rooms; and practice putting greens, practice teeing grounds, and teeing stations at driving ranges complying with *Section 11B-238.3* shall comply with *Division 4* except as modified by *Section 11B-1006.2*.

**Exception:** Golf car passages complying with *Section 11B-1006.3* shall be permitted to be used for all or part of accessible routes required by *Section 11B-206.2.15*.

**11B-206.2.16 Miniature golf facilities.** Holes required to comply with *Section 11B-239.2*, including the start of play, shall be on an accessible route. Accessible routes serving miniature golf facilities shall comply with *Division 4* except as modified by *Section 11B-1007.2*.

**11B-206.2.17 Play areas.** Play areas shall provide accessible routes in accordance with *Section 11B-206.2.17*. Accessible routes serving play areas shall comply with *Division 4* except as modified by *Section 11B-1008.2*.

**11B-206.2.17.1 Ground level and elevated play components.** At least one accessible route shall be provided within the play area. The accessible route shall connect ground level play components required to comply with *Section 11B-240.2.1* and elevated play components required to comply with *Section 11B-240.2.2*, including entry and exit points of the play components.

**11B-206.2.17.2 Soft contained play structures.** Where three or fewer entry points are provided for soft contained play structures, at least one entry point shall be on an accessible route. Where four or more entry points are provided for soft contained play structures, at least two entry points shall be on an accessible route.

**11B-206.2.18 Area of sport activity.** An accessible route shall be provided to the boundary of each area of sport activity.

**11B-206.3 Location.** Accessible routes shall coincide with or be located in the same area as general circulation paths. Where circulation paths are interior, required accessible routes shall also be interior. *An accessible route shall not pass through kitchens, storage rooms, restrooms, closets or other spaces used for similar purposes, except as permitted by Chapter 10.*

**11B-206.4 Entrances.** Entrances shall be provided in accordance with *Section 11B-206.4*. Entrance doors, doorways, and gates shall comply with *Section 11B-404* and shall be on an accessible route complying with *Section 11B-402*.

**Exceptions:**

1. *Reserved.*
2. *Reserved.*

**11B-206.4.1 Entrances and exterior ground floor exits.** All entrances and exterior ground-floor exits to buildings and facilities shall comply with Section 11B-404.

**Exceptions:**

1. *Exterior ground floor exits serving smoke-proof enclosures, stairwells, and exit doors serving stairs only shall not be required to comply with Section 11B-404.*
2. *Exits in excess of those required by Chapter 10, and which are more than 24 inches (610 mm) above grade shall not be required to comply with Section 11B-404. Directional signage shall comply with Chapter 10, Section 1007.10.*

**11B-206.4.2 Parking structure entrances.** Where direct access is provided for pedestrians from a parking structure to a building or facility entrance, each direct access to the building or facility entrance shall comply with Section 11B-404.

**11B-206.4.3 Entrances from tunnels or elevated walkways.** Where direct access is provided for pedestrians from a pedestrian tunnel or elevated walkway to a building or facility, all entrances to the building or facility from each tunnel or walkway shall comply with Section 11B-404.

**11B-206.4.4 Transportation facilities.** In addition to the requirements of Sections 11B-206.4.2, 11B-206.4.3, and 11B-206.4.5 through 11B-206.4.9, transportation facilities shall provide entrances in accordance with Section 11B-206.4.4.

**11B-206.4.4.1 Location.** In transportation facilities, where different entrances serve different transportation fixed routes or groups of fixed routes, entrances serving each fixed route or group of fixed routes shall comply with Section 11B-404.

**Exception:** Entrances to key stations and existing intercity rail stations retrofitted in accordance with 49 CFR 37.49 or 49 CFR 37.51 shall not be required to comply with Section 11B-206.4.4.1.

**11B-206.4.4.2 Direct connections.** Direct connections to other facilities shall provide an accessible route complying with Section 11B-404 from the point of connection to boarding platforms and all transportation system elements required to be accessible. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements required to be accessible.

**Exception:** In key stations and existing intercity rail stations, existing direct connections shall not be required to comply with Section 11B-404.

**11B-206.4.4.3 Key stations and intercity rail stations.** Key stations and existing intercity rail stations required by Subpart C of 49 CFR part 37 to be altered, shall have entrances complying with Section 11B-404.

**11B-206.4.5 Tenant spaces.** All entrances to each tenancy in a facility shall comply with Section 11B-404.

**Exception:** Self-service storage facilities not required to comply with Section 11B-225.3 shall not be required to be on an accessible route.

**11B-206.4.6 Residential dwelling unit primary entrance.** In residential dwelling units, at least one primary entrance

shall comply with Section 11B-404. The primary entrance to a residential dwelling unit shall not be to a bedroom.

**11B-206.4.7 Restricted entrances.** Where restricted entrances are provided to a building or facility, all restricted entrances to the building or facility shall comply with Section 11B-404.

**11B-206.4.8 Service entrances.** If a service entrance is the only entrance to a building or to a tenancy in a facility, that entrance shall comply with Section 11B-404. In existing buildings and facilities, a service entrance shall not be the sole accessible entrance unless it is the only entrance to a building or facility.

**11B-206.4.9 Entrances for inmates or detainees.** Where entrances used only by inmates or detainees and security personnel are provided at judicial facilities, detention facilities, or correctional facilities, at least one such entrance shall comply with Section 11B-404.

**11B-206.4.10 Medical care and long-term care facilities.** Weather protection by a canopy or roof overhang shall be provided at a minimum of one accessible entrance to licensed medical care and licensed long-term care facilities where the period of stay may exceed twenty-four hours. The area of weather protection shall include the passenger loading zone complying with Section 11B-209.3 and the accessible route from the passenger loading zone to the accessible entrance it serves.

**11B-206.5 Doors, doorways, and gates.** Doors, doorways and gates providing user passage shall be provided in accordance with Section 11B-206.5.

**11B-206.5.1 Entrances.** Each entrance to a building or facility required to comply with Section 11B-206.4 shall comply with Section 11B-404.

**11B-206.5.2 Rooms and spaces.** Within a building or facility, every door, doorway or gate serving rooms and spaces complying with this chapter shall comply with Section 11B-404.

**11B-206.5.3 Transient lodging facilities.** In transient lodging facilities, entrances, doors, and doorways providing user passage into and within guest rooms that are not required to provide mobility features complying with Section 11B-806.2 shall comply with Section 11B-404.2.3.

**Exception:** Shower and sauna doors in guest rooms that are not required to provide mobility features complying with Section 11B-806.2 shall not be required to comply with Section 11B-404.2.3.

**11B-206.5.4 Residential dwelling units.** In residential dwelling units required to provide mobility features complying with Sections 11B-809.2 through 11B-809.4, all doors and doorways providing user passage shall comply with Section 11B-404.

**11B-206.6 Elevators.** Elevators provided for passengers shall comply with Section 11B-407. Where multiple elevators are provided, each elevator shall comply with Section 11B-407.

**Exceptions:**

1. In a building or facility permitted to use the exceptions to Section 11B-206.2.3 or permitted by Section

*11B-206.7 to use a platform lift, elevators complying with Section 11B-408 shall be permitted.*

2. Elevators complying with Section 11B-408 or 11B-409 shall be permitted in multi-story residential dwelling units. *Elevators provided as a means of access within a private residence shall be installed so that they are not accessible to the general public or to other occupants of the building.*
3. *Destination-oriented elevators complying with Section 11B-411 shall be permitted.*

**11B-206.6.1 Existing elevators.** Where elements of existing elevators are altered, the same element shall also be altered in all elevators that are programmed to respond to the same hall call control as the altered elevator and shall comply with the requirements of Section 11B-407 for the altered element.

**Exception:** *Where a group of existing elevators are altered into a destination-oriented elevator system, or where elements of existing destination-oriented elevators are altered, the same elements shall also be altered in all elevators that are programmed to respond to the same call console or group of call consoles and shall comply with the requirements of Section 11B-411 for the altered elements.*

**11B-206.7 Platform lifts.** Platform lifts shall comply with Section 11B-410. Platform lifts shall be permitted as a component of an accessible route in new construction in accordance with Section 11B-206.7. Platform lifts shall be permitted as a component of an accessible route in an existing building or facility.

**11B-206.7.1 Performance areas and speakers' platforms.** Platform lifts shall be permitted to provide accessible routes to performance areas and speakers' platforms.

**11B-206.7.2 Wheelchair spaces.** Platform lifts shall be permitted to provide an accessible route to comply with the wheelchair space dispersion and line-of-sight requirements of Sections 11B-221 and 11B-802.

**11B-206.7.3 Incidental spaces.** Platform lifts shall be permitted to provide an accessible route to incidental spaces which are not public use spaces and which are occupied by five persons maximum.

**11B-206.7.4 Judicial spaces.** Platform lifts shall be permitted to provide an accessible route to: jury boxes and witness stands; raised courtroom stations including, judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations, and court reporters' stations; and to depressed areas such as the well of a court.

**11B-206.7.5 Existing site constraints.** Platform lifts shall be permitted where existing exterior site constraints make use of a ramp or elevator infeasible.

**11B-206.7.6 Guest rooms and residential dwelling units.** Platform lifts shall be permitted to connect levels within transient lodging guest rooms required to provide mobility features complying with Section 11B-806.2 or residential dwelling units required to provide mobility features complying with Sections 11B-809.2 through 11B-

809.4 and adaptable features complying with Chapter 11A, Division IV.

**11B-206.7.7 Amusement rides.** Platform lifts shall be permitted to provide accessible routes to load and unload areas serving amusement rides.

**11B-206.7.8 Play areas.** Platform lifts shall be permitted to provide accessible routes to play components or soft contained play structures.

**11B-206.7.9 Team or player seating.** Platform lifts shall be permitted to provide accessible routes to team or player seating areas serving areas of sport activity.

**11B-206.7.10 Recreational boating facilities and fishing piers and platforms.** Platform lifts shall be permitted to be used instead of gangways that are part of accessible routes serving recreational boating facilities and fishing piers and platforms.

**11B-206.8 Security barriers.** Security barriers, including but not limited to, security bollards and security check points, shall not obstruct a required accessible route or accessible means of egress.

**Exception:** Where security barriers incorporate elements that cannot comply with these requirements such as certain metal detectors, fluoroscopes, or other similar devices, the accessible route shall be permitted to be located adjacent to security screening devices. The accessible route shall permit persons with disabilities passing around security barriers to maintain visual contact with their personal items to the same extent provided others passing through the security barrier.

#### 11B-207 Accessible means of egress

**11B-207.1 General.** Means of egress shall comply with Chapter 10, Section 1007.

##### Exceptions:

1. Where means of egress are permitted by local building or life safety codes to share a common path of egress travel, accessible means of egress shall be permitted to share a common path of egress travel.
2. Areas of refuge shall not be required in detention and correctional facilities.

**11B-207.2 Platform lifts.** Standby power shall be provided for platform lifts permitted by Chapter 10, Section 1007.5 to serve as a part of an accessible means of egress. *To ensure continued operation in case of primary power loss, platform lifts shall be provided with standby power or with self-rechargeable battery power that provides sufficient power to operate all platform lift functions for a minimum of five upward and downward trips.*

#### 11B-208 Parking spaces

**11B-208.1 General.** Where parking spaces are provided, parking spaces shall be provided in accordance with Section 11B-208.

**Exception:** Parking spaces used exclusively for buses, trucks, other delivery vehicles, or vehicular impound shall not be required to comply with Section 11B-208 provided

**TABLE 11B-208.2  
PARKING SPACES**

TOTAL NUMBER OF PARKING SPACES PROVIDED IN PARKING FACILITY	MINIMUM NUMBER OF REQUIRED ACCESSIBLE PARKING SPACES
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20, plus 1 for each 100, or fraction thereof, over 1000

that lots accessed by the public are provided with a passenger loading zone complying with *Section 11B-503*.

**11B-208.2 Minimum number.** Parking spaces complying with *Section 11B-502* shall be provided in accordance with Table 11B-208.2 except as required by *Sections 11B-208.2.1, 11B-208.2.2, and 11B-208.2.3*. Where more than one parking facility is provided on a site, the number of accessible spaces provided on the site shall be calculated according to the number of spaces required for each parking facility.

**11B-208.2.1 Hospital outpatient facilities.** Ten percent of patient and visitor parking spaces provided to serve hospital outpatient facilities, and free-standing buildings providing outpatient clinical services of a hospital, shall comply with *Section 11B-502*.

**11B-208.2.2 Rehabilitation facilities and outpatient physical therapy facilities.** Twenty percent of patient and visitor parking spaces provided to serve rehabilitation facilities specializing in treating conditions that affect mobility and outpatient physical therapy facilities shall comply with *Section 11B-502*.

**11B-208.2.3 Residential facilities.** Parking spaces provided to serve residential facilities shall comply with *Section 11B-208.2.3*.

**11B-208.2.3.1 Parking for residents.** Where at least one parking space is provided for each residential dwelling unit, at least one parking space complying with *Section 11B-502* shall be provided for each residential dwelling unit required to provide mobility features complying with *Sections 11B-809.2 through 11B-809.4*.

**11B-208.2.3.2 Additional parking spaces for residents.** Where the total number of parking spaces provided for each residential dwelling unit exceeds one parking space per residential dwelling unit, 2 percent, but no fewer than one space, of all the parking spaces not covered by *Section 11B-208.2.3.1* shall comply with *Section 11B-502*.

**11B-208.2.3.3 Parking for guests, employees, and other non-residents.** Where parking spaces are provided for persons other than residents, parking shall be provided in accordance with Table 11B-208.2.

*Note: When assigned parking is provided, Chapter 11A indicates designated accessible parking for the adaptable residential dwelling units shall be provided on requests of residents with disabilities on the same terms and with the full range of choices (e.g., off-street parking, carport or garage) that are available to other residents.*

**11B-208.2.4 Van parking spaces.** For every six or fraction of six parking spaces required by *Section 11B-208.2* to comply with *Section 11B-502*, at least one shall be a van parking space complying with *Section 11B-502*.

**11B-208.3 Location.** Parking facilities shall comply with *Section 11B-208.3*.

**11B-208.3.1 General.** Parking spaces complying with *Section 11B-502* that serve a particular building or facility shall be located on the shortest accessible route from parking to an entrance complying with *Section 11B-206.4*. Where parking serves more than one accessible entrance, parking spaces complying with *Section 11B-502* shall be dispersed and located on the shortest accessible route to the accessible entrances. In parking facilities that do not serve a particular building or facility, parking spaces complying with *Section 11B-502* shall be located on the shortest accessible route to an accessible pedestrian entrance of the parking facility.

#### Exceptions:

1. All van parking spaces shall be permitted to be grouped on one level within a multi-story parking facility.
2. Parking spaces shall be permitted to be located in different parking facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, parking fee, and user convenience.

**11B-208.3.2 Residential facilities.** In residential facilities containing residential dwelling units required to provide mobility features complying with Sections 11B-809.2 through 11B-809.4, and adaptable features complying with Chapter 11A, Division IV, parking spaces provided in accordance with Section 11B-208.2.3.1 shall be located on the shortest accessible route to the residential dwelling unit entrance they serve. Spaces provided in accordance with Section 11B-208.2.3.2 shall be dispersed throughout all types of parking provided for the residential dwelling units.

**Exception:** Parking spaces provided in accordance with Section 11B-208.2.3.2 shall not be required to be dispersed throughout all types of parking if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance, parking fee, and user convenience.

**11B-208.3.3 Private garages accessory to residential dwelling units.** Private garages accessory to residential dwelling units shall comply with Section 11B-208.3. Private garages include individual garages and multiple individual garages grouped together.

**11B-208.3.3.1 Detached private garages accessory to residential dwelling units shall be accessible as required by Section 11B-208.3.**

**11B-208.3.3.2 Attached private garages directly serving a single residential dwelling unit shall provide at least one of the following options:**

1. A door leading directly from the residential dwelling unit which immediately enters the garage.
2. An accessible route from the residential dwelling unit to an exterior door entering the garage.
3. An accessible route from the residential dwelling unit's primary entry door to the vehicular entrance at the garage.

#### 11B-209 Passenger loading zones and bus stops

**11B-209.1 General.** Passenger loading zones shall be provided in accordance with Section 11B-209.

**11B-209.2 Type.** Where provided, passenger loading zones shall comply with Section 11B-209.2.

**11B-209.2.1 Passenger loading zones.** Passenger loading zones, except those required to comply with Sections 11B-209.2.2 and 11B-209.2.3, shall provide at least one passenger loading zone complying with Section 11B-503 in every continuous 100 linear feet (30480 mm) of loading zone space, or fraction thereof.

**11B-209.2.2 Bus loading zones.** In bus loading zones restricted to use by designated or specified public transportation vehicles, each bus bay, bus stop, or other area designated for lift or ramp deployment shall comply with Section 11B-810.2.

**11B-209.2.3 On-street bus stops.** On-street bus stops shall comply with Section 11B-810.2 to the maximum extent practicable.

**11B-209.3 Medical care and long-term care facilities.** At least one passenger loading zone complying with Section 11B-503 shall be provided at an accessible entrance to licensed medical care and licensed long-term care facilities where the period of stay may exceed twenty-four hours.

**11B-209.4 Valet parking.** Parking facilities that provide valet parking services shall provide at least one passenger loading zone complying with Section 11B-503. The parking requirements of Section 11B-208.1 apply to facilities with valet parking.

**11B-209.5 Mechanical access parking garages.** Mechanical access parking garages shall provide at least one passenger loading zone complying with Section 11B-503 at vehicle drop-off and vehicle pick-up areas.

#### 11B-210 Stairways

**11B-210.1 General.** Interior and exterior stairs shall comply with Section 11B-504.

##### Exceptions:

1. In detention and correctional facilities, stairs that are not located in public use areas shall not be required to comply with Section 11B-504.
2. In alterations, stairs between levels that are connected by an accessible route shall not be required to comply with Section 11B-504, except that striping complying with Section 11B-504.4.1 and handrails complying with Section 11B-505 shall be provided when the stairs are altered.
3. In assembly areas, aisle stairs shall not be required to comply with Section 11B-504 except that striping complying with Section 11B-504.4.1 shall be provided.
4. Stairs that connect play components shall not be required to comply with Section 11B-504 except that striping complying with Section 11B-504.4.1 shall be provided.

#### 11B-211 Drinking fountains

**11B-211.1 General.** Where drinking fountains are provided on an exterior site, on a floor, or within a secured area they shall be provided in accordance with Section 11B-211.

**Exception:** In detention or correctional facilities, drinking fountains only serving holding or housing cells not required to comply with Section 11B-232 shall not be required to comply with Section 11B-211.

**11B-211.2 Minimum number.** No fewer than two drinking fountains shall be provided. When provided, one drinking fountain shall comply with Sections 11B-602.1 through 11B-602.6, 11B-602.8 and 11B-602.9 and one drinking fountain shall comply with Sections 11B-602.7 and 11B-602.9.

**Exception:** Where a single drinking fountain complies with Sections 11B-602.1 through 11B-602.9, it shall be permitted to be substituted for two separate drinking fountains.

**11B-211.3 More than minimum number.** Where more than the minimum number of drinking fountains specified in Section 11B-211.2 are provided, 50 percent of the total number of drinking fountains provided shall comply with Sections

|| 11B-602.1 through 11B-602.6, 11B-602.8 and 11B-602.9, and 50 percent of the total number of drinking fountains provided shall comply with Sections 11B-602.7 and 11B-602.9.

**Exception:** Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down provided that the total number of drinking fountains complying with Section 11B-211 equals 100 percent of drinking fountains.

### 11B-212 Kitchens, kitchenettes, wet bars and sinks

**11B-212.1 General.** Where provided, kitchens, kitchenettes, wet bars and sinks shall comply with Section 11B-212.

**11B-212.2 Kitchens, kitchenettes, and wet bars.** Kitchens, kitchenettes and wet bars shall comply with Section 11B-804.

**11B-212.3 Sinks.** Where sinks are provided, at least 5 percent, but no fewer than one, of each type provided in each accessible room or space shall comply with Section 11B-606.

#### Exceptions:

1. Mop, service or scullery sinks shall not be required to comply with Section 11B-212.3.
2. Scrub sinks, as defined in California Plumbing Code Section 221.0, shall not be required to comply with Section 11B-606.

### 11B-213 Toilet facilities and bathing facilities

**11B-213.1 General.** Where toilet facilities and bathing facilities are provided, they shall comply with Section 11B-213. Where toilet facilities and bathing facilities are provided in facilities permitted by Section 11B-206.2.3 *Exception 1* not to connect stories by an accessible route, toilet facilities and bathing facilities shall be provided on a story connected by an accessible route to an accessible entrance.

#### 11B-213.1.1 Toilet facilities for designated user groups.

Where separate toilet facilities are provided for the exclusive use of separate user groups, the toilet facilities serving each user group shall comply with Section 11B-213.

**11B-213.2 Toilet rooms and bathing rooms.** Where toilet rooms are provided, each toilet room shall comply with Section 11B-603. Where bathing rooms are provided, each bathing room shall comply with Section 11B-603.

#### Exceptions:

1. In alterations where it is technically infeasible to comply with Section 11B-603, altering existing toilet or bathing rooms shall not be required where a single unisex toilet room or bathing room complying with Section 11B-213.2.1 is provided and located in the same area and on the same floor as existing inaccessible toilet or bathing rooms.
2. Reserved.
3. Where multiple single user portable toilet or bathing units are clustered at a single location 5 percent, but no fewer than one, of the toilet units and bathing units at each cluster shall comply with Section 11B-603. Portable toilet units and bathing units complying with Section 11B-603 shall be identified by the International Symbol of Accessibility complying with Section 11B-703.7.2.1.

4. Where multiple single user toilet rooms are clustered at a single location, 50 percent, but no fewer than one, of the single user toilet rooms for each use at each cluster shall comply with Section 11B-603.

5. Where toilet and bathing rooms are provided in guest rooms that are not required to provide mobility features complying with Section 11B-806.2, toilet and bathing fixtures shall only be required to comply with Section 11B-603.6.

**11B-213.2.1 Unisex (single-use or family) toilet and unisex bathing rooms.** Unisex toilet rooms shall contain not more than one lavatory, and not more than two water closets without urinals or one water closet and one urinal. Unisex bathing rooms shall contain one shower or one shower and one bathtub, one lavatory, and one water closet. Doors to unisex toilet rooms and unisex bathing rooms shall have privacy latches.

**11B-213.2.2 Unisex (Patient) toilet rooms in medical care and long-term care facilities.** Common-use unisex toilet rooms for exclusive patient use not located within patient bedrooms shall contain a lavatory and one water closet.

**11B-213.2.3 Unisex (Patient) bathing rooms in medical care and long-term care facilities.** Common-use unisex bathing rooms for exclusive patient use not located within patient bedrooms shall contain one shower or one bathtub, one lavatory, and one water closet.

**11B-213.3 Plumbing fixtures and accessories.** Plumbing fixtures and accessories provided in a toilet room or bathing room required to comply with Section 11B-213.2 shall comply with Section 11B-213.3.

**11B-213.3.1 Toilet compartments.** Where toilet compartments are provided, at least 5 percent but no fewer than one toilet compartment shall comply with Section 11B-604.8.1. In addition to the compartments required to comply with Section 11B-604.8.1, where six or more toilet compartments are provided, or where the combination of urinals and water closets totals six or more fixtures, toilet compartments complying with Section 11B-604.8.2 shall be provided in the same quantity as the toilet compartments required to comply with Section 11B-604.8.1.

**11B-213.3.2 Water closets.** Where water closets are provided, at least 5 percent but no fewer than one shall comply with Section 11B-604.

**11B-213.3.3 Urinals.** Where one or more urinals are provided, at least 10 percent but no fewer than one shall comply with Section 11B-605.

**11B-213.3.4 Lavatories.** Where lavatories are provided, at least 10 percent but no fewer than one shall comply with Section 11B-606 and shall not be located in a toilet compartment.

**11B-213.3.5 Mirrors.** Where mirrors are provided, at least one shall comply with Section 11B-603.3.

**11B-213.3.6 Bathing facilities.** Where bathtubs or showers are provided, at least one bathtub complying with Section 11B-607 or at least one shower complying with Section 11B-608 shall be provided. Where two or more accessible showers are provided within the same func-

tional area, at least one shower shall be opposite hand from the other or others (that is, one left-hand controls versus right-hand controls).

**11B-213.3.7 Coat hooks and shelves.** Where coat hooks or shelves are provided in toilet rooms without toilet compartments, at least one of each type shall comply with *Section 11B-603.4*. Where coat hooks or shelves are provided in toilet compartments, at least one of each type complying with *Section 11B-604.8.3* shall be provided in toilet compartments required to comply with *Section 11B-213.3.1*. Where coat hooks or shelves are provided in bathing facilities, at least one of each type complying with *Section 11B-603.4* shall serve fixtures required to comply with *Section 11B-213.3.6*.

#### **11B-214 Washing machines and clothes dryers**

**11B-214.1 General.** Where provided, washing machines and clothes dryers shall comply with *Section 11B-214*.

**11B-214.2 Washing machines.** Where three or fewer washing machines are provided, at least one shall comply with *Section 11B-611*. Where more than three washing machines are provided, at least two shall comply with *Section 11B-611*.

**11B-214.3 Clothes dryers.** Where three or fewer clothes dryers are provided, at least one shall comply with *Section 11B-611*. Where more than three clothes dryers are provided, at least two shall comply with *Section 11B-611*.

#### **11B-215 Fire alarm systems and carbon monoxide alarm systems**

**11B-215.1 General.** Where fire alarm systems and carbon monoxide alarm systems provide audible alarm coverage, alarms shall comply with *Section 11B-215*.

**Exception:** In existing facilities, visible alarms for fire alarm systems shall not be required except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.

**11B-215.2 Public and common use areas.** Alarms in public use areas and common use areas shall comply with *Chapter 9, Section 907.5.2.3.1*.

**11B-215.3 Employee work areas.** Where employee work areas have audible alarm coverage, the wiring system shall be designed so that visible alarms complying with *Chapter 9, Section 907.5.2.3.2* can be integrated into the alarm system.

**11B-215.4 Transient lodging.** Guest rooms required to comply with *Section 11B-224.4* shall provide fire alarms complying with *Chapter 9, Section 907.5.2.3.3, and carbon monoxide alarms, where provided, complying with Chapter 4*.

**11B-215.5 Residential facilities.** Where provided in residential dwelling units required to comply with *Section 11B-809.5, fire alarms shall comply with Chapter 9, Section 907.5.2.3.4 and carbon monoxide alarms shall comply with Chapter 4*.

#### **11B-216 Signs**

**11B-216.1 General.** New or altered signs shall be provided in accordance with *Section 11B-216* and shall comply with

Section 11B-703. The addition of or replacement of signs shall not trigger any additional path of travel requirements.

#### **Exceptions:**

1. Building directories, menus, seat and row designations in assembly areas, occupant names, building addresses, and company names and logos shall not be required to comply with *Section 11B-216*.
2. Reserved.
3. Temporary, 7 days or less, signs shall not be required to comply with *Section 11B-216*.
4. In detention and correctional facilities, signs not located in public use areas shall not be required to comply with *Section 11B-216*.

**11B-216.2 Designations.** Interior and exterior signs identifying permanent rooms and spaces shall comply with *Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5*. Where pictograms are provided as designations of permanent rooms and spaces, the pictograms shall comply with *Section 11B-703.6* and shall have text descriptors complying with *Sections 11B-703.2 and 11B-703.5*.

**Exception:** Exterior signs that are not located at the door to the space they serve shall not be required to comply with *Section 11B-703.2*.

**11B-216.3 Directional and informational signs.** Signs that provide direction to or information about interior and exterior spaces and facilities of the site shall comply with *Section 11B-703.5*.

**11B-216.4 Means of egress.** Signs for means of egress shall comply with *Section 11B-216.4*.

**11B-216.4.1 Exit doors.** Signs required by *Chapter 10, Section 1011.4 at doors to exit passageways, exit discharge, and exit stairways* shall comply with *Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5*.

**11B-216.4.2 Areas of refuge and exterior areas for assisted rescue.** Signs required by *Chapter 10, Section 1007.11 to provide instructions in areas of refuge* shall comply with *Section 11B-703.5. Signs required by Chapter 10, Section 1007.9 at doors to areas of refuge and exterior areas for assisted rescue shall comply with Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5 and include an International Symbol of Accessibility complying with Section 11B-703.7.2.1*.

**11B-216.4.3 Directional signs.** Signs required by *Chapter 10, Section 1007.10 to provide directions to accessible means of egress* shall comply with *Section 11B-703.5*.

**11B-216.4.4 Delayed egress locks.** Signs required by *Chapter 10, Section 1008.1.9.7, Item 5.1 at doors with delayed egress locks* shall comply with *Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5*.

**11B-216.5 Parking.** Signs identifying parking spaces and signs within parking facilities shall comply with *Section 11B-216.5*.

**11B-216.5.1 Parking spaces.** Parking spaces complying with Section 11B-502 shall be identified by signs complying with Section 11B-502.6.

**Exceptions:**

1. **Reserved.**
2. In residential facilities, where parking spaces are assigned to specific residential dwelling units, identification of accessible parking spaces shall not be required.

**11B-216.5.2 Parking facilities.** Signs intended for use by pedestrians within parking facilities, including directional or informational signs indicating parking sections or levels, shall comply with the requirements of Section 11B-216.

**11B-216.6 Entrances.** In existing buildings and facilities where not all entrances comply with Section 11B-404, entrances complying with Section 11B-404 shall be identified by the International Symbol of Accessibility complying with Section 11B-703.7.2.1. Directional signs complying with Section 11B-703.5 that indicate the location of the nearest entrance complying with Section 11B-404 shall be provided at entrances that do not comply with Section 11B-404. Directional signs complying with Section 11B-703.5, including the International Symbol of Accessibility complying with Section 11B-703.7.2.1, indicating the accessible route to the nearest accessible entrance shall be provided at junctions when the accessible route diverges from the regular circulation path.

**Exceptions:**

1. An International Symbol of Accessibility is not required at entrances to individual rooms, suites, offices, sales or rental establishments, or other such spaces when all entrances to the building or facility are accessible and persons entering the building or facility have passed through one or more entrances with signage complying with this section.
2. An International Symbol of Accessibility is not required at entrances to machinery spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment; for example, elevator pits or elevator penthouses; mechanical, electrical or communications equipment rooms; piping or equipment catwalks; electric substations and transformer vaults; and highway and tunnel utility facilities.

**11B-216.7 Elevators.** Where existing elevators do not comply with Section 11B-407, elevators complying with Section 11B-407 shall be clearly identified with the International Symbol of Accessibility complying with Section 11B-703.7.2.1. Existing buildings that have been remodeled to provide specific elevators for public use that comply with these building standards shall have the location of and the directions to these elevators posted in the building lobby on a sign complying with Section 11B-703.5, including the International Symbol of Accessibility complying with Section 11B-703.7.2.1.

**11B-216.8 Toilet rooms and bathing rooms.** Entrances to toilet rooms and bathing rooms shall be identified by a geometric symbol complying with Section 11B-703.7.2.6. Where existing toilet rooms or bathing rooms do not comply with

Section 11B-603, directional signs indicating the location of the nearest toilet room or bathing room complying with Section 11B-603 within the facility shall be provided. Signs shall comply with Section 11B-703.5 and shall include the International Symbol of Accessibility complying with Section 11B-703.7.2.1. Where existing toilet rooms or bathing rooms do not comply with Section 11B-603, the toilet rooms or bathing rooms complying with Section 11B-603 shall be identified by the International Symbol of Accessibility complying with Section 11B-703.7.2.1. Where clustered single user toilet rooms or bathing facilities are permitted to use exceptions to Section 11B-213.2, toilet rooms or bathing facilities complying with Section 11B-603 shall be identified by the International Symbol of Accessibility complying with Section 11B-703.7.2.1 unless all toilet rooms and bathing facilities comply with Section 11B-603. Existing buildings that have been remodeled to provide specific toilet rooms or bathing rooms for public use that comply with these building standards shall have the location of and the directions to these rooms posted in or near the building lobby or entrance on a sign complying with Section 11B-703.5, including the International Symbol of Accessibility complying with Section 11B-703.7.2.1.

**11B-216.9 TTYs.** Identification and directional signs for public TTYs shall be provided in accordance with Section 11B-216.9.

**11B-216.9.1 Identification signs.** Public TTYs shall be identified by the International Symbol of TTY complying with Section 11B-703.7.2.2.

**11B-216.9.2 Directional signs.** Directional signs indicating the location of the nearest public TTY shall be provided at all banks of public pay telephones not containing a public TTY. In addition, where signs provide direction to public pay telephones, they shall also provide direction to public TTYs. If a facility has no banks of telephones, the directional signage shall be provided at the entrance or in a building directory. Directional signs shall comply with Section 11B-703.5 and shall include the International Symbol of TTY complying with Section 11B-703.7.2.2.

**11B-216.10 Assistive listening systems.** Each assembly area required by Section 11B-219 to provide assistive listening systems shall provide signs informing patrons of the availability of the assistive listening system. The sign shall include wording that states "Assistive-Listening System Available" and shall be posted in a prominent place at or near the assembly area entrance. Assistive listening signs shall comply with Section 11B-703.5 and shall include the International Symbol of Access for Hearing Loss complying with Section 11B-703.7.2.4.

**Exception:** Where ticket offices or windows are provided, signs shall not be required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.

**11B-216.11 Check-out aisles.** Where more than one check-out aisle is provided, check-out aisles complying with Section 11B-904.3 shall be identified by a sign complying with Section 11B-904.3.4. Where check-out aisles are identified by numbers, letters, or functions, signs identifying check-out

aisles complying with Section 11B-904.3 shall be located in the same location as the check-out aisle identification.

**Exception:** Where all check-out aisles comply with Section 11B-904.3, signs complying with Section 11B-703.7.2.1 shall not be required.

**11B-216.12 Amusement rides.** Signs identifying the type of access provided on amusement rides shall be provided at entries to queues and waiting lines. In addition, where accessible unload areas also serve as accessible load areas, signs indicating the location of the accessible load and unload areas shall be provided at entries to queues and waiting lines. *Signs shall comply with Section 11B-703.5 and shall include the International Symbol of Accessibility complying with Section 11B-703.7.2.1.*

#### **11B-216.13 Cleaner Air Symbol**

**11B-216.13.1 Use of Cleaner Air Symbol.** Use of the Cleaner Air Symbol is voluntary. Where publicly funded facilities or any facilities leased or rented by the State of California, not including concessionaires, comply with the conditions of use identified in Section 11B-216.13.3, a Cleaner Air Symbol complying with Section 11B-703.7.2.5 is permitted to be posted in compliance with Section 11B-216.3 to indicate rooms, facilities, and paths of travel that are accessible to and usable by people who are adversely impacted by airborne chemicals or particulates and/or the use of electrical fixtures and/or devices.

**11B-216.13.2 Removal of Cleaner Air Symbol.** If the path of travel, room and/or facility identified by the Cleaner Air Symbol should temporarily or permanently cease to meet the minimum conditions of use identified in Section 11B-216.13.3, the Cleaner Air Symbol shall be removed and shall not be replaced until the minimum conditions are again met.

**11B-216.13.3 Conditions of use.** The Cleaner Air Symbol shall be permitted for use to identify a path of travel, and a room or a facility when the following is met:

1. Floor or wall coverings, floor or wall covering adhesives, carpets, formaldehyde-emitting particle-board cabinetry, cupboards or doors have not been installed or replaced in the previous 12 months.
2. Incandescent lighting provided in lieu of fluorescent or halogen lighting, and electrical systems and equipment shall be operable by or on behalf of the occupant or user of the room, facility or path of travel.
3. Heating, ventilation, air conditioning and their controls shall be operable by or on behalf of the occupant or user.
4. To maintain "cleaner air" designation only nonirritating, nontoxic products will be used in cleaning,

maintenance, disinfection, pest management or for any minimal touch-ups that are essential for occupancy of the area. Deodorizers or Fragrance Emission Devices and Systems (FEDS) shall not be used in the designated area. Pest control practices for cleaner air areas shall include the use of bait stations using boric acid, sticky traps and silicon caulk for sealing cracks and crevices. Areas shall be routinely monitored for pest problems. Additional nontoxic treatment methods, such as temperature extremes for termites, may be employed in the event of more urgent problems. These pest control practices shall not be used 48 hours prior to placement of the sign, and the facility shall be ventilated with outside air for a minimum of 24 hours following use or application.

5. Signage shall be posted requesting occupants or users not to smoke or wear perfumes, colognes or scented personal care products. Fragranced products shall not be used in the designated cleaner-air room, facility or path of travel.
6. A log shall be maintained on site, accessible to the public either in person or by telephone, e-mail, fax or other accessible means as requested. One or more individuals shall be designated to maintain the log. The log shall record any product or practice used in the cleaner air designated room, facility or path of travel, as well as scheduled activities, that may impact the cleaner air designation. The log shall also include the product label as well as the Material Safety Data Sheets (MSDS).

**11B-216.14 Variable message signs.** Where provided in transportation facilities, variable message signs conveying transportation-related information shall comply with Section 11B-703.8. Where provided in buildings that are designed as emergency shelters, variable message signs conveying emergency-related information shall comply with Section 11B-703.8.

#### **11B-217 Telephones**

**11B-217.1 General.** Where coin-operated public pay telephones, coinless public pay telephones, public closed-circuit telephones, public courtesy phones, or other types of public telephones are provided, public telephones shall be provided in accordance with Section 11B-217 for each type of public telephone provided. For purposes of this section, a bank of telephones shall be considered to be two or more adjacent telephones.

**11B-217.2 Wheelchair accessible telephones.** Where public telephones are provided, wheelchair accessible telephones complying with Section 11B-704.2 shall be provided in accordance with Table 11B-217.2.

**TABLE 11B-217.2  
WHEELCHAIR ACCESSIBLE TELEPHONES**

NUMBER OF TELEPHONES PROVIDED ON A FLOOR, LEVEL, OR EXTERIOR SITE	MINIMUM NUMBER OF REQUIRED WHEELCHAIR ACCESSIBLE TELEPHONES
1 or more single units	<i>At least 50 percent of telephone units, but not less than 1 per floor, level, and exterior site</i>
1 bank	<i>At least 50 percent of telephone units per bank, but not less than 1 per floor, level, and exterior site</i>
2 or more banks	<i>At least 50 percent of telephone units per bank, but not less than 1 per bank</i> <i>At least 1 telephone per floor shall meet the requirements for a forward reach telephone.</i>

**Exception:** Drive-up only public telephones shall not be required to comply with *Section 11B-217.2*.

**11B-217.3 Volume controls.** All public telephones shall have volume controls complying with *Section 11B-704.3*.

**11B-217.4 TTYs.** TTYs complying with *Section 11B-704.4* shall be provided in accordance with *Section 11B-217.4*.

**11B-217.4.1 Bank requirement.** Where four or more public pay telephones are provided at a bank of telephones, at least one public TTY complying with *Section 11B-704.4* shall be provided at that bank.

**Exception: Reserved.**

**11B-217.4.2 Floor requirement.** TTYs in public buildings shall be provided in accordance with *Section 11B-217.4.2.1*. TTYs in private buildings shall be provided in accordance with *Section 11B-217.4.2.2*.

**11B-217.4.2.1 Public buildings.** Where at least one public pay telephone is provided on a floor of a public building, at least one public TTY shall be provided on that floor.

**11B-217.4.2.2 Private buildings.** Where four or more public pay telephones are provided on a floor of a private building, at least one public TTY shall be provided on that floor.

**11B-217.4.3 Building requirement.** TTYs in public buildings shall be provided in accordance with *Section 11B-217.4.3.1*. TTYs in private buildings shall be provided in accordance with *Section 11B-217.4.3.2*.

**11B-217.4.3.1 Public buildings.** Where at least one public pay telephone is provided in a public building, at least one public TTY shall be provided in the building. Where at least one public pay telephone is provided in a public use area of a public building, at least one public TTY shall be provided in the public building in a public use area.

**11B-217.4.3.2 Private buildings.** Where four or more public pay telephones are provided in a private building, at least one public TTY shall be provided in the building.

**Exception:** In a stadium or arena, in a convention center, in a hotel with a convention center or in a covered mall, if an interior public pay telephone is provided at least one interior public TTY shall be provided in the facility.

**11B-217.4.4 Exterior site requirement.** Where four or more public pay telephones are provided on an exterior site, at least one public TTY shall be provided on the site.

**11B-217.4.5 Rest stops, emergency roadside stops, and service plazas.** Where at least one public pay telephone is provided at a public rest stop, emergency roadside stop, or service plaza, at least one public TTY shall be provided.

**11B-217.4.6 Hospitals.** Where at least one public pay telephone is provided serving a hospital emergency room, hospital recovery room, or hospital waiting room, at least one public TTY shall be provided at each location.

**11B-217.4.7 Transportation facilities.** In transportation facilities, in addition to the requirements of *Sections 11B-*

217.4.1 through 11B-217.4.4, where at least one public pay telephone serves a particular entrance to a bus or rail facility, at least one public TTY shall be provided to serve that entrance. In airports, in addition to the requirements of *Sections 11B-217.4.1 through 11B-217.4.4*, where four or more public pay telephones are located in a terminal outside the security areas, a concourse within the security areas, or a baggage claim area in a terminal, at least one public TTY shall be provided in each location.

**11B-217.4.8 Detention and correctional facilities.** In detention and correctional facilities, where at least one pay telephone is provided in a secured area used only by detainees or inmates and security personnel, at least one TTY shall be provided in at least one secured area.

**11B-217.5 Shelves for portable TTYs.** Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone at the bank shall be provided with a shelf and an electrical outlet in accordance with *Section 11B-704.5*.

**Exceptions:**

1. Secured areas of detention and correctional facilities where shelves and outlets are prohibited for purposes of security or safety shall not be required to comply with *Section 11B-217.5*.
2. The shelf and electrical outlet shall not be required at a bank of telephones with a TTY.

#### **11B-218 Transportation facilities.**

**11B-218.1 General.** Transportation facilities shall comply with *Section 11B-218*.

**11B-218.2 New and altered fixed guideway stations.** New and altered stations in rapid rail, light rail, commuter rail, intercity rail, high speed rail, and other fixed guideway systems shall comply with *Sections 11B-810.5 through 11B-810.10*.

**11B-218.3 Key stations and existing intercity rail stations.** Key stations and existing intercity rail stations shall comply with *Sections 11B-810.5 through 11B-810.10*.

**11B-218.4 Bus shelters.** Where provided, bus shelters shall comply with *Section 11B-810.3*.

**11B-218.5 Other transportation facilities.** In other transportation facilities, public address systems shall comply with *Section 11B-810.7* and clocks shall comply with *Section 11B-810.8*.

#### **11B-219 Assistive listening systems**

**11B-219.1 General.** Assistive listening systems shall be provided in accordance with *Section 11B-219* and shall comply with *Section 11B-706*.

**11B-219.2 Required systems.** An assistive listening system shall be provided in assembly areas, including conference and meeting rooms.

**Exception:** This section does not apply to systems used exclusively for paging, background music, or a combination of these two uses.

**11B-219.3 Receivers.** The minimum number of receivers to be provided shall be equal to 4 percent of the total number of

seats, but in no case less than two. Twenty-five percent minimum of receivers provided, but no fewer than two, shall be hearing-aid compatible in accordance with Section 11B-706.3.

**Exceptions:**

1. Where a building contains more than one assembly area and the assembly areas required to provide assistive listening systems are under one management, the total number of required receivers shall be permitted to be calculated according to the total number of seats in the assembly areas in the building provided that all receivers are usable with all systems.
2. Where all seats in an assembly area are served by an induction loop assistive listening system, the minimum number of receivers required by Section 11B-219.3 to be hearing-aid compatible shall not be required to be provided.

**11B-219.4 Location.** If the assistive-listening system provided is limited to specific areas or seats, then such areas or seats shall be within a 50-foot (15240 mm) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

**11B-219.5 Permanent and portable systems.** Permanently installed assistive-listening systems are required in areas if (1) they accommodate at least 50 persons or if they have audio-amplification systems, and (2) they have fixed seating. If portable assistive-listening systems are used for conference or meeting rooms, the system may serve more than one room. An adequate number of electrical outlets or other supplementary wiring necessary to support a portable assistive-listening system shall be provided.

**11B-220 Automatic teller machines, fare machines and point-of-sale devices.**

**11B-220.1 Automatic teller machines and fare machines.** Where automatic teller machines or self-service fare vending, collection, or adjustment machines are provided they shall comply with Section 11B-220.1. Where bins are provided for envelopes, waste paper, or other purposes, at least one of each type shall comply with Section 11B-811.

**11B-220.1.1 One automatic teller machine or fare machine.** Where one automatic teller machine or fare machine is provided at a location, it shall comply with Sections 11B-707.2 through 11B-707.8.

**11B-220.1.2 Two automatic teller machines or fare machines.** Where two automatic teller machines or fare machines are provided at a location, one shall comply with Sections 11B-707.2 through 11B-707.8 and one shall comply with Sections 11B-309, 11B-707.2, 11B-707.4, 11B-707.5, 11B-707.6, 11B-707.7.2 and 11B-707.8.

**11B-220.1.3 Three or more automatic teller machines or fare machines.** Where three or more automatic teller machines or fare machines are provided at a location, at least 50 percent shall comply with Sections 11B-707.2 through 11B-707.8 and the rest shall comply with Sections 11B-309, 11B-707.2, 11B-707.4, 11B-707.5, 11B-707.6, 11B-707.7.2 and 11B-707.8.

**11B-220.2 Point-of-sale devices.** Where point-of-sale devices are provided, all devices at each location shall comply with Sections 11B-309.4, 11B-707.3, and 11B-707.7.2. In addition, point-of-sale systems that include a video touch screen or any other non-tactile keypad shall comply with either Section 11B-707.9.1.1 or 11B-707.9.1.2. Where point-of-sale devices are provided at check stands and sales and service counters, they shall comply with Section 11B-707.9.1, and shall also comply with Sections 11B-707.2, 11B-707.3 and 11B-707.4.

**Exception:** Where a single point-of-sale device is installed for use with any type of motor fuel, it shall comply with Sections 11B-220.2 and 11B-309. Where more than one point-of-sale device is installed for use with a specific type of motor fuel, a minimum of two for that type shall comply with Sections 11B-220.2 and 11B-309. Types of motor fuel include, but are not limited to, gasoline, diesel, compressed natural gas, methanol, ethanol or electricity.

**11B-221 Assembly areas**

**11B-221.1 General.** Assembly areas shall provide wheelchair spaces, companion seats, designated aisle seats and semi-ambulant seats complying with Sections 11B-221 and 11B-802. In addition, lawn seating shall comply with Section 11B-221.5.

**11B-221.2 Wheelchair spaces.** Wheelchair spaces complying with Section 11B-221.2 shall be provided in assembly areas with fixed seating.

**11B-221.2.1 Number and location.** Wheelchair spaces shall be provided complying with Section 11B-221.2.1.

**11B-221.2.1.1 General seating.** Wheelchair spaces complying with Section 11B-802.1 shall be provided in accordance with Table 11B-221.2.1.1.

**TABLE 11B-221.2.1.1  
NUMBER OF WHEELCHAIR SPACES IN ASSEMBLY AREAS**

NUMBER OF SEATS	MINIMUM NUMBER OF REQUIRED WHEELCHAIR SPACES
4 to 25	1
26 to 50	2
51 to 150	4
151 to 300	5
301 to 500	6
501 to 5000	6, plus 1 for each 100, or fraction thereof, between 501 through 5000
5001 and over	46, plus 1 for each 200, or fraction thereof, over 5000

**11B-221.2.1.2 Luxury boxes, club boxes, and suites in arenas, stadiums, and grandstands.** In each luxury box, club box, and suite within arenas, stadiums, and grandstands, wheelchair spaces complying with *Section 11B-802.1* shall be provided in accordance with Table 11B-221.2.1.1.

**11B-221.2.1.3 Other boxes.** In boxes other than those required to comply with *Section 11B-221.2.1.2*, the total number of wheelchair spaces required shall be determined in accordance with Table 11B-221.2.1.1. Wheelchair spaces shall be located in not less than 20 percent of all boxes provided. Wheelchair spaces shall comply with *Section 11B-802.1*.

**11B-221.2.1.4 Team or player seating.** At least one wheelchair space complying with *Section 11B-802.1* shall be provided in team or player seating areas serving areas of sport activity.

**Exception:** Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes not required to comply with *Section 11B-206.2.11*.

**11B-221.2.1.5 Stadium-style movie theaters.** In stadium-style movie theaters, the total number of wheelchair spaces required shall be determined in accordance with Table 11B-221.2.1.1. The required wheelchair spaces shall be located on risers or cross-aisles in the stadium section that satisfy at least one of the following criteria:

1. Located within the rear 60 percent of the seats provided in the theater; or
2. Located within the area of the theater in which the vertical viewing angles (as measured to the top of the screen) are from the 40<sup>th</sup> to the 100<sup>th</sup> percentile of vertical viewing angles for all seats as ranked from the seats in the first row (1<sup>st</sup> percentile) to seats in the back row (100<sup>th</sup> percentile).

**11B-221.2.1.6 Specialty seating areas.** In assembly areas, wheelchair spaces shall be provided in each specialty seating area that provides spectators with distinct services or amenities that generally are not available to other spectators. The number of wheelchair spaces provided in specialty seating areas shall be included in, rather than be in addition to, the total number of wheelchair spaces required by Table 11B-221.2.1.1.

**Exception:** In existing buildings and facilities, if it is not readily achievable for wheelchair spaces to be placed in each specialty seating area, those services or amenities shall be provided to individuals with disabilities, and their companions, at other designated accessible locations at no additional cost.

**11B-221.2.2 Integration.** Wheelchair spaces shall be an integral part of the seating plan.

**11B-221.2.3 Lines of sight and dispersion.** Wheelchair spaces shall provide lines of sight complying with *Section 11B-802.2* and shall comply with *Section 11B-221.2.3*. In

providing lines of sight, wheelchair spaces shall be dispersed. Wheelchair spaces shall provide spectators with choices of seating locations and viewing angles that are substantially equivalent to, or better than, the choices of seating locations and viewing angles available to all other spectators. When the number of wheelchair spaces required by *Section 11B-221.2.1* has been met, further dispersion shall not be required. *In stadiums, arenas and grandstands, wheelchair spaces shall be dispersed to all levels that include seating served by an accessible route.*

**Exception:** Wheelchair spaces in team or player seating areas serving areas of sport activity shall not be required to comply with *Section 11B-221.2.3*.

**11B-221.2.3.1 Horizontal dispersion.** Wheelchair spaces shall be dispersed horizontally. *In assembly areas that have seating encircling, in whole or in part, a field of play or performance, wheelchair spaces shall be dispersed horizontally around the field of play or performance area.*

**Exceptions:**

1. Horizontal dispersion shall not be required in assembly areas with 300 or fewer seats if the companion seats required by *Section 11B-221.3* and wheelchair spaces are located within the 2<sup>nd</sup> or 3<sup>rd</sup> quartile of the total row length. Intermediate aisles shall be included in determining the total row length. If the row length in the 2<sup>nd</sup> and 3<sup>rd</sup> quartile of a row is insufficient to accommodate the required number of companion seats and wheelchair spaces, the additional companion seats and wheelchair spaces shall be permitted to be located in the 1<sup>st</sup> and 4<sup>th</sup> quartile of the row.
2. In row seating, two wheelchair spaces shall be permitted to be located side-by-side.

**11B-221.2.3.2 Vertical dispersion.** Wheelchair spaces shall be dispersed vertically at varying distances from the screen, performance area, or playing field. In addition, wheelchair spaces shall be located in each balcony or mezzanine that is located on an accessible route.

**Exceptions:**

1. Vertical dispersion shall not be required in assembly areas with 300 or fewer seats if the wheelchair spaces provide viewing angles that are equivalent to, or better than, the average viewing angle provided in the facility.
2. In bleachers, wheelchair spaces shall not be required to be provided in rows other than rows at points of entry to bleacher seating.

**11B-221.2.4 Temporary structures.** Wheelchair spaces shall not be located on, or be obstructed by, temporary platforms or other movable structures.

**Exception:** When an entire seating section is placed on temporary platforms or other movable structures in an area where fixed seating is not provided, in order to

*increase seating for an event, wheelchair spaces may be placed in that section.*

>|| **Note:** When required wheelchair spaces are not occupied by persons eligible for those spaces, individual, removable seats may be placed in those spaces.

**11B-221.3 Companion seats.** At least one companion seat complying with Section 11B-802.3 shall be provided *immediately adjacent to each wheelchair space required by Section 11B-221.2.1.*

**11B-221.4 Designated aisle seats.** At least 5 percent of the total number of aisle seats provided shall comply with Section 11B-802.4 and shall be the aisle seats located closest to accessible routes.

**Exception:** Team or player seating areas serving areas of sport activity shall not be required to comply with Section 11B-221.4.

**11B-221.5 Lawn seating.** Lawn seating areas and exterior overflow seating areas, where fixed seats are not provided, shall connect to an accessible route.

**11B-221.6 Semi-ambulant seats.** At least 1 percent of the total number of seats, and no fewer than two, shall be semi-ambulant seats complying with Section 11B-802.5.

#### **11B-222 Dressing, fitting, and locker rooms**

**11B-222.1 General.** Where dressing rooms, fitting rooms, or locker rooms are provided, at least 5 percent, but no fewer than one, of each type of use in each cluster provided shall comply with Section 11B-803.

**Exception:** In alterations, where it is technically infeasible to provide rooms in accordance with Section 11B-222.1, one room for each sex on each level shall comply with Section 11B-803. Where only unisex rooms are provided, unisex rooms shall be permitted.

**11B-222.2 Coat hooks and shelves.** Where coat hooks or shelves are provided in dressing, fitting or locker rooms without individual compartments, at least one of each type shall comply with Section 11B-803.5. Where coat hooks or shelves are provided in individual compartments at least one of each type complying with Section 11B-803.5 shall be provided in individual compartments in dressing, fitting, or locker rooms required to comply with Section 11B-222.1.

**11B-222.3 Mirrors.** Where mirrors are provided in dressing, fitting or locker rooms without individual compartments, at least one of each type shall comply with Section 11B-803.6. Where mirrors are provided in individual compartments at least one of each type complying with Section 11B-803.6 shall be provided in individual compartments in dressing, fitting or locker rooms required to comply with Section 11B-222.1.

#### **11B-223 Medical care and long-term care facilities**

**11B-223.1 General.** In licensed medical care facilities and licensed long-term care facilities where the period of stay exceeds twenty-four hours, patient bedrooms or resident

sleeping rooms shall be provided in accordance with Sections 11B-223 and 11B-805.

**Exception:** Toilet rooms that are part of critical or intensive care patient sleeping rooms shall not be required to comply with Section 11B-603.

**11B-223.1.1 Alterations.** Where patient bedrooms or resident sleeping rooms are altered or added, the requirements of Section 11B-223 shall apply only to the patient bedrooms or resident sleeping rooms being altered or added until the number of patient bedrooms or resident sleeping rooms complies with the minimum number required for new construction.

**11B-223.1.1.1 Area alterations.** Patient bedrooms or resident sleeping rooms added or altered as part of a planned renovation of an entire wing, a department, or other discrete area of an existing medical facility shall comply with Section 11B-805.2 until the number of patient bedrooms or resident sleeping rooms provided within the area of renovation complies with the minimum number required for new construction by Section 11B-223.2 or 11B-223.3.

**11B-223.1.1.2 Individual alterations.** Patient bedrooms or resident sleeping rooms added or altered individually, and not as part of an alteration of an entire area, shall comply with Section 11B-805.2, until either: a) the number of patient bedrooms or resident sleeping rooms provided in the department or area containing the individually altered or added patient bedrooms or resident sleeping rooms complies with the minimum number required if the percentage requirements of Section 11B-223.2 or 11B-223.3 were applied to that department or area; or b) the overall number of patient bedrooms or resident sleeping rooms in the facility complies with the minimum number required for new construction by Section 11B-223.2 or 11B-223.3.

**11B-223.1.1.3 Toilet and bathing facilities.** Toilet/bathing rooms which are part of patient bedrooms added or altered and required to be accessible shall comply with Section 11B-805.2.4.

**11B-223.2 Hospitals, rehabilitation facilities, psychiatric facilities and detoxification facilities.** Hospitals, rehabilitation facilities, psychiatric facilities and detoxification facilities shall comply with Section 11B-223.2. All public use and common use areas shall be accessible in compliance with this chapter.

**11B-223.2.1 Facilities not specializing in treating conditions that affect mobility.** In facilities not specializing in treating conditions that affect mobility, including hospitals, psychiatric and detoxification facilities, at least 10 percent, but no fewer than one, of the patient bedrooms or resident sleeping rooms shall provide mobility features complying with Section 11B-805. Accessible patient bedrooms or resident sleeping rooms shall be dispersed in a manner that is proportionate by type of medical specialty.

**11B-223.2.2 Facilities specializing in treating conditions that affect mobility.** In facilities specializing in treating conditions that affect mobility, 100 percent of the patient bedrooms shall provide mobility features complying with Section 11B-805.

**11B-223.2.3 On-call rooms.** Where physician or staff on-call sleeping rooms are provided, at least 10 percent, but no fewer than one, of the on-call rooms shall provide mobility features complying with Sections 11B-806.2.3, 11B-806.2.4 and 11B-806.2.6.

**11B-223.3 Long-term care facilities.** In licensed long-term care facilities, including skilled nursing facilities, intermediate care facilities and nursing homes, at least 50 percent, but no fewer than one, of each type of patient bedroom or resident sleeping room shall provide mobility features complying with Section 11B-805.

**11B-223.4 Professional offices of health care providers.** Professional offices of health care providers shall comply with Section 11B-805.

#### **11B-224 Transient lodging guest rooms, housing at a place of education and social service center establishments**

**11B-224.1 General.** Hotels, motels, inns, dormitories, resorts and similar transient lodging facilities shall provide guest rooms in accordance with Sections 11B-224.1 through 11B-224.6.

**11B-224.1.1 Alterations.** Where guest rooms are altered or added, the requirements of Section 11B-224 shall apply only to the guest rooms being altered or added until the number of guest rooms complies with the minimum number required for new construction.

**11B-224.1.2 Guest room doors and doorways.** Entrances, doors, and doorways providing user passage into and within guest rooms that are not required to provide mobility features complying with Section 11B-806.2 shall comply with Section 11B-404.2.3. Bathrooms doors shall be either sliding or hung to swing in the direction of egress from the bathroom.

**Exception:** Shower and sauna doors in guest rooms that are not required to provide mobility features complying with Section 11B-806.2 shall not be required to comply with Section 11B-404.2.3.

**11B-224.1.3 Range of accommodations.** Accessible guest rooms or suites shall be dispersed among the various classes of sleeping accommodations to provide a range of options applicable to room sizes, costs, and amenities provided.

**11B-224.1.4 Guest room toilet and bathing rooms.** Where toilet and bathing rooms are provided in guest rooms that are not required to provide mobility features complying with Section 11B-806.2, toilet and bathing fixtures shall only be required to comply with Section 11B-603.6.

**11B-224.2 Guest rooms with mobility features.** In transient lodging facilities, guest rooms with mobility features complying with Section 11B-806.2 shall be provided in accordance with Table 11B-224.2, as follows.

**11B-224.2.1 Fifty or less guest room facilities.** Facilities that are subject to the same permit application on a common site that each have fifty or fewer guest rooms may be combined

for the purposes of determining the required number of accessible rooms and type of accessible bathing facility.

**11B-224.2.2 More than fifty guest room facilities.** Facilities with more than fifty guest rooms shall be treated separately for the purposes of determining the required number of accessible rooms and type of accessible bathing facility.

**11B-224.3 Beds.** In guest rooms having more than 25 beds, 5 percent minimum of the beds shall have clear floor space complying with Section 11B-806.2.3.

**11B-224.4 Guest rooms with communication features.** In transient lodging facilities, guest rooms with communication features complying with Section 11B-806.3 shall be provided in accordance with Table 11B-224.4.

**11B-224.5 Dispersion.** Guest rooms required to provide mobility features complying with Section 11B-806.2 and guest rooms required to provide communication features complying with Section 11B-806.3 shall be dispersed among the various classes of guest rooms, and shall provide choices of types of guest rooms, number of beds, and other amenities comparable to the choices provided to other guests. Where the minimum number of guest rooms required to comply with Section 11B-806 is not sufficient to allow for complete dispersion, guest rooms shall be dispersed in the following priority: guest room type, number of beds, and amenities. At least one guest room required to provide mobility features complying with Section 11B-806.2 shall also provide communication features complying with Section 11B-806.3. Not more than 10 percent of guest rooms required to provide mobility features complying with Section 11B-806.2 shall be used to satisfy the minimum number of guest rooms required to provide communication features complying with Section 11B-806.3.

**11B-224.6 Storage.** Fixed or built-in storage facilities within guest rooms required to provide mobility features shall comply with Section 11B-225.

**11B-224.7 Housing at a place of education.** Housing at a place of education subject to this section shall comply with Sections 11B-224.1 through 11B-224.6 and 11B-806 for transient lodging guest rooms. For the purposes of the application of this section, the term "sleeping room" is interchangeable with "guest room" as used in the transient lodging standards.

#### **Exceptions:**

1. Kitchens within housing units containing accessible sleeping rooms with mobility features (including suites and clustered sleeping rooms) or on floors containing accessible sleeping rooms with mobility features shall provide turning spaces that comply with Section 11B-809.2.2 and kitchen work surfaces that comply with Section 11B-804.3.
2. Multi-bedroom housing units containing accessible sleeping rooms with mobility features shall have an accessible route throughout the unit in compliance with Section 11B-809.2.
3. Housing facilities that are provided by or on behalf of a place of education, with residential dwelling units leased on a year-round basis exclusively to graduate students or faculty, and that do not contain any public use or common use areas available for

*educational programming, are not subject to Section 11B-224 and shall comply with Section 11B-233.*

**11B-224.7.1 Multi-bedroom housing units with mobility features.** Multi-bedroom housing units containing accessible sleeping rooms with mobility features shall have an accessible route throughout the unit in compliance with Section 11B-809.2. Kitchens, when provided, within housing units containing accessible sleeping rooms with mobility features shall comply with Section 11B-804.

**11B-224.7.2 Multi-bedroom housing units with adaptable features.** Multi-bedroom housing units with adaptable features shall be provided as required by Section 11B-233.3.1.2. The number of required multi-bedroom housing units with adaptable features shall be reduced by the number of multi-bedroom housing units with mobility features required by Section 11B-224.2.

**11B-224.8 Social service center establishments.** Group homes, halfway houses, shelters, or similar social service center establishments that provide either temporary sleeping accommodations or residential dwelling units subject to this section shall comply with Sections 11B-224.1 through 11B-224.6 and Section 11B-233.3.

**11B-224.8.1 More than 25-bed sleeping rooms.** In sleeping rooms with more than 25 beds, a minimum of 5 percent of the beds shall have clear floor space complying with Section 11B-806.2.3.

**11B-224.8.2 More than 50-bed facilities.** Facilities with more than 50 beds that provide common use bathing facilities shall provide at least one roll-in shower with a seat that complies with Section 11B-608. When separate shower facilities are provided for men and women, at least one roll-in shower shall be provided for each group.

#### 11B-225 Storage

**11B-225.1 General.** Storage facilities shall comply with Section 11B-225.

**11B-225.2 Storage.** Where storage is provided in accessible spaces, at least one of each type shall comply with Section 11B-811.

**11B-225.2.1 Lockers.** Where lockers are provided, at least 5 percent, but no fewer than one of each type, shall comply with Section 11B-811.

**11B-225.2.2 Self-service shelving.** Self-service shelves shall be located on an accessible route complying with Section 11B-402. Self-service shelving shall not be required to comply with Section 11B-308.

TABLE 11B-224.2  
GUEST ROOMS WITH MOBILITY FEATURES

TOTAL NUMBER OF GUEST ROOMS PROVIDED	MINIMUM NUMBER OF REQUIRED ROOMS WITHOUT ROLL-IN SHOWERS	MINIMUM NUMBER OF REQUIRED ROOMS WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQUIRED ROOMS
1 to 25	0	1	1
26 to 50	1	1	2
51 to 75	3	1	4
76 to 100	4	1	5
101 to 150	5	2	7
151 to 200	6	2	8
201 to 300	7	3	10
301 to 400	8	4	12
401 to 500	9	4	13
501 to 1000	2 percent of total	1 percent of total	3 percent of total
1001 and over	20, plus 1 for each 100, or fraction thereof, over 1000	10, plus 1 for each 100, or fraction thereof, over 1000	30, plus 2 for each 100, or fraction thereof, over 1000

TABLE 11B-224.4  
GUEST ROOMS WITH COMMUNICATION FEATURES

TOTAL NUMBER OF GUEST ROOMS PROVIDED	MINIMUM NUMBER OF REQUIRED GUEST ROOMS WITH COMMUNICATION FEATURES
1	1
2 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1000	5 percent of total
1001 and over	50, plus 3 for each 100 over 1000

**11B-225.2.3 Library book stacks.** Book stacks available for public use shall be 54 inches (1372 mm) maximum above the finish floor.

**Exceptions:**

1. Book stacks available for public use may be higher than 54 inches (1372 mm) maximum above the finish floor when an attendant is available to assist persons with disabilities.
2. Book stacks restricted to employee use are not required to comply with these requirements.

**11B-225.3 Self-service storage facilities.** Self-service storage facilities shall provide individual self-service storage spaces complying with these requirements in accordance with Table 11B-225.3.

**TABLE 11B-225.3  
SELF-SERVICE STORAGE FACILITIES**

TOTAL SPACES IN FACILITY	MINIMUM NUMBER OF SPACES REQUIRED TO BE ACCESSIBLE
1 to 200	5 percent, but no fewer than 1
201 and over	10, plus 2 percent of total number of units over 200

**11B-225.3.1 Dispersion.** Individual self-service storage spaces shall be dispersed throughout the various classes of spaces provided. Where more classes of spaces are provided than the number required to be accessible, the number of spaces shall not be required to exceed that required by Table 11B-225.3. Self-service storage spaces complying with Table 11B-225.3 shall not be required to be dispersed among buildings in a multi-building facility.

**11B-226 Dining surfaces and work surfaces**

**11B-226.1 General.** Where dining surfaces are provided for the consumption of food or drink, at least 5 percent of the seating spaces and standing spaces at the dining surfaces shall comply with Section 11B-902. In addition, where work surfaces are provided for use by other than employees, at least 5 percent shall comply with Section 11B-902.

**Exceptions:**

1. Sales counters and service counters shall not be required to comply with Section 11B-902. See Section 11B-227.
2. Check writing surfaces provided at check-out aisles not required to comply with Section 11B-904.3 shall not be required to comply with Section 11B-902.

**11B-226.2 Dispersion.** Dining surfaces required to comply with Section 11B-902 shall be dispersed throughout the space or facility containing dining surfaces for each type of seating in a functional area. Work surfaces required to comply with Section 11B-902 shall be dispersed throughout the space or facility containing work surfaces.

**11B-226.3 Dining surfaces exceeding 34 inches in height.** Where food or drink is served for consumption at a counter exceeding 34 inches (864 mm) in height, a portion of the main counter 60 inches (1525 mm) minimum in length shall be provided in compliance with Section 11B-902.3.

**11B-226.4 Baby changing tables.** Baby changing tables shall comply with Sections 11B-309 and 11B-902. Baby changing tables when deployed shall not obstruct the required width of an accessible route except as allowed by Section 11B-307.2. Baby changing tables shall not be located in toilet compartments complying with Section 11B-604.8 within a multiple accommodation toilet facility.

**11B-227 Sales and service**

**11B-227.1 General.** Where provided, check-out aisles, sales counters, service counters, food service lines, queues, and waiting lines shall comply with Sections 11B-227 and 11B-904.

**11B-227.2 Check-out aisles.** Where check-out aisles are provided, check-out aisles complying with Section 11B-904.3 shall be provided in accordance with Table 11B-227.2. Where check-out aisles serve different functions, check-out aisles complying with Section 11B-904.3 shall be provided in accordance with Table 11B-227.2 for each function. Where check-out aisles are dispersed throughout the building or facility, check-out aisles complying with Section 11B-904.3 shall be dispersed. When not all check-out aisles are accessible, accessible check-out aisles shall be identified by a sign complying with Section 11B-904.3.4.

*Note: Operational procedures are often necessary to ensure the Americans with Disabilities Act accessibility requirements are met. When check-out aisles are open for customer use, the business should ensure that a minimum of one accessible check-out aisle is always available for use by persons with disabilities. As check-out aisles are opened and closed based on fluctuating customer levels, the business should ensure that the number of accessible check-out aisles available complies with Table 11B-227.2.*

**Exception:** In existing buildings, where the selling space is under 5000 square feet ( $465 \text{ m}^2$ ) no more than one check-out aisle complying with Section 11B-904.3 shall be required.

**TABLE 11B-227.2  
CHECK-OUT AISLES**

NUMBER OF CHECK-OUT AISLES OF EACH FUNCTION	MINIMUM NUMBER OF CHECK-OUT AISLES OF EACH FUNCTION REQUIRED TO COMPLY WITH 11B-904.3
1 to 4	1
5 to 8	2
9 to 15	3
16 and over	3, plus 20 percent of additional aisles

**11B-227.2.1 Altered check-out aisles.** Where check-out aisles are altered, at least one of each check-out aisle serving each function shall comply with Section 11B-904.3 until the number of check-out aisles complies with Section 11B-227.2.

**11B-227.3 Counters.** Where provided, at least one of each type of sales counter and service counter shall comply with Section 11B-904.4. Where counters are dispersed throughout the building or facility, counters complying with Section 11B-904.4 also shall be dispersed.

**11B-227.4 Food service lines.** Food service lines shall comply with Section 11B-904.5. Where self-service shelves are

provided, at least 50 percent, but no fewer than one, of each type provided shall comply with *Section 11B-308*.

**11B-227.5 Queues and waiting lines.** Queues and waiting lines servicing counters or check-out aisles required to comply with *Sections 11B-904.3* or *11B-904.4* shall comply with *Section 11B-403*.

#### **11B-228 Depositories, vending machines, change machines, mail boxes, and fuel dispensers**

**11B-228.1 General.** Where provided, at least one of each type of depository, vending machine, change machine, and fuel dispenser shall comply with *Section 11B-309*.

**Exception:** Drive-up only depositories shall not be required to comply with *Section 11B-309*.

**11B-228.2 Mail boxes.** Where mail boxes are provided in an interior location, at least 5 percent, but no fewer than one, of each type shall comply with *Section 11B-309*. In residential facilities, where mail boxes are provided for each residential dwelling unit, mail boxes complying with *Section 11B-309* shall be provided for each residential dwelling unit required to provide mobility features complying with *Sections 11B-809.2* through *11B-809.4* and adaptable features complying with *Chapter 11A, Division IV*.

#### **11B-229 Windows**

**11B-229.1 General.** Where glazed openings are provided in accessible rooms or spaces for operation by occupants, at least one opening shall comply with *Section 11B-309*. Each glazed opening required by an administrative authority to be operable shall comply with *Section 11B-309*.

**Exception:**

1. Glazed openings in residential dwelling units required to comply with *Section 11B-809* shall not be required to comply with *Section 11B-229*.
2. Glazed openings in guest rooms required to provide communication features and in guest rooms required to comply with *Section 11B-206.5.3* shall not be required to comply with *Section 11B-229*.

#### **11B-230 Two-way communication systems**

**11B-230.1 General.** Where a two-way communication system is provided to gain admittance to a building or facility or to restricted areas within a building or facility, the system shall comply with *Section 11B-708*.

#### **11B-231 Judicial facilities**

**11B-231.1 General.** Judicial facilities shall comply with *Section 11B-231*.

**11B-231.2 Courtrooms.** Each courtroom shall comply with *Section 11B-808*.

**11B-231.3 Holding cells.** Where provided, central holding cells and court-floor holding cells shall comply with *Section 11B-231.3*.

**11B-231.3.1 Central holding cells.** Where separate central holding cells are provided for adult male, juvenile male, adult female, or juvenile female, one of each type shall comply with *Section 11B-807.2*. Where central holding cells are provided and are not separated by age or sex,

at least one cell complying with *Section 11B-807.2* shall be provided.

**11B-231.3.2 Court-floor holding cells.** Where separate court-floor holding cells are provided for adult male, juvenile male, adult female, or juvenile female, each courtroom shall be served by one cell of each type complying with *Section 11B-807.2*. Where court-floor holding cells are provided and are not separated by age or sex, court-rooms shall be served by at least one cell complying with *Section 11B-807.2*. Cells may serve more than one courtroom.

**11B-231.4 Visiting areas.** Visiting areas shall comply with *Section 11B-231.4*.

**11B-231.4.1 Cubicles and counters.** At least 5 percent, but no fewer than one, of cubicles shall comply with *Section 11B-902* on both the visitor and detainee sides. Where counters are provided, at least one shall comply with *Section 11B-904.4.2* on both the visitor and detainee sides.

**Exception:** The detainee side of cubicles or counters at non-contact visiting areas not serving holding cells required to comply with *Section 11B-231* shall not be required to comply with *Sections 11B-902* or *11B-904.4.2*.

**11B-231.4.2 Partitions.** Where solid partitions or security glazing separate visitors from detainees at least one of each type of cubicle or counter partition shall comply with *Section 11B-904.6*.

#### **11B-232 Detention facilities and correctional facilities**

**11B-232.1 General.** Buildings, facilities, or portions thereof, in which people are detained for penal or correction purposes, or in which the liberty of the inmates is restricted for security reasons shall comply with *Section 11B-232*.

**11B-232.2 General holding cells and general housing cells.** General holding cells and general housing cells shall be provided in accordance with *Section 11B-232.2*.

**Exception: Reserved.**

**11B-232.2.1 Cells with mobility features.** At least 3 percent, but no fewer than one, of the total number of cells in a facility shall provide mobility features complying with *Section 11B-807.2*.

**11B-232.2.1.1 Beds.** In cells having more than 25 beds, at least 5 percent of the beds shall have clear floor space complying with *Section 11B-807.2.3*.

**11B-232.2.1.2 Dispersion.** Cells with mobility features shall be provided in each classification level.

**11B-232.2.1.3 Substitute cells.** When alterations are made to specific cells, detention and correctional facility operators may satisfy their obligation to provide the required number of cells with mobility features by providing the required mobility features in substitute cells (cells other than those where alterations are originally planned), provided that each substitute cell meets the following conditions:

1. Located within the same prison site.
2. Integrated with the other cells to the maximum extent feasible.

3. Has equal physical access as the altered cells to areas used by inmates or detainees for visitation, dining, recreation, educational programs, medical services, work programs, religious services, and participation in other programs that the facility offers to inmates or detainees.

**11B-232.2.1.4 Technically infeasible.** Where it is technically infeasible to locate a substitute cell within the same prison site in compliance with Section 11B-232.2.1.3, a substitute cell shall be provided at another prison site within the correctional system.

**11B-232.2 Cells with communication features.** At least 2 percent, but no fewer than one, of the total number of general holding cells and general housing cells equipped with audible emergency alarm systems and permanently installed telephones within the cell shall provide communication features complying with Section 11B-807.3.

**11B-232.3 Special holding cells and special housing cells.** Where special holding cells or special housing cells are provided, at least one cell serving each purpose shall provide mobility features complying with Section 11B-807.2. Cells subject to this requirement include, but are not limited to, those used for purposes of orientation, protective custody, administrative or disciplinary detention or segregation, detoxification, and medical isolation.

**Exception:** Reserved.

**11B-232.4 Medical care facilities.** Patient bedrooms or cells required to comply with Section 11B-223 shall be provided in addition to any medical isolation cells required to comply with Section 11B-232.3.

**11B-232.5 Visiting areas.** Visiting areas shall comply with Section 11B-232.5.

**11B-232.5.1 Cubicles and counters.** At least 5 percent, but no fewer than one, of cubicles shall comply with Section 11B-902 on both the visitor and detainee sides. Where counters are provided, at least one shall comply with Section 11B-904.4.2 on both the visitor and detainee or inmate sides.

**Exception:** The inmate or detainee side of cubicles or counters at non-contact visiting areas not serving holding cells or housing cells required to comply with Section 11B-232 shall not be required to comply with Section 11B-902 or 11B-904.4.2.

**11B-232.5.2 Partitions.** Where solid partitions or security glazing separate visitors from detainees or inmates at least one of each type of cubicle or counter partition shall comply with Section 11B-904.6.

#### 11B-233 Residential facilities

**11B-233.1 General.** Public housing facilities with residential dwelling units available for public use shall comply with Section 11B-233. See Chapter 2, Section 202 of this code for the definition of Public Housing.

#### 11B-233.2 Reserved.

**11B-233.3 Public housing facilities.** Public housing facilities with residential dwelling units shall comply with Section 11B-233.3.

**11B-233.3.1 Minimum number: new construction.** Newly constructed public housing facilities with residential dwelling units shall comply with Section 11B-233.3.1.

**Exception:** Where facilities contain 15 or fewer residential dwelling units, the requirements of Sections 11B-233.3.1.1 and 11B-233.3.1.3 shall apply to the total number of residential dwelling units that are constructed under a single contract, or are developed as a whole, whether or not located on a common site.

**11B-233.3.1.1 Residential dwelling units with mobility features.** In public housing facilities with residential dwelling units, at least 5 percent, but no fewer than one unit, of the total number of residential dwelling units shall provide mobility features complying with Sections 11B-809.2 through 11B-809.4 and shall be on an accessible route as required by Section 11B-206.

**11B-233.3.1.2 Residential dwelling units with adaptable features.** In public housing facilities with residential dwelling units, adaptable residential dwelling units complying with Chapter 11A, Division IV – Dwelling Unit Features shall be provided as required by Sections 11B-233.3.1.2.1 through 11B-233.3.1.2.5. Adaptable residential dwelling units shall be on an accessible route as required by Section 11B-206.

**Exception:** The number of required adaptable residential dwelling units shall be reduced by the number of units required by Section 11B-233.3.1.1.

**11B-233.3.1.2.1 Elevator buildings.** Residential dwelling units on floors served by an elevator shall be adaptable.

**11B-233.3.1.2.2 Non-elevator buildings.** Ground floor residential dwelling units in non-elevator buildings shall be adaptable.

**11B-233.3.1.2.3 Ground floors above grade.** Where the first floor in a building containing residential dwelling units is a floor above grade, all units on that floor shall be adaptable.

**11B-233.3.1.2.4. Multi-story residential dwelling units.** In elevator buildings, public housing facilities

with multi-story residential dwelling units shall comply with the following:

**Exception:** In non-elevator buildings, a minimum of 10 percent but not less than one of the ground floor multi-story residential dwelling units shall comply with Section 11B-233.3.1.2.4, calculated using the total number of multi-story residential dwelling units in buildings on a site.

1. The primary entry of the multi-story residential dwelling unit shall be on an accessible route. In buildings with elevators the primary entry shall be on the floor served by the elevator.
2. At least one powder room or bathroom shall be located on the primary entry level.
3. Rooms or spaces located on the primary entry level shall be served by an accessible route and comply with Chapter 11A, Division IV – Dwelling Unit Features.

**11B-233.3.1.2.5 Public housing facility site impracticality.** The number of adaptable residential dwelling units required in non-elevator building public housing facilities shall be determined in accordance with Chapter 11A, Section 1150A.1. The remaining ground floor residential dwelling units shall comply with the following requirements:

1. Grab bar reinforcement complying with Section 11B-609.
2. Doors complying with Section 11B-404.
3. Communication features complying with Section 11B-809.5.5.
4. Electrical receptacle and switches complying with Section 11B-308.1.
5. Toilet and bathing facilities complying with Section 11B-809.4.
6. Kitchen sink removable cabinets complying with Section 11B-606.2, Exception 3.

**11B-233.3.1.3 Residential dwelling units with communication features.** In public housing facilities with residential dwelling units, at least 2 percent, but no fewer than one unit, of the total number of residential dwelling units shall provide communication features complying with Section 11B-809.5.

**11B-233.3.2 Residential dwelling units for sale.** Residential dwelling units designed and constructed or altered by public entities that will be offered for sale to individuals shall provide accessible features to the extent required by this chapter.

**Exception:** Existing residential dwellings or residential dwelling units acquired by public entities that will be offered for resale to individuals without additions or alterations shall not be required to comply with this chapter.

**11B-233.3.3 Additions.** Where an addition to an existing public housing facility results in an increase in the number

of residential dwelling units, the requirements of Section 11B-233.3.1 shall apply only to the residential dwelling units that are added until the total number of residential dwelling units complies with the minimum number required by Section 11B-233.3.1. Residential dwelling units required to comply with Sections 11B-233.3.1.1 and 11B-233.3.1.2 shall be on an accessible route as required by Section 11B-206.

**11B-233.3.4 Alterations.** Alterations to a public housing facility shall comply with Section 11B-233.3.4.

**Exception:** Where compliance with Sections 11B-809.2, 11B-809.3, or 11B-809.4 is technically infeasible, or where it is technically infeasible to provide an accessible route to a residential dwelling unit, the entity shall be permitted to alter or construct a comparable residential dwelling unit to comply with Sections 11B-809.2 through 11B-809.4 provided that the minimum number of residential dwelling units required by Sections 11B-233.3.1.1, 11B-233.3.1.2 and 11B-233.3.1.3, as applicable, is satisfied.

**11B-233.3.4.1 Alterations to vacated buildings.** Where a building is vacated for the purposes of alteration for use as public housing, and the altered building contains more than 15 residential dwelling units, at least 5 percent of the residential dwelling units shall comply with Sections 11B-809.2 through 11B-809.4 and shall be on an accessible route as required by Section 11B-206. Residential dwelling units with adaptable features shall be provided in compliance with Section 11B-233.3.1.2. In addition, at least 2 percent of the residential dwelling units shall comply with Section 11B-809.5.

**Exception:** Where any portion of a building's exterior is preserved, but the interior of the building is removed, including all structural portions of floors and ceilings and a new building intended for use as public housing is constructed behind the existing exterior, the building is considered a new building for determining the application of this chapter.

**11B-233.3.4.2 Alterations to individual residential dwelling units.** In public housing facilities with individual residential dwelling units, where a bathroom or a kitchen is substantially altered, and at least one other room is altered, the requirements of Section 11B-233.3.1 shall apply to the altered residential dwelling units until the total number of residential dwelling units complies with the minimum number required by Sections 11B-233.3.1.1, 11B-233.3.1.2, and 11B-233.3.1.3. Residential dwelling units required to comply with Sections 11B-233.3.1.1 and 11B-233.3.1.2 shall be on an accessible route as required by Section 11B-206.

**Exception:** Where public housing facilities contain 15 or fewer residential dwelling units, the requirements of Sections 11B-233.3.1.1, 11B-233.3.1.2, and 11B-233.3.1.3, shall apply to the total number of residential dwelling units that are altered under a single contract, or are developed as a whole, whether or not located on a common site.

**11B-233.3.5 Dispersion.** In public housing facilities, residential dwelling units required to provide mobility features complying with Sections 11B-809.2 through 11B-809.4 and residential dwelling units required to provide communication features complying with Section 11B-809.5, and adaptable features complying with Chapter 11A, Division IV shall be dispersed among the various types of residential dwelling units in the facility and shall provide choices of residential dwelling units comparable to, and integrated with, those available to other residents.

**Exception:** In public housing facilities where multi-story residential dwelling units are one of the types of residential dwelling units provided, one-story residential dwelling units shall be permitted as a substitute for multi-story residential dwelling units where equivalent spaces and amenities are provided in the one-story residential dwelling unit.

**11B-233.3.6 Graduate student and faculty housing at a place of education.** Housing facilities that are provided by or on behalf of a place of education, with residential dwelling units leased on a year-round basis exclusively to graduate students or faculty, and that do not contain any public use or common use areas available for educational programming, are not subject to Section 11B-224 and shall comply with Section 11B-233.

#### 11B-234 Amusement rides

**11B-234.1 General.** Amusement rides shall comply with Section 11B-234.

**Exception:** Mobile or portable amusement rides shall not be required to comply with Section 11B-234.

**11B-234.2 Load and unload areas.** Load and unload areas serving amusement rides shall comply with Section 11B-1002.3.

**11B-234.3 Minimum number.** Amusement rides shall provide at least one wheelchair space complying with Section 11B-1002.4, or at least one amusement ride seat designed for

transfer complying with Section 11B-1002.5, or at least one transfer device complying with Section 11B-1002.6.

#### Exceptions:

1. Amusement rides that are controlled or operated by the rider shall not be required to comply with Section 11B-234.3.
2. Amusement rides designed primarily for children, where children are assisted on and off the ride by an adult, shall not be required to comply with Section 11B-234.3.
3. Amusement rides that do not provide amusement ride seats shall not be required to comply with Section 11B-234.3.

**11B-234.4 Existing amusement rides.** Where existing amusement rides are altered, the alteration shall comply with Section 11B-234.4.

**11B-234.4.1 Load and unload areas.** Where load and unload areas serving existing amusement rides are newly designed and constructed, the load and unload areas shall comply with Section 11B-1002.3.

**11B-234.4.2 Minimum number.** Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with Section 11B-234.3.

#### 11B-235 Recreational boating facilities

**11B-235.1 General.** Recreational boating facilities shall comply with Section 11B-235.

**11B-235.2 Boat slips.** Boat slips complying with Section 11B-1003.3.1 shall be provided in accordance with Table 11B-235.2. Where the number of boat slips is not identified, each 40 feet (12192 mm) of boat slip edge provided along the perimeter of the pier shall be counted as one boat slip for the purpose of this section.

TABLE 11B-235.2  
BOAT SLIPS

TOTAL NUMBER OF BOAT SLIPS PROVIDED IN FACILITY	MINIMUM NUMBER OF REQUIRED ACCESSIBLE BOAT SLIPS
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
801 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for every 100, or fraction thereof, over 1000

**11B-235.2.1 Dispersion.** Boat slips complying with *Section 11B-1003.3.1* shall be dispersed throughout the various types of boat slips provided. Where the minimum number of boat slips required to comply with *Section 11B-1003.3.1* has been met, no further dispersion shall be required.

**11B-235.3 Boarding piers at boat launch ramps.** Where boarding piers are provided at boat launch ramps, at least 5 percent, but no fewer than one, of the boarding piers shall comply with *Section 11B-1003.3.2*.

#### **11B-236 Exercise machines and equipment**

**11B-236.1 General.** At least one of each type of exercise machine and equipment shall comply with *Section 11B-1004*.

#### **11B-237 Fishing piers and platforms**

**11B-237.1 General.** Fishing piers and platforms shall comply with *Section 11B-1005*.

#### **11B-238 Golf facilities**

**11B-238.1 General.** Golf facilities shall comply with *Section 11B-238*.

**11B-238.2 Golf courses.** Golf courses shall comply with *Section 11B-238.2*.

**11B-238.2.1 Teeing grounds.** Where one teeing ground is provided for a hole, the teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where two teeing grounds are provided for a hole, the forward teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where three or more teeing grounds are provided for a hole, at least two teeing grounds, including the forward teeing ground, shall be designed and constructed so that a golf car can enter and exit each teeing ground.

**Exception:** In existing golf courses, the forward teeing ground shall not be required to be one of the teeing grounds on a hole designed and constructed so that a golf car can enter and exit the teeing ground where compliance is not feasible due to terrain.

**11B-238.2.2 Putting greens.** Putting greens shall be designed and constructed so that a golf car can enter and exit the putting green.

**11B-238.2.3 Weather shelters.** Where provided, weather shelters shall be designed and constructed so that a golf car can enter and exit the weather shelter and shall comply with *Section 11B-1006.4*.

**11B-238.3 Practice putting greens, practice teeing grounds, and teeing stations at driving ranges.** At least 5 percent, but no fewer than one, of practice putting greens, practice teeing grounds, and teeing stations at driving ranges shall be designed and constructed so that a golf car can enter and exit the practice putting greens, practice teeing grounds, and teeing stations at driving ranges.

#### **11B-239 Miniature golf facilities**

**11B-239.1 General.** Miniature golf facilities shall comply with *Section 11B-239*.

**11B-239.2 Minimum number.** At least 50 percent of holes on miniature golf courses shall comply with *Section 11B-1007.3*.

**11B-239.3 Miniature golf course configuration.** Miniature golf courses shall be configured so that the holes complying with *Section 11B-1007.3* are consecutive. Miniature golf courses shall provide an accessible route from the last hole complying with *Section 11B-1007.3* to the course entrance or exit without requiring travel through any other holes on the course.

**Exception:** One break in the sequence of consecutive holes shall be permitted provided that the last hole on the miniature golf course is the last hole in the sequence.

#### **11B-240 Play areas**

**11B-240.1 General.** Play areas for children ages 2 and over shall comply with *Section 11B-240*. Where separate play areas are provided within a site for specific age groups, each play area shall comply with *Section 11B-240*.

##### **Exceptions:**

1. Play areas located in family child care facilities where the proprietor actually resides shall not be required to comply with *Section 11B-240*.
2. In existing play areas, where play components are relocated for the purposes of creating safe use zones and the ground surface is not altered or extended for more than one use zone, the play area shall not be required to comply with *Section 11B-240*.
3. Amusement attractions shall not be required to comply with *Section 11B-240*.
4. Where play components are altered and the ground surface is not altered, the ground surface shall not be required to comply with *Section 11B-1008.2.6* unless required by *Section 11B-202.4*.

**11B-240.1.1 Additions.** Where play areas are designed and constructed in phases, the requirements of *Section 11B-240* shall apply to each successive addition so that when the addition is completed, the entire play area complies with all the applicable requirements of *Section 11B-240*.

**11B-240.2 Play components.** Where provided, play components shall comply with *Section 11B-240.2*.

**11B-240.2.1 Ground level play components.** Ground level play components shall be provided in the number and types required by *Section 11B-240.2.1*. Ground level play components that are provided to comply with *Section 11B-240.2.1.1* shall be permitted to satisfy the additional number required by *Section 11B-240.2.1.2* if the minimum required types of play components are satisfied. Where two or more required ground level play components are provided, they shall be dispersed throughout the play area and integrated with other play components.

**11B-240.2.1.1 Minimum number and types.** Where ground level play components are provided, at least one of each type shall be on an accessible route and shall comply with *Section 11B-1008.4*.

**11B-240.2.1.2 Additional number and types.** Where elevated play components are provided, ground level play components shall be provided in accordance with Table 11B-240.2.1.2 and shall comply with Section 11B-1008.4.

**Exception:** If at least 50 percent of the elevated play components are connected by a ramp and at least 3 of the elevated play components connected by the ramp are different types of play components, the play area shall not be required to comply with Section 11B-240.2.1.2.

**11B-240.2.2 Elevated play components.** Where elevated play components are provided, at least 50 percent shall be on an accessible route and shall comply with Section 11B-1008.4.

#### 11B-241 Saunas and steam rooms

**11B-241.1 General.** Where provided, saunas and steam rooms shall comply with Section 11B-612.

**Exception:** Where saunas or steam rooms are clustered at a single location, no more than 5 percent of the saunas and steam rooms, but no fewer than one, of each type in each cluster shall be required to comply with Section 11B-612.

#### 11B-242 Swimming pools, wading pools, and spas

**11B-242.1 General.** Swimming pools, wading pools, and spas shall comply with Section 11B-242.

**11B-242.2 Swimming Pools.** At least two accessible means of entry shall be provided for swimming pools. Accessible means of entry shall be swimming pool lifts complying with Section 11B-1009.2; sloped entries complying with Section 11B-1009.3; transfer walls complying with Section 11B-1009.4; transfer systems complying with Section 11B-1009.5; and pool stairs complying with Section 11B-1009.6. At least one accessible means of entry provided shall comply with Sections 11B-1009.2 or 11B-1009.3.

##### Exceptions:

- Where a swimming pool has less than 300 linear feet (91 m) of swimming pool wall, no more than one

accessible means of entry shall be required provided that the accessible means of entry is a swimming pool lift complying with Section 11B-1009.2 or a sloped entry complying with Section 11B-1009.3.

- Wave action pools, leisure rivers, sand bottom pools, and other pools where user access is limited to one area shall not be required to provide more than one accessible means of entry provided that the accessible means of entry is a swimming pool lift complying with Section 11B-1009.2, a sloped entry complying with Section 11B-1009.3, or a transfer system complying with Section 11B-1009.5.
- Catch pools shall not be required to provide an accessible means of entry provided that the catch pool edge is on an accessible route.

**11B-242.3 Wading pools.** At least one accessible means of entry shall be provided for wading pools. Accessible means of entry shall comply with sloped entries complying with Section 11B-1009.3.

**11B-242.4 Spas.** At least one accessible means of entry shall be provided for spas. Accessible means of entry shall comply with swimming pool lifts complying with Section 11B-1009.2; transfer walls complying with Section 11B-1009.4; or transfer systems complying with Section 11B-1009.5.

**Exception:** Where spas are provided in a cluster, no more than 5 percent, but no fewer than one, spa in each cluster shall be required to comply with Section 11B-242.4.

#### 11B-243 Shooting facilities with firing positions

**11B-243.1 General.** Where shooting facilities with firing positions are designed and constructed at a site, at least 5 percent, but no fewer than one, of each type of firing position shall comply with Section 11B-1010.

#### 11B-244 Religious facilities

**11B-244.1 General.** Religious facilities shall be accessible in accordance with the provisions of this code. Where specific areas within religious facilities contain more than one use, each portion shall comply with the applicable requirements for that use.

**TABLE 11B-240.2.1.2  
NUMBER AND TYPES OF GROUND LEVEL PLAY COMPONENTS REQUIRED TO BE ON ACCESSIBLE ROUTES**

NUMBER OF ELEVATED PLAY COMPONENTS PROVIDED	MINIMUM NUMBER OF GROUND LEVEL PLAY COMPONENTS REQUIRED TO BE ON AN ACCESSIBLE ROUTE	MINIMUM NUMBER OF DIFFERENT TYPES OF GROUNDLEVEL PLAY COMPONENTS REQUIRED TO BE ON AN ACCESSIBLE ROUTE
1	Not applicable	Not applicable
2 to 4	1	1
5 to 7	2	2
8 to 10	3	3
11 to 13	4	3
14 to 16	5	3
17 to 19	6	3
20 to 22	7	4
23 to 25	8	4
26 and over	8, plus 1 for each additional 3, or fraction thereof, over 25	5

**11B-245 Commercial facilities located in private residences**

**11B-245.1 General.** Commercial facilities located in private residences shall comply with Section 11B-245.

**11B-245.2 Application.** When a commercial facility is located in a private residence, that portion used exclusively in the operation of the commercial facility or that portion used both for the commercial facility and for residential purposes is covered by the new construction and alterations requirements of this chapter.

**Exception:** The portion of the residence used exclusively as a residence is not required to be accessible in accordance with this chapter.

**11B-245.3 Accessible elements required.** The accessible portion of the residence extends to those elements used to enter the commercial facility, including the front sidewalk, if any, the door or entryway, and hallways; and those portions of the residence, interior or exterior, available to or used by employees or visitors of the commercial facility, including restrooms.

**11B-246 Outdoor developed areas**

**11B-246.1 General.** Outdoor developed areas shall comply with Section 11B-246.

**Exceptions:**

1. Where the enforcing agency finds that, in specific areas, the natural environment would be materially damaged by compliance with these regulations, such areas shall be subject to these regulations only to the extent that such material damage would not occur.
2. Automobile access or accessible routes are not required when the enforcing agency determines compliance with this chapter would create an unreasonable hardship as defined in Chapter 2, Section 202.

**11B-246.2 Camping facilities.** In camping facilities where campsites are provided, at least two campsites and one additional campsite for each 100 campsites or fraction thereof, shall be accessed by and connected to sanitary facilities by travel routes with a maximum slope of 1:12. Permanent toilet and bathing facilities serving campsites shall comply with Section 11B-603.

**11B-246.3 Beaches.** Beaches shall be accessible.

**11B-246.4 Day use areas and vista points.** Day use areas, vista points, and similar areas shall be accessible.

**11B-246.5 Picnic areas.** Where picnic tables are provided, at least one picnic table, and one additional table for each 20 tables or fraction thereof, shall be accessible and comply with Section 11B-902.

**11B-246.6 Parking lots.** Parking lots shall comply with Sections 11B-208 and 11B-502 and shall be provided with curb cuts leading to adjacent walks, paths or trails.

**11B-246.7 Trails and paths.** Trails, paths and nature walk areas, or portions of them, shall be constructed with gradients permitting at least partial use by wheelchair occupants.

Buildings and other functional areas shall be served by paths or walks with firm and stable surfaces.

**11B-246.8 Nature trails.** Nature trails and similar educational and informational areas shall be accessible to individuals with vision impairments by the provision of rope guidelines, raised Arabic numerals and symbols, or other similar guide and assistance devices.

**11B-247 Detectable warnings and detectable directional texture****11B-247.1 Detectable warnings.**

**11B-247.1.1 General.** Detectable warnings shall be provided in accordance with Section 11B-247.1 and shall comply with Section 11B-705.1.

**11B-247.1.2 Where required.** Detectable warnings shall be provided where required by Section 11B-247.1.2.

**11B-247.1.2.1 Platform edges.** Platform boarding edges shall have detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.1.

**11B-247.1.2.2 Curb ramps.** Curb ramps shall have detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.2.

**11B-247.1.2.3 Islands or cut-through medians.** Islands or cut-through medians shall have detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.3.

**11B-247.1.2.4 Bus stops.** Where detectable warnings are provided at bus stop boarding and alighting areas in compliance with Section 11B-810.2.3, detectable warnings shall comply with Sections 11B-705.1.1 and 11B-705.1.2.4.

**11B-247.1.2.5 Hazardous vehicular areas.** If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning complying with Sections 11B-705.1.1 and 11B-705.1.2.5.

**11B-247.1.2.6 Reflecting pools.** The edges of reflecting pools shall be protected by railings, walls, warning curbs or detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.6.

**11B-247.1.2.7 Track crossings.** Where it is necessary to cross tracks to reach transit boarding platforms, detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.7 shall be provided.

**11B-247.2 Detectable directional texture.** At transit boarding platforms, the pedestrian access shall be identified with a detectable directional texture complying with Section 11B-705.2.

## DIVISION 3: BUILDING BLOCKS

### **11B-301 General**

**11B-301.1 Scope.** The provisions of *Division 3* shall apply where required by *Division 2* or where referenced by a requirement in this *chapter*.

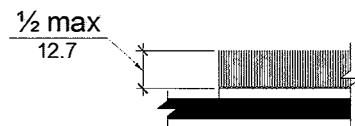
### **11B-302 Floor or ground surfaces**

**11B-302.1 General.** Floor and ground surfaces shall be stable, firm, and slip resistant and shall comply with *Section 11B-302*.

#### **Exceptions:**

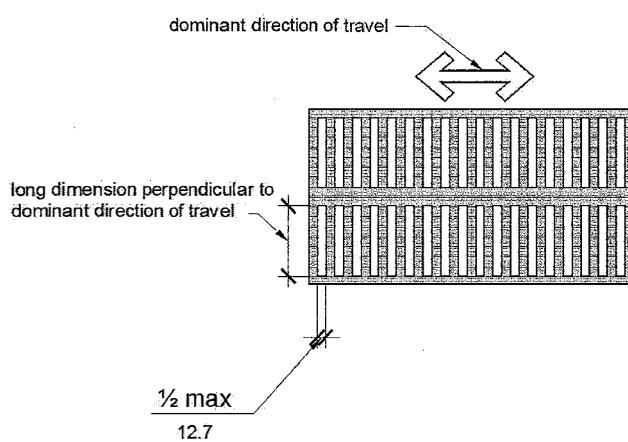
1. Within animal containment areas, floor and ground surfaces shall not be required to be stable, firm, and slip resistant.
2. Areas of sport activity shall not be required to comply with *Section 11B-302*.

**11B-302.2 Carpet.** Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, level cut/uncut pile texture. Pile height shall be  $\frac{1}{2}$  inch (12.7 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed edge. Carpet edge trim shall comply with *Section 11B-303*.



**FIGURE 11B-302.2  
CARPET PILE HEIGHT**

**11B-302.3 Openings.** Openings in floor or ground surfaces shall not allow passage of a sphere more than  $\frac{1}{2}$  inch (12.7 mm) diameter except as allowed in *Sections 11B-407.4.3, 11B-409.4.3, 11B-410.4, 11B-810.5.3 and 11B-810.10*. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.



**FIGURE 11B-302.3  
ELONGATED OPENINGS IN FLOOR OR GROUND SURFACES**

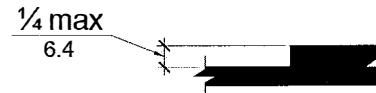
### **11B-303 Changes in level**

**11B-303.1 General.** Where changes in level are permitted in floor or ground surfaces, they shall comply with *Section 11B-303*.

#### **Exceptions:**

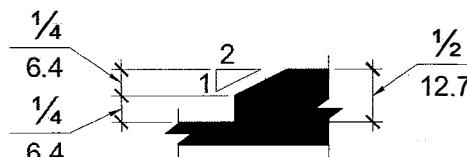
1. Animal containment areas shall not be required to comply with *Section 11B-303*.
2. Areas of sport activity shall not be required to comply with *Section 11B-303*.

**11B-303.2 Vertical.** Changes in level of  $\frac{1}{4}$  inch (6.4 mm) high maximum shall be permitted to be vertical *and without edge treatment*.



**FIGURE 11B-303.2  
VERTICAL CHANGE IN LEVEL**

**11B-303.3 Beveled.** Changes in level between  $\frac{1}{4}$  inch (6.4 mm) high minimum and  $\frac{1}{2}$  inch (12.7 mm) high maximum shall be beveled with a slope not steeper than 1:2.



**FIGURE 11B-303.3  
BEVELED CHANGE IN LEVEL**

**11B-303.4 Ramps.** Changes in level greater than  $\frac{1}{2}$  inch (12.7 mm) high shall be ramped, and shall comply with *Section 11B-405* or *11B-406*.

**11B-303.5 Warning curbs.** Abrupt changes in level exceeding 4 inches (102 mm) in a vertical dimension between walks, sidewalks or other pedestrian ways and adjacent surfaces or features shall be identified by warning curbs at least 6 inches (152 mm) in height above the walk or sidewalk surface.

#### **Exceptions:**

1. A warning curb is not required between a walk or sidewalk and an adjacent street or driveway.
2. A warning curb is not required when a guard or handrail is provided with a guide rail centered 2 inches (51 mm) minimum and 4 inches (102 mm) maximum above the surface of the walk or sidewalk.

### **11B-304 Turning space**

**11B-304.1 General.** Turning space shall comply with *Section 11B-304*.

**11B-304.2 Floor or ground surfaces.** Floor or ground surfaces of a turning space shall comply with *Section 11B-302*. Changes in level are not permitted.

**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-304.3 Size.** Turning space shall comply with *Section 11B-304.3.1* or *11B-304.3.2*.

**11B-304.3.1 Circular space.** The turning space shall be a space of 60 inches (1524 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with *Section 11B-306*.

**11B-304.3.2 T-Shaped space.** The turning space shall be a T-shaped space within a 60 inch (1524 mm) square minimum with arms and base 36 inches (914 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with *Section 11B-306* only at the end of either the base or one arm.

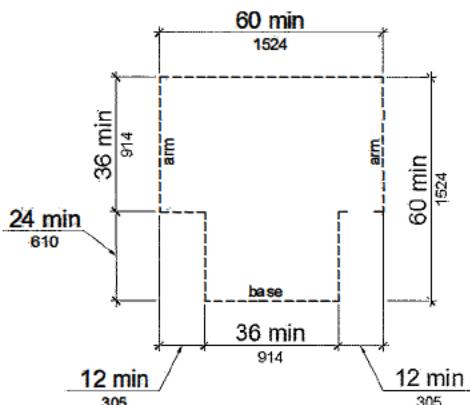


FIGURE 11B-304.3.2  
T-SHAPED TURNING SPACE

**11B-304.4 Door swing.** Doors shall be permitted to swing into turning spaces.

#### 11B-305 Clear floor or ground space

**11B-305.1 General.** Clear floor or ground space shall comply with *Section 11B-305*.

**11B-305.2 Floor or ground surfaces.** Floor or ground surfaces of a clear floor or ground space shall comply with *Section 11B-302*. Changes in level are not permitted.

**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-305.3 Size.** The clear floor or ground space shall be 30 inches (762 mm) minimum by 48 inches (1219 mm) minimum.

**11B-305.4 Knee and toe clearance.** Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with *Section 11B-306*.

**11B-305.5 Position.** Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

**11B-305.6 Approach.** One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space. *Clear floor or*

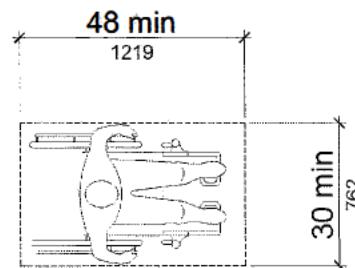


FIGURE 11B-305.3  
CLEAR FLOOR OR GROUND SPACE

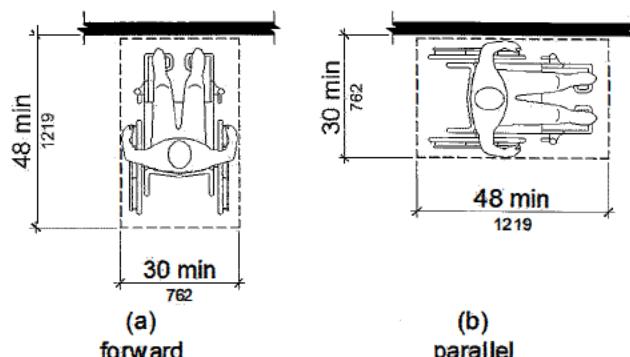


FIGURE 11B-305.5  
POSITION OF CLEAR FLOOR OR GROUND SPACE

*ground space may overlap an accessible route, unless specifically prohibited elsewhere in this chapter.*

**11B-305.7 Maneuvering clearance.** Where a clear floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided in accordance with *Sections 11B-305.7.1* and *11B-305.7.2*.

**11B-305.7.1 Forward approach.** Alcoves shall be 36 inches (914 mm) wide minimum where the depth exceeds 24 inches (610 mm).

**11B-305.7.2 Parallel approach.** Alcoves shall be 60 inches (1524 mm) wide minimum where the depth exceeds 15 inches (381 mm).

#### 11B-306 Knee and toe clearance

**11B-306.1 General.** Where space beneath an element is included as part of clear floor or ground space or turning space, the space shall comply with *Section 11B-306*. Addi-

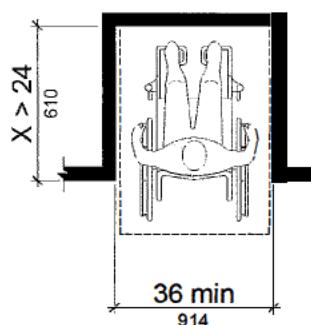
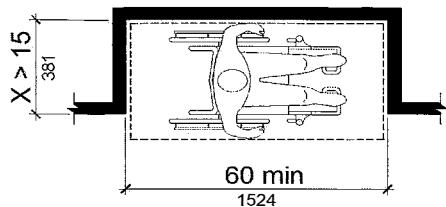


FIGURE 11B-305.7.1  
MANEUVERING CLEARANCE IN AN  
ALCOVE, FORWARD APPROACH



**FIGURE 11B-305.7.2  
MANEUVERING CLEARANCE IN  
AN ALCOVE, PARALLEL APPROACH**

tional space shall not be prohibited beneath an element but shall not be considered as part of the clear floor or ground space or turning space.

#### 11B-306.2 Toe clearance

**11B-306.2.1 General.** Space under an element between the finish floor or ground and 9 inches (229 mm) above the finish floor or ground shall be considered toe clearance and shall comply with Section 11B-306.2.

**11B-306.2.2 Maximum depth.** Toe clearance shall extend 25 inches (635 mm) maximum under an element.

**Exception:** Toe clearance shall extend 19 inches (483 mm) maximum under lavatories required to be accessible by Section 11B-213.3.4.

**11B-306.2.3 Minimum required depth.** Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (432 mm) minimum under the element.

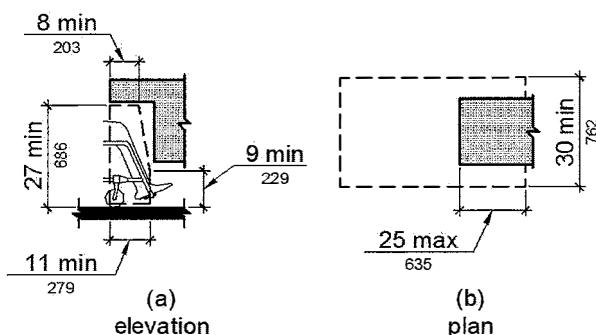
**Exceptions:**

1. The toe clearance shall extend 19 inches (483 mm) minimum under sinks required to be accessible by Section 11B-212.3.
2. The toe clearance shall extend 19 inches (483 mm) minimum under built-in dining and work surfaces required to be accessible by Section 11B-226.1.

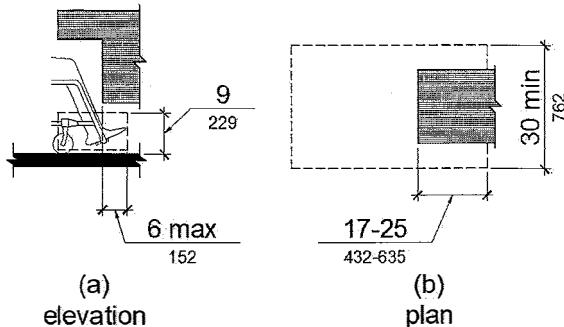
**11B-306.2.4 Additional clearance.** Space extending greater than 6 inches (152 mm) beyond the available knee clearance at 9 inches (229 mm) above the finish floor or ground shall not be considered toe clearance.

**11B-306.2.5 Width.** Toe clearance shall be 30 inches (762 mm) wide minimum.

#### 11B-306.3 Knee clearance.



**FIGURE 11B-306.3  
KNEE CLEARANCE**



**FIGURE 11B-306.2  
TOE CLEARANCE**

**11B-306.3.1 General.** Space under an element between 9 inches (229 mm) and 27 inches (686 mm) above the finish floor or ground shall be considered knee clearance and shall comply with Section 11B-306.3.

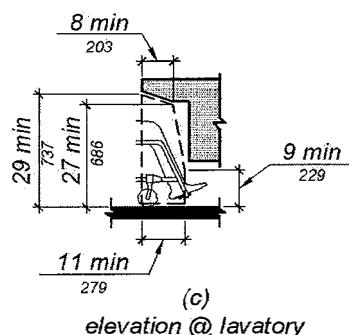
**Exception:** At lavatories required to be accessible by Section 11B-213.3.4, space between 9 inches (229 mm) and 29 inches (737 mm) above the finish floor or ground, shall be considered knee clearance.

**11B-306.3.2 Maximum depth.** Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (229 mm) above the finish floor or ground.

**11B-306.3.3 Minimum required depth.** Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (279 mm) deep minimum at 9 inches (229 mm) above the finish floor or ground, and 8 inches (203 mm) deep minimum at 27 inches (686 mm) above the finish floor or ground.

**Exceptions:**

1. At lavatories required to be accessible by Section 11B-213.3.4, the knee clearance shall be 27 inches (686 mm) high minimum above the finish floor or ground at a depth of 8 inches (203 mm) minimum increasing to 29 inches (737 mm) high minimum above the finish floor or ground at the front edge of a counter with a built-in lavatory or at the front edge of a wall-mounted lavatory fixture.
2. At dining and work surfaces required to be accessible by Section 11B-226.1, knee clearance shall extend 19 inches (483 mm) deep minimum at 27 inches (686 mm) above the finish floor or ground.



**11B-306.3.4 Clearance reduction.** Between 9 inches (229 mm) and 27 inches (686 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (152 mm) in height.

**Exception:** The knee clearance shall not be reduced at built-in dining and work surfaces required to be accessible by Section 11B-226.1.

**11B-306.3.5 Width.** Knee clearance shall be 30 inches (762 mm) wide minimum.

#### 11B-307 Protruding objects

**11B-307.1 General.** Protruding objects shall comply with Section 11B-307.

**11B-307.2 Protrusion limits.** Objects with leading edges more than 27 inches (686 mm) and not more than 80 inches (2032 mm) above the finish floor or ground shall protrude 4 inches (102 mm) maximum horizontally into the circulation path.

**Exception:** Handrails shall be permitted to protrude 4½ inches (114 mm) maximum.

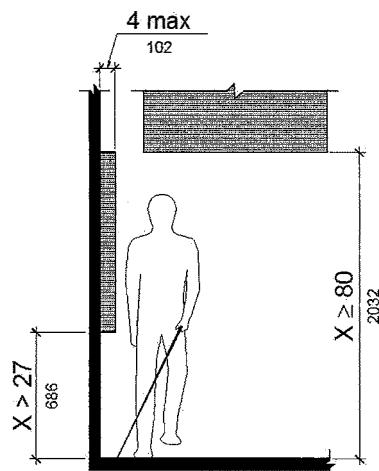


FIGURE 11B-307.2  
LIMITS OF PROTRUDING OBJECTS

**11B-307.3 Post-mounted objects.** Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (686 mm) minimum and 80 inches (2032 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (686 mm) maximum or 80 inches (2032 mm) minimum above the finish floor or ground.

**Exception:** The sloping portions of handrails serving stairs and ramps shall not be required to comply with Section 11B-307.3.

**11B-307.3.1 Edges and corners.** Where signs or other objects are mounted on posts or pylons, and their bottom edges are less than 80 inches (2032 mm) above the floor or ground surface, the edges of such signs and objects shall be rounded or eased and the corners shall have a minimum radius of  $\frac{1}{8}$  inch (3.2 mm).

**11B-307.4 Vertical clearance.** Vertical clearance shall be 80 inches (2032 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2032 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (686 mm) maximum above the finish floor or ground.

**Exception:** Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the finish floor or ground.

**11B-307.4.1 Guy braces.** Where a guy support is used within either the width of a circulation path or 24 inches (610 mm) maximum outside of a circulation path, a vertical guy brace, sidewalk guy or similar device shall be used to prevent a hazard or an overhead obstruction.

**11B-307.5 Required clear width.** Protruding objects shall not reduce the clear width required for accessible routes.

#### 11B-308 Reach ranges

**11B-308.1 General.** Reach ranges shall comply with Section 11B-308.

**11B-308.1.1 Electrical switches.** Controls and switches intended to be used by the occupant of a room or area to

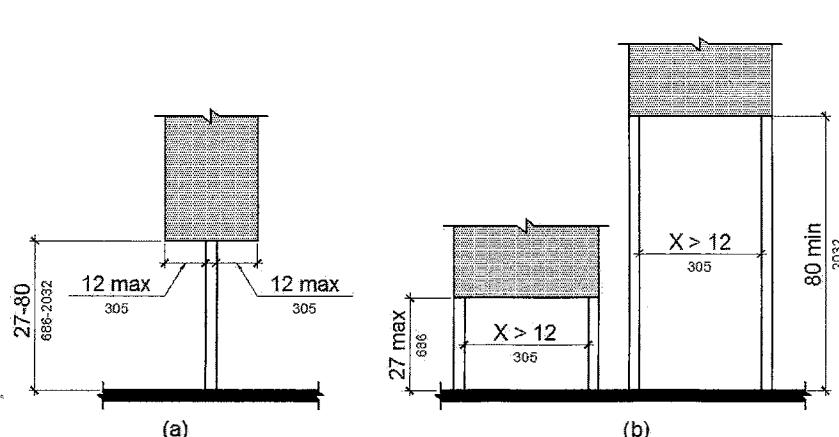
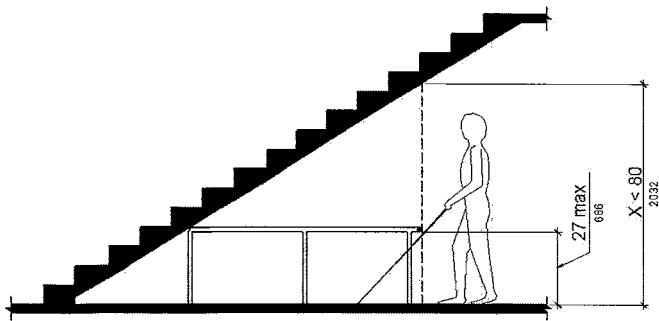
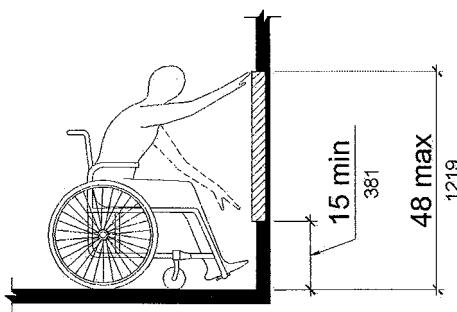


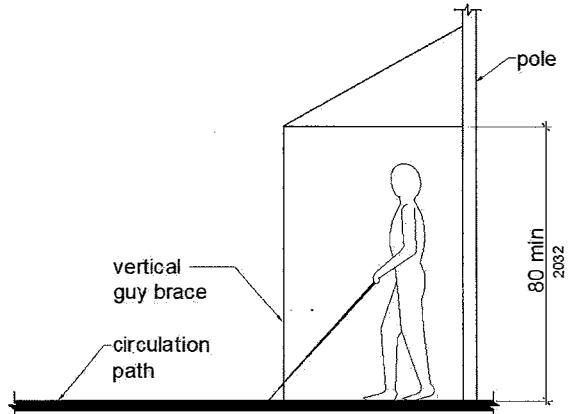
FIGURE 11B-307.3  
POST-MOUNTED PROTRUDING OBJECTS



**FIGURE 11B-307.4  
VERTICAL CLEARANCE**



**FIGURE 11B-308.2.1  
UNOBSTRUCTED FORWARD REACH**



**FIGURE 11B-307.4.1  
GUY BRACES**

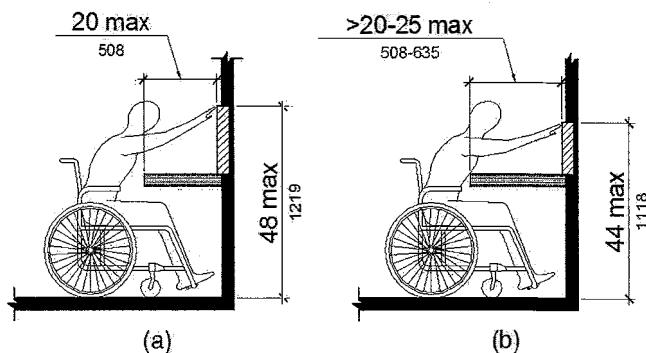
control lighting and receptacle outlets, appliances or cooling, heating and ventilating equipment, shall comply with Section 11B-308 except the low reach shall be measured to the bottom of the outlet box and the high reach shall be measured to the top of the outlet box.

**11B-308.1.2 Electrical receptacle outlets.** Electrical receptacle outlets on branch circuits of 30 amperes or less and communication system receptacles shall comply with Section 11B-308 except the low reach shall be measured to the bottom of the outlet box and the high reach shall be measured to the top of the outlet box.

#### 11B-308.2 Forward reach.

**11B-308.2.1 Unobstructed.** Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1219 mm) maximum and the low forward reach shall be 15 inches (381 mm) minimum above the finish floor or ground.

**11B-308.2.2 Obstructed high reach.** Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1219 mm) maximum where the reach depth is 20 inches (508 mm) maximum. Where the reach depth exceeds 20 inches (508 mm), the high forward reach shall be 44 inches (1118 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.



**FIGURE 11B-308.2.2  
OBSTRUCTED HIGH FORWARD REACH**

#### 11B-308.3 Side reach.

**11B-308.3.1 Unobstructed.** Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1219 mm) maximum and the low side reach shall be 15 inches (381 mm) minimum above the finish floor or ground.

##### Exceptions:

1. An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 10 inches (254 mm) maximum.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1372 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

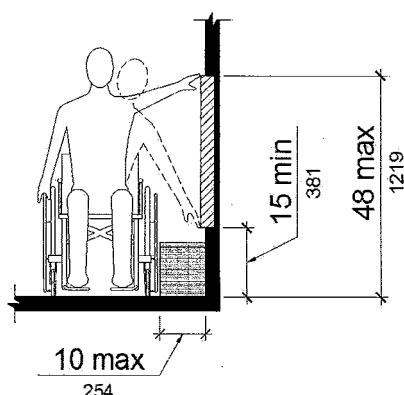
**11B-308.3.2 Obstructed high reach.** Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (864 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1219 mm) maximum for a reach depth of 10 inches (254 mm) maximum. Where the reach depth exceeds 10 inches (254 mm), the high side reach shall be 46 inches (1168 mm) maximum.

maximum for a reach depth of 24 inches (610 mm) maximum.

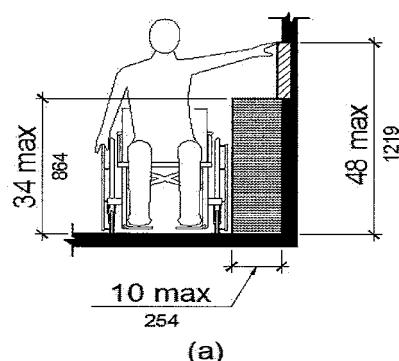
**Exceptions:**

1. The top of washing machines and clothes dryers shall be permitted to be 36 inches (914 mm) maximum above the finish floor.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1372 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

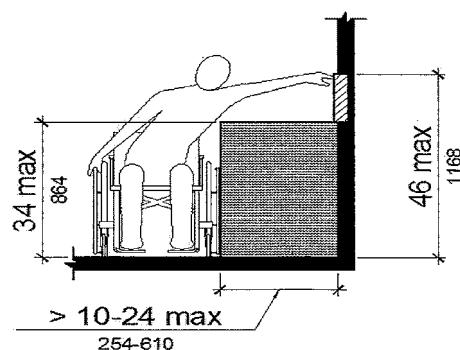
**11B-308.4 Suggested reach ranges for children.** Where building elements such as coat hooks, lockers, or operable parts are designed for use primarily by children, the suggested dimensions of Table 11B-308.4 shall be permitted. These dimensions apply to either forward or side reaches.



**FIGURE 11B-308.3.1  
UNOBSTRUCTED SIDE REACH**



(a)



(b)

**FIGURE 11B-308.3.2  
OBSTRUCTED HIGH SIDE REACH**

**TABLE 11B-308.4  
SUGGESTED DIMENSIONS FOR CHILDREN'S USE**

SUGGESTED REACH RANGES FOR CHILDREN AGES 3 THROUGH 12			
Forward or Side Reach	Ages 3 and 4	Ages 5 through 8	Ages 9 through 12
High (maximum)	36 inches (914 mm)	40 inches (1016 mm)	44 inches (1118 mm)
Low (minimum)	20 inches (508 mm)	18 inches (457 mm)	16 inches (406 mm)

**11B-309 Operable parts**

**11B-309.1 General.** Operable parts shall comply with Section 11B-309.

**11B-309.2 Clear floor space.** A clear floor or ground space complying with Section 11B-305 shall be provided.

**11B-309.3 Height.** Operable parts shall be placed within one or more of the reach ranges specified in Section 11B-308.

**11B-309.4 Operation.** Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

**Exception:** Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

## DIVISION 4: ACCESSIBLE ROUTES

### **11B-401 General**

**11B-401.1 Scope.** The provisions of *Division 4* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

### **11B-402 Accessible routes**

**11B-402.1 General.** Accessible routes shall comply with 11B-402.

**11B-402.2 Components.** Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable requirements of *Division 4*.

### **11B-403 Walking surfaces**

**11B-403.1 General.** Walking surfaces that are a part of an accessible route shall comply with *Section 11B-403*.

**11B-403.2 Floor or ground surface.** Floor or ground surfaces shall comply with *Section 11B-302*.

**11B-403.3 Slope.** The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of walking surfaces shall not be steeper than 1:48.

**Exception:** The running slope of sidewalks shall not exceed the general grade established for the adjacent street or highway.

**11B-403.4 Changes in level.** Changes in level shall comply with *Section 11B-303*.

**11B-403.5 Clearances.** Walking surfaces shall provide clearances complying with *Section 11B-403.5*.

**Exception:** Within employee work areas, clearances on common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

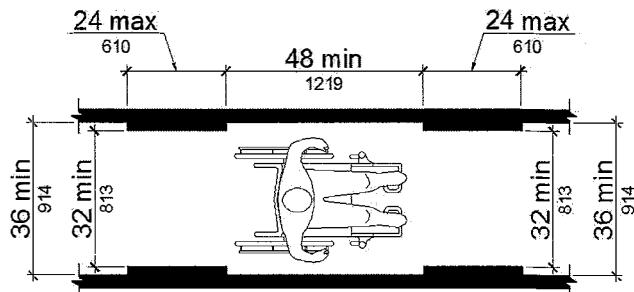
**11B-403.5.1 Clear width.** Except as provided in *Sections 11B-403.5.2* and *11B-403.5.3*, the clear width of walking surfaces shall be 36 inches (914 mm) minimum.

#### **Exceptions:**

1. The clear width shall be permitted to be reduced to 32 inches (813 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1219 mm) long minimum and 36 inches (914 mm) wide minimum.
2. The clear width for walking surfaces in corridors serving an occupant load of 10 or more shall be 44 inches (1118 mm) minimum.
3. The clear width for sidewalks and walks shall be 48 inches (1219 mm) minimum. When, because of right-of-way restrictions, natural barriers or

other existing conditions, the enforcing agency determines that compliance with the 48-inch (1219 mm) clear sidewalk width would create an unreasonable hardship, the clear width may be reduced to 36 inches (914 mm).

4. The clear width for aisles shall be 36 inches (914 mm) minimum if serving elements on only one side, and 44 inches (1118 mm) minimum if serving elements on both sides.
5. The clear width for accessible routes to accessible toilet compartments shall be 44 inches (1118 mm) except for door-opening widths and door swings.



**FIGURE 11B-403.5.1  
CLEAR WIDTH OF AN ACCESSIBLE ROUTE**

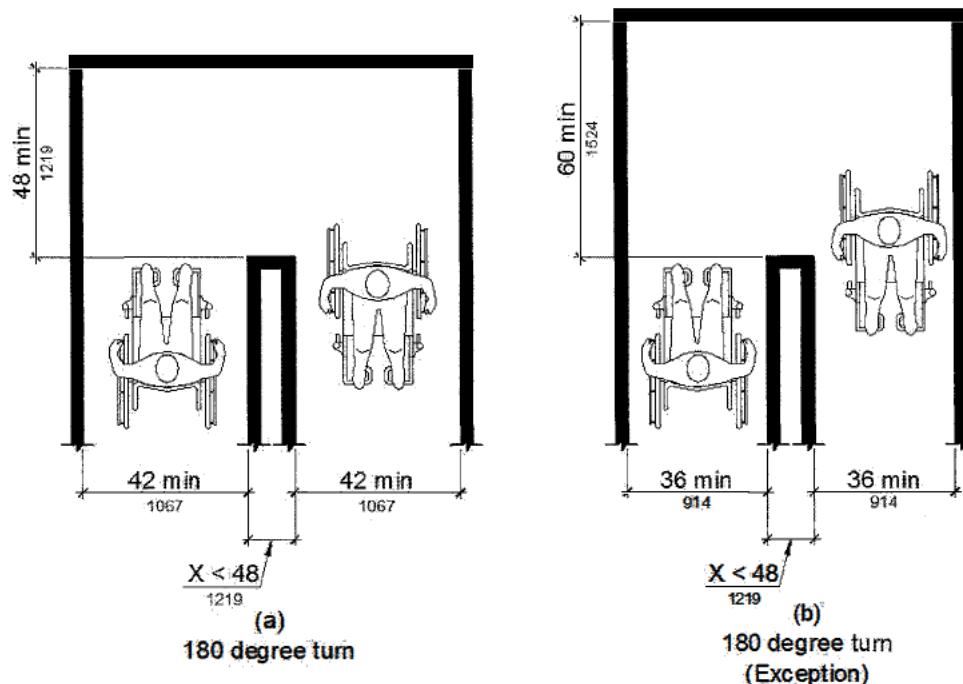
**11B-403.5.2 Clear width at turn.** Where the accessible route makes a 180 degree turn around an element which is less than 48 inches (1219 mm) wide, clear width shall be 42 inches (1067 mm) minimum approaching the turn, 48 inches (1219 mm) minimum at the turn and 42 inches (1067 mm) minimum leaving the turn.

**Exception:** Where the clear width at the turn is 60 inches (1524 mm) minimum compliance with *Section 11B-403.5.2* shall not be required.

**11B-403.5.3 Passing spaces.** An accessible route with a clear width less than 60 inches (1524 mm) shall provide passing spaces at intervals of 200 feet (60,960 mm) maximum. Passing spaces shall be either: a space 60 inches (1524 mm) minimum by 60 inches (1524 mm) minimum; or, an intersection of two walking surfaces providing a T-shaped space complying with *Section 11B-304.3.2* where the base and arms of the T-shaped space extend 48 inches (1219 mm) minimum beyond the intersection.

**11B-403.6 Handrails.** Where handrails are provided along walking surfaces with running slopes not steeper than 1:20 they shall comply with *Section 11B-505*.

**11B-403.7 Continuous gradient.** All walks with continuous gradients shall have resting areas, 60 inches (1524 mm) in length, at intervals of 400 feet (121,920 mm) maximum. The resting area shall be at least as wide as the walk. The slope of the resting area in all directions shall be 1:48 maximum.

FIGURE 11B-403.5.2  
CLEAR WIDTH AT TURN**11B-404 Doors, doorways, and gates**

**11B-404.1 General.** Doors, doorways, and gates that are part of an accessible route shall comply with *Section 11B-404*.

**Exceptions:**

1. Doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with *Sections 11B-404.2.7, 11B-404.2.8, 11B-404.2.9, 11B-404.3.2 and 11B-404.3.4 through 11B-404.3.7*. A sign visible from the approach side complying with *Section 11B-703.5* shall be posted stating "Entry restricted and controlled by security personnel".
2. At detention and correctional facilities, doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with *Sections 11B-404.2.7, 11B-404.2.8, 11B-404.2.9, 11B-404.3.2 and 11B-404.3.4 through 11B-404.3.7*.

**11B-404.2 Manual doors, doorways, and manual gates**  
Manual doors and doorways and manual gates intended for user passage shall comply with *Section 11B-404.2*.

**11B-404.2.1 Revolving doors, gates, and turnstiles.**  
Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.

**11B-404.2.2 Double-leaf doors and gates.** At least one of the active leaves of doorways with two leaves shall comply with *Sections 11B-404.2.3 and 11B-404.2.4*.

**11B-404.2.3 Clear width.** Door openings shall provide a clear width of 32 inches (813 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (914 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (864 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the finish floor or ground shall not exceed 4 inches (102 mm).

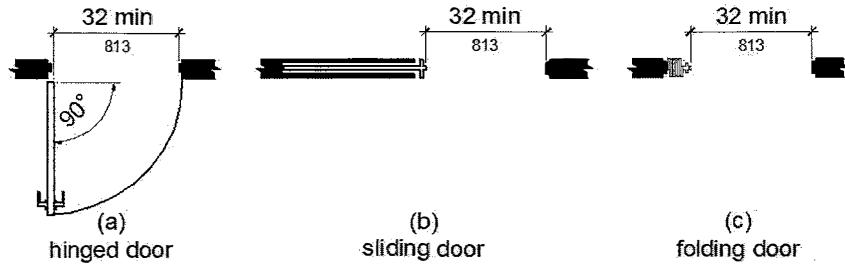
**Exceptions:**

1. In alterations, a projection of  $\frac{5}{8}$  inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and door stops shall be permitted to be 78 inches (1981 mm) minimum above the finish floor or ground.

**11B-404.2.4 Maneuvering clearances.** Minimum maneuvering clearances at doors and gates shall comply with *Section 11B-404.2.4*. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

**Exception: Reserved.**

**11B-404.2.4.1 Swinging doors and gates.** Swinging doors and gates shall have maneuvering clearances complying with *Table 11B-404.2.4.1*.



**FIGURE 11B-404.2.3  
CLEAR WIDTH OF DOORWAYS**

**TABLE 11B-404.2.4.1  
MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS AND GATES**

TYPE OF USE		MINIMUM MANEUVERING CLEARANCE	
Approach direction	Door or gate side	Perpendicular to doorway	Parallel to doorway (beyond latch side unless noted)
From front	Pull	60 inches (1524 mm)	18 inches (457 mm) <sup>5</sup>
From front	Push	48 inches (1219 mm)	0 inches (0 mm) <sup>1</sup>
From hinge side	Pull	60 inches (1524 mm)	36 inches (914 mm)
From hinge side	Push	44 inches (1118 mm) <sup>2</sup>	22 inches (559 mm) <sup>3</sup>
From latch side	Pull	60 inches (1524 mm)	24 inches (610 mm)
From latch side	Push	44 inches (1118 mm) <sup>4</sup>	24 inches (610 mm)

1. Add 12 inches (305 mm) if closer and latch are provided.

2. Add 4 inches (102 mm) if closer and latch are provided.

3. Beyond hinge side.

4. Add 4 inches (102 mm) if closer is provided.

5. Add 6 inches (152 mm) at exterior side of exterior doors.

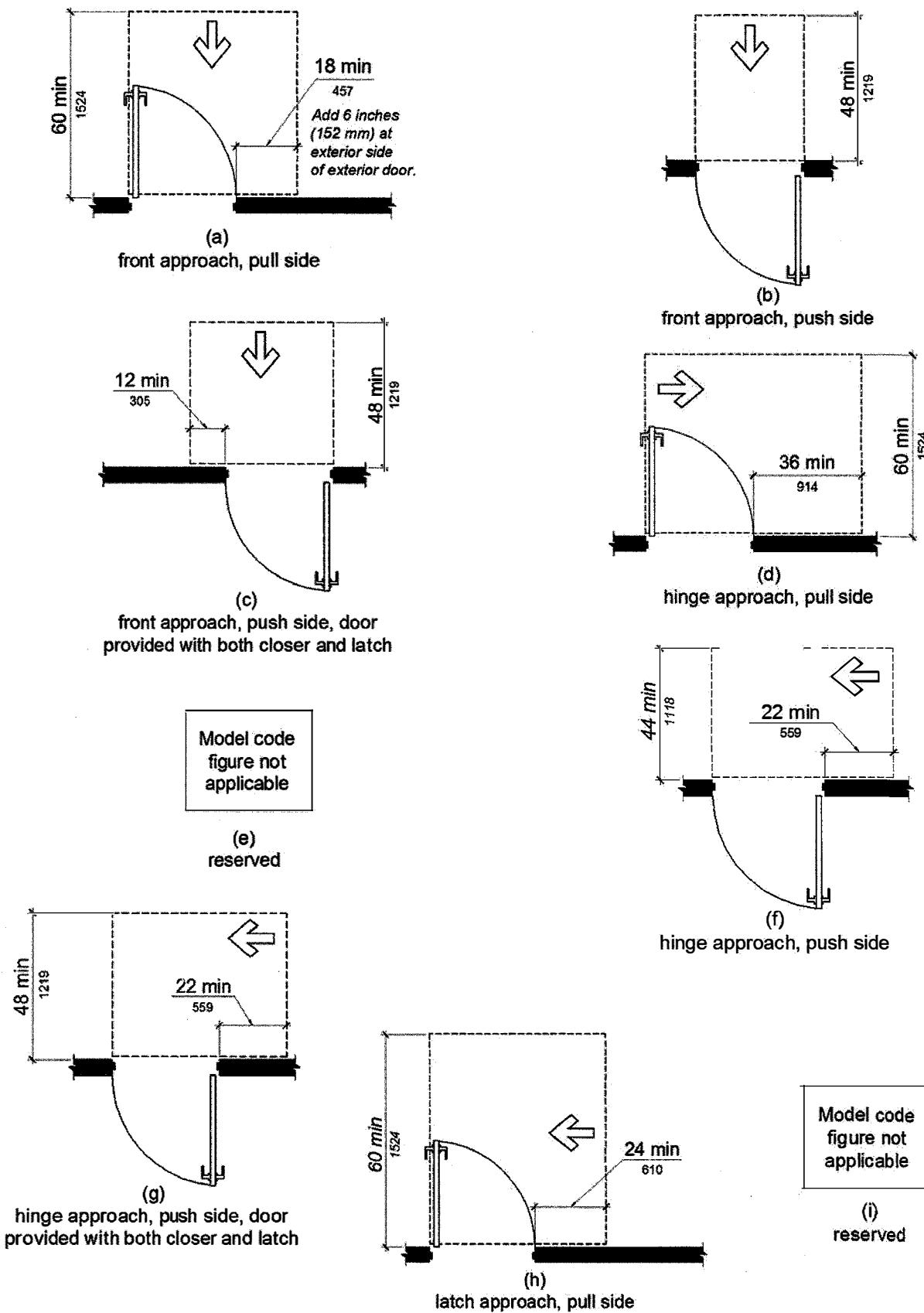
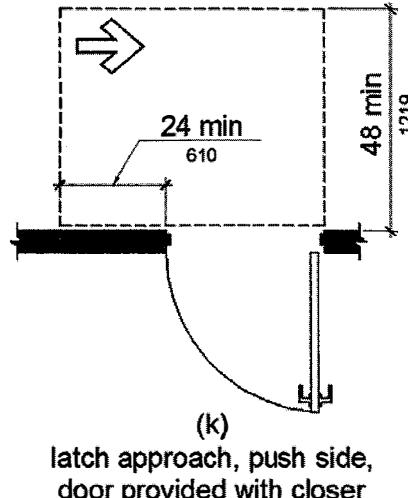
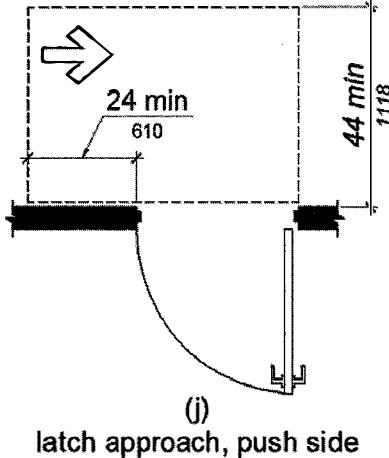


FIGURE 11B-404.2.4.1  
MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS AND GATES



**FIGURE 11B-404.2.4.1—continued**  
**MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS AND GATES**

**11B-404.2.4.2 Doorways without doors or gates, sliding doors, and folding doors.** Doorways less than 36 inches (914 mm) wide without doors or gates, sliding doors, or folding doors shall have maneuvering clearances complying with Table 11B-404.2.4.2.

**11B-404.2.4.3 Recessed doors and gates.** Maneuvering clearances for forward approach shall be provided when any obstruction within 18 inches (457 mm) of the latch side at *an interior doorway, or within 24 inches (610 mm) of the latch side of an exterior doorway*, projects more than 8 inches (203 mm) beyond the face of the door, measured perpendicular to the face of the door or gate.

**11B-404.2.4.4 Floor or ground surface.** Floor or ground surface within required maneuvering clearances shall comply with Section 11B-302. Changes in level are not permitted.

**Exceptions:**

1. Slopes not steeper than 1:48 shall be permitted.
2. Changes in level at thresholds complying with Section 11B-404.2.5 shall be permitted.

**11B-404.2.5 Thresholds.** Thresholds, if provided at doorways, shall be  $\frac{1}{2}$  inch (12.7 mm) high maximum. Raised thresholds and changes in level at doorways shall comply with Sections 11B-302 and 11B-303.

**Exception: Reserved.**

**11B-404.2.6 Doors in series and gates in series.** The distance between two hinged or pivoted doors in series and gates in series shall be 48 inches (1219 mm) minimum plus the width of doors or gates swinging into the space.

**11B-404.2.7 Door and gate hardware.** Handles, pulls, latches, locks, and other operable parts on doors and gates

shall comply with Section 11B-309.4. Operable parts of such hardware shall be 34 inches (864 mm) minimum and 44 inches (1118 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

**Exceptions:**

1. Existing locks shall be permitted in any location at existing glazed doors without stiles, existing overhead rolling doors or grilles, and similar existing doors or grilles that are designed with locks that are activated only at the top or bottom rail.
2. Access gates in barrier walls and fences protecting pools, spas, and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1372 mm) maximum above the finish floor or ground provided the self-latching devices are not also self-locking devices and operated by means of a key, electronic opener, or integral combination lock.

**11B-404.2.8 Closing speed.** Door and gate closing speed shall comply with Section 11B-404.2.8.

**11B-404.2.8.1 Door closers and gate closers.** Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

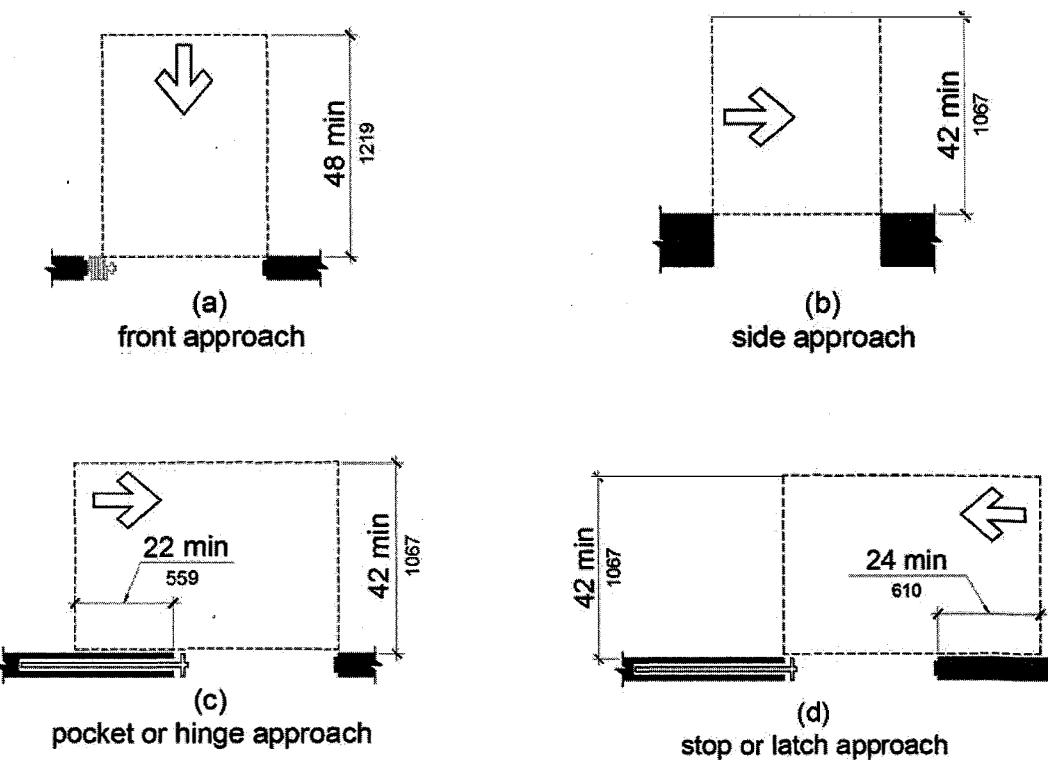
**11B-404.2.8.2 Spring hinges.** Door and gate spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

**TABLE 11B-404.2.4.2**  
**MANEUVERING CLEARANCES AT DOORWAYS WITHOUT DOORS OR**  
**GATES, MANUAL SLIDING DOORS, AND MANUAL FOLDING DOORS**

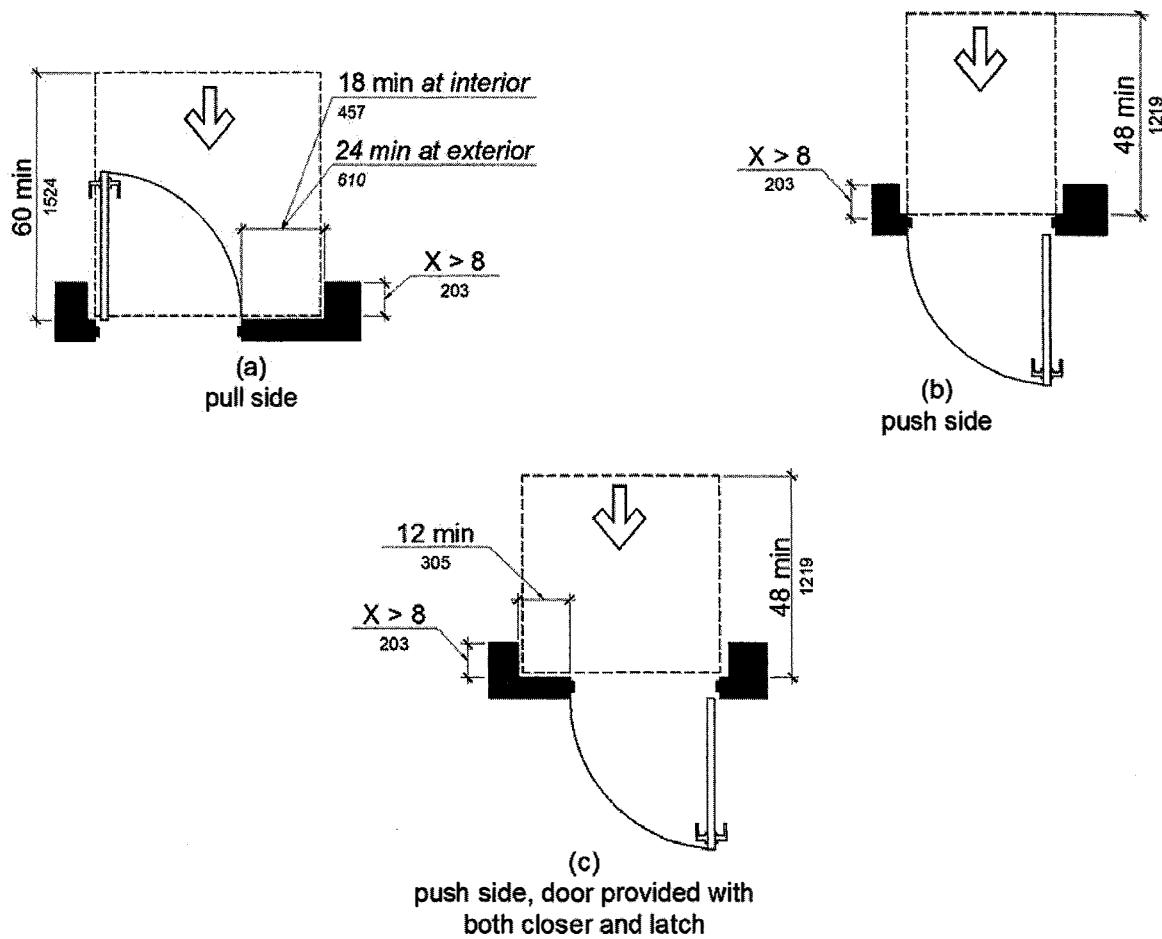
Approach direction	MINIMUM MANEUVERING CLEARANCE	
	Perpendicular to doorway	Parallel to doorway (beyond stop/latch side unless noted)
From Front	48 inches (1219 mm)	0 inches (0 mm)
From side <sup>1</sup>	42 inches (1067 mm)	0 inches (0 mm)
From pocket/hinge side	42 inches (1067 mm)	22 inches (559 mm) <sup>2</sup>
From stop/latch side	42 inches (1067 mm)	24 inches (610 mm)

1. Doorway with no door only.

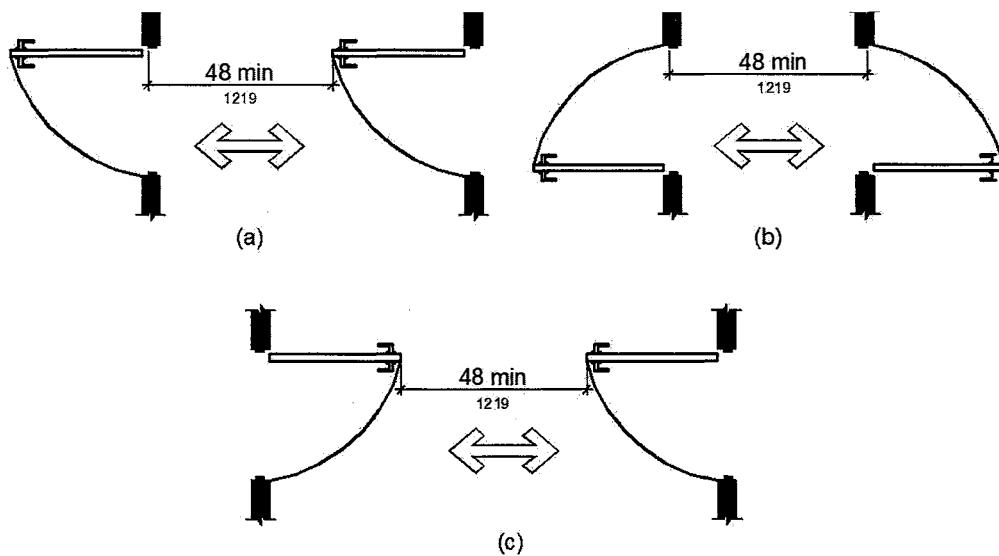
2. Beyond pocket/hinge side.



**FIGURE 11B-404.2.4.2**  
**MANEUVERING CLEARANCES AT DOORWAYS WITHOUT DOORS, SLIDING DOORS, GATES, AND FOLDING DOORS**



**FIGURE 11B-404.2.4.3**  
MANEUVERING CLEARANCES AT RECESSED DOORS AND GATES



**FIGURE 11B-404.2.6**  
DOORS IN SERIES AND GATES IN SERIES

**11B-404.2.9 Door and gate opening force.** The force for pushing or pulling open a door or gate shall be as follows:

1. Interior hinged doors and gates: 5 pounds (22.2 N) maximum.
2. Sliding or folding doors: 5 pounds (22.2 N) maximum.
3. *Required fire doors: the minimum opening force allowable by the appropriate administrative authority, not to exceed 15 pounds (66.7 N).*
4. *Exterior hinged doors: 5 pounds (22.2 N) maximum.*

These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door or gate in a closed position.

**Exceptions:**

1. *Exterior doors to machinery spaces including, but not limited to, elevator pits or elevator penthouses; mechanical, electrical or communications equipment rooms; piping or equipment catwalks; electric substations and transformer vaults; and highway and tunnel utility facilities.*
2. *When, at a single location, one of every eight exterior door leafs, or fraction of eight, is a powered door, other exterior doors at the same location, serving the same interior space, may have a maximum opening force of 8.5 pounds (37.8 N). The powered leaf(s) shall be located closest to the accessible route.*
  - a. *Powered doors shall comply with Section 11B-404.3. Powered doors shall be fully automatic doors complying with Builders Hardware Manufacturers' Association (BHMA) A156.10 or low energy operated doors complying with BHMA A156.19.*
  - b. *Powered doors serving a building or facility with an occupancy of 150 or more shall be provided with a back-up battery or back-up generator. The back-up power source shall be able to cycle the door a minimum of 100 cycles.*
  - c. *Powered doors shall be controlled on both the interior and exterior sides of the doors by sensing devices, push plates, vertical actuation bars or other similar operating devices complying with Sections 11B-304, 11B-305 and 11B-308.*

*At each location where push plates are provided there shall be two push plates; the centerline of one push plate shall be 7 inches (178 mm) minimum and 8 inches (203 mm) maximum above the floor or ground surface and the centerline of the second push plate shall be 30 inches (762 mm) minimum and 44 inches (1118 mm) maximum above the floor or ground surface. Each push plate shall be a minimum of 4 inches (102 mm) diameter or a mini-*

*mum of 4 inches by 4 inches (102 mm by 102 mm) square and shall display the International Symbol of Accessibility complying with Section 11B-703.7.*

*At each location where vertical actuation bars are provided the operable portion shall be located so the bottom is 5 inches (127 mm) maximum above the floor or ground surface and the top is 35 inches (889 mm) minimum above the floor or ground surface. The operable portion of each vertical actuation bar shall be a minimum of 2 inches (51 mm) wide and shall display the International Symbol of Accessibility complying with Section 11B-703.7.*

*Where push plates, vertical actuation bars or other similar operating devices are provided, they shall be placed in a conspicuous location. A level and clear floor or ground space for forward or parallel approach complying with Section 11B-305 shall be provided, centered on the operating device. Doors shall not swing into the required clear floor or ground space.*

- d. *Signage identifying the accessible entrance required by Section 11B-216.6 shall be placed on, or immediately adjacent to, each powered door. Signage shall be provided in compliance with BHMA A156.10 or BHMA A156.19, as applicable.*
- e. *In addition to the requirements of Item d, where a powered door is provided in buildings or facilities containing assembly occupancies of 300 or more, a sign displaying the International Symbol of Accessibility measuring 6 inches by 6 inches (152 mm by 152 mm), complying with Section 11B-703.7, shall be provided above the door on both the interior and exterior sides of each powered door.*

**11B-404.2.10 Door and gate surfaces.** Swinging door and gate surfaces within 10 inches (254 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within  $\frac{1}{16}$  inch (1.6 mm) of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped.

**Exceptions:**

1. Sliding doors shall not be required to comply with Section 11B-404.2.10.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at 60 degrees minimum from the horizontal shall not be required to meet the 10 inch (254 mm) bottom smooth surface height requirement.

3. Doors and gates that do not extend to within 10 inches (254 mm) of the finish floor or ground shall not be required to comply with *Section 11B-404.2.10*.

#### 4. Reserved.

**11B-404.2.11 Vision lights.** Doors, gates, and side lights adjacent to doors or gates, containing one or more glazing panels that permit viewing through the panels shall have the bottom of at least one glazed panel located 43 inches (1092 mm) maximum above the finish floor.

**Exception:** *Glazing panels* with the lowest part more than 66 inches (1676 mm) from the finish floor or ground shall not be required to comply with *Section 11B-404.2.11*.

**11B-404.3 Automatic and power-assisted doors and gates.** Automatic doors and automatic gates shall comply with *Section 11B-404.3*. Full-powered automatic doors shall comply with ANSI/BHMA A156.10. Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19.

**11B-404.3.1 Clear width.** Doorways shall provide a clear opening of 32 inches (813 mm) minimum in power-on and power-off mode. The minimum clear width for automatic door systems in a doorway *shall provide a clear, unobstructed opening of 32 inches (813 mm) with one leaf positioned at an angle of 90 degrees from its closed position*.

**11B-404.3.2 Maneuvering clearance.** Clearances at power-assisted doors and gates shall comply with *Section 11B-404.2.4*. Clearances at automatic doors and gates without standby power and serving an accessible means of egress shall comply with *Section 11B-404.2.4*.

**Exception:** Where automatic doors and gates remain open in the power-off condition, compliance with *Section 11B-404.2.4* shall not be required.

**11B-404.3.3 Thresholds.** Thresholds and changes in level at doorways shall comply with *Section 11B-404.2.5*.

**11B-404.3.4 Doors in series and gates in series.** Doors in series and gates in series shall comply with *Section 11B-404.2.6*.

**11B-404.3.5 Controls.** Manually operated controls shall comply with *Section 11B-309*. The clear floor space adjacent to the control shall be located beyond the arc of the door swing.

**11B-404.3.6 Break out opening.** Where doors and gates without standby power are a part of a means of egress, the clear break out opening at swinging or sliding doors and gates shall be 32 inches (813 mm) minimum when operated in emergency mode.

**Exception:** Where manual swinging doors and gates comply with *Section 11B-404.2* and serve the same means of egress compliance with *Section 11B-404.3.6* shall not be required.

**11B-404.3.7 Revolving doors, revolving gates, and turnstiles.** Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.

## 11B-405 Ramps

**11B-405.1 General.** Ramps on accessible routes shall comply with *Section 11B-405*.

**Exception:** In assembly areas, aisle ramps adjacent to seating and not serving elements required to be on an accessible route shall not be required to comply with *Section 11B-405*.

**11B-405.2 Slope.** Ramp runs shall have a running slope not steeper than 1:12.

**Exception:** *Reserved*.

**11B-405.3 Cross slope.** Cross slope of ramp runs shall not be steeper than 1:48.

**11B-405.4 Floor or ground surfaces.** Floor or ground surfaces of ramp runs shall comply with *Section 11B-302*. Changes in level other than the running slope and cross slope are not permitted on ramp runs.

**11B-405.5 Clear width.** The clear width of a ramp run *shall be 48 inches (1219 mm) minimum*.

#### Exceptions:

1. Within employee work areas, the required clear width of ramps that are a part of common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.
2. *Handrails may project into the required clear width of the ramp at each side 3½ inches (89 mm) maximum at the handrail height.*
3. *The clear width of ramps in residential uses serving an occupant load of fifty or less shall be 36 inches (914 mm) minimum between handrails.*

**11B-405.6 Rise.** The rise for any ramp run shall be 30 inches (762 mm) maximum.

**11B-405.7 Landings.** Ramps shall have landings at the top and the bottom of each ramp run. Landings shall comply with *Section 11B-405.7*.

**11B-405.7.1 Slope.** Landings shall comply with *Section 11B-302*. Changes in level are not permitted.

**Exception:** Slopes not steeper than 1:48 shall be permitted.

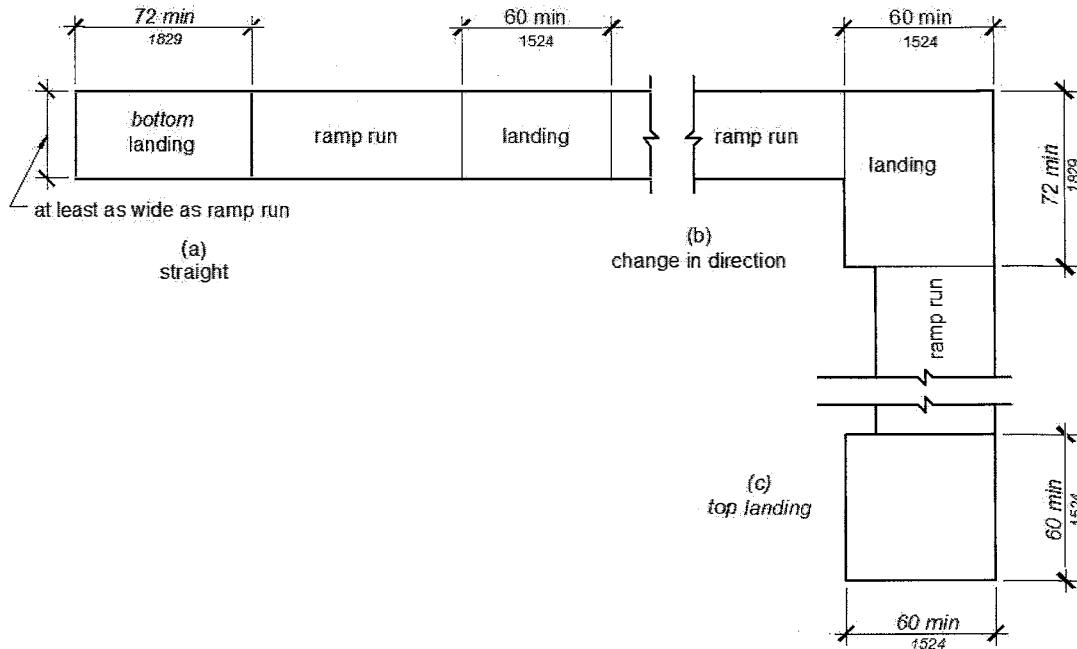
**11B-405.7.2 Width.** The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

**11B-405.7.2.1:** *Top landings shall be 60 inches (1524 mm) wide minimum.*

**11B-405.7.3 Length.** The landing clear length shall be 60 inches (1524 mm) long minimum.

**11B-405.7.3.1:** *Bottom landings shall extend 72 inches (1829 mm) minimum in the direction of ramp run.*

**11B-405.7.4 Change in direction.** Ramps that change direction between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 72 inches (1829 mm) minimum in the direction of downward travel from the upper ramp run.



**FIGURE 11B-405.7  
RAMPS LANDINGS**

**11B-405.7.5 Doorways.** Where doorways are located adjacent to a ramp landing, maneuvering clearances required by Sections 11B-404.2.4 and 11B-404.3.2 shall be permitted to overlap the required landing area. *Doors, when fully open, shall not reduce the required ramp landing width by more than 3 inches (76 mm). Doors, in any position, shall not reduce the minimum dimension of the ramp landing to less than 42 inches (1067 mm).*

**11B-405.8 Handrails.** Ramp runs shall have handrails complying with Section 11B-505.

**Exceptions:**

1. Reserved.
2. Reserved.
3. Curb ramps do not require handrails.
4. At door landings, handrails are not required on ramp runs less than 6 inches (152 mm) in rise or 72 inches (1829 mm) in length.

**11B-405.9 Edge protection.** Edge protection complying with Section 11B-405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

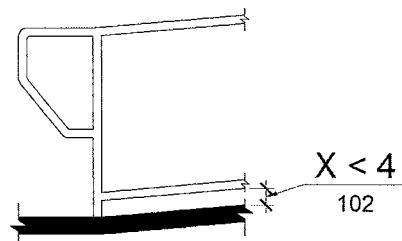
**Exceptions:**

1. Edge protection shall not be required on ramps that are not required to have handrails and have sides complying with Section 11B-406.2.2.
2. Edge protection shall not be required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection shall not be required on the sides of ramp landings having a vertical drop-off of  $\frac{1}{2}$  inch (12.7 mm) maximum within 10 inches (254 mm)

horizontally of the minimum landing area specified in Section 11B-405.7.

**11B-405.9.1 Reserved.**

**11B-405.9.2 Curb or barrier.** A curb, 2 inches (51 mm) high minimum, or barrier shall be provided that prevents the passage of a 4 inch (102 mm) diameter sphere, where any portion of the sphere is within 4 inches (102 mm) of the finish floor or ground surface. *To prevent wheel entrapment, the curb or barrier shall provide a continuous and uninterrupted barrier along the length of the ramp.*



**FIGURE 11B-405.9.2  
CURB OR BARRIER EDGE PROTECTION**

**11B-405.10 Wet conditions.** Landings subject to wet conditions shall be designed to prevent the accumulation of water.

**11B-406 Curb ramps, blended transitions and islands**

**11B-406.1 General.** Curb ramps, blended transitions and islands on accessible routes shall comply with Section 11B-406. Curb ramps may be perpendicular, parallel, or a combination of perpendicular and parallel.

**11B-406.1.1 Perpendicular curb ramps.** Perpendicular curb ramps shall comply with Section 11B-406.2.

**11B-406.1.2 Parallel curb ramps.** Parallel curb ramps shall comply with Section 11B-406.3.

**11B-406.1.3 Blended transitions.** Blended transitions shall comply with Section 11B-406.4.

**11B-406.1.4 Islands.** Islands shall comply with Section 11B-406.6.

**11B-406.2 Perpendicular curb ramps.** Perpendicular curb ramps shall comply with Sections 11B-406.2 and 11B-406.5.

**11B-406.2.1 Slope.** Ramp runs shall have a running slope not steeper than 1:12.

**11B-406.2.2 Sides of curb ramps.** Where provided, curb ramp flares shall not be steeper than 1:10.

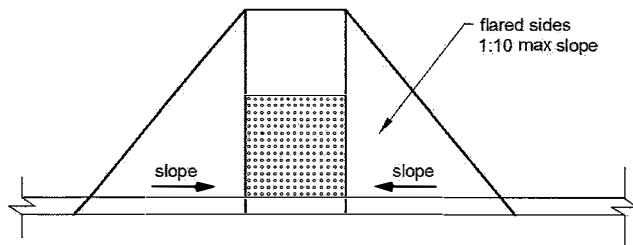


FIGURE 11B-406.2.2  
SIDES OF CURB RAMPS

**11B-406.3 Parallel curb ramps.** Parallel curb ramps shall comply with Sections 11B-406.3 and 11B-406.5.

**11B-406.3.1 Slope.** The running slope of the curb ramp segments shall be in-line with the direction of sidewalk travel. Ramp runs shall have a running slope not steeper than 1:12.

**11B-406.3.2 Turning space.** A turning space 48 inches (1219 mm) minimum by 48 inches (1219 mm) minimum shall be provided at the bottom of the curb ramp. The slope of the turning space in all directions shall be 1:48 maximum.

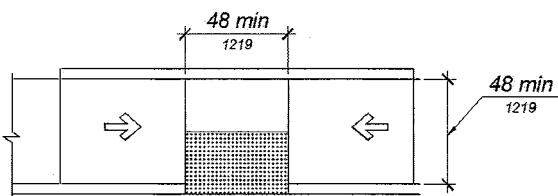


FIGURE 11B-406.3.2  
PARALLEL CURB RAMPS

**11B-406.4 Blended transitions.** Blended transitions shall comply with Sections 11B-406.4 and 11B-406.5.

**11B-406.4.1 Slope.** Blended transitions shall have a running slope not steeper than 1:20.

**11B-406.5 Common requirements.** Curb ramps and blended transitions shall comply with Section 11B-406.5.

**11B-406.5.1 Location.** Curb ramps and the flared sides of curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.

**Exception:** Diagonal curb ramps shall comply with Section 11B-406.5.9.

**11B-406.5.2 Width.** The clear width of curb ramp runs (excluding any flared sides), blended transitions, and turning spaces shall be 48 inches (1219 mm) minimum.

**11B-406.5.3 Landings.** Landings shall be provided at the tops of curb ramps and blended transitions. The landing clear length shall be 48 inches (1219 mm) minimum. The landing clear width shall be at least as wide as the curb ramp, excluding any flared sides, or the blended transition leading to the landing. The slope of the landing in all directions shall be 1:48 maximum.

**Exception:** Parallel curb ramps shall not be required to comply with Section 11B-406.5.3.

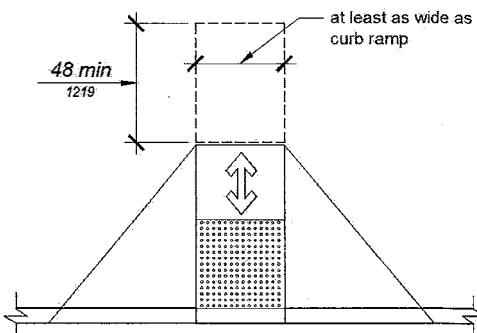


FIGURE 11B-406.5.3  
LANDINGS AT THE TOP OF CURB RAMPS

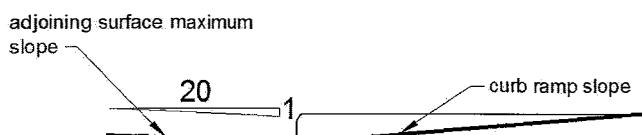
**11B-406.5.4 Floor or ground surfaces.** Floor or ground surfaces of curb ramps and blended transitions shall comply with Section 11B-405.4.

**11B-406.5.5 Wet conditions.** Curb ramps and blended transitions shall comply with Section 11B-405.10.

**11B-406.5.6 Grade breaks.** Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.

**11B-406.5.7 Cross slope.** The cross slope of curb ramps and blended transitions shall be 1:48 maximum.

**11B-406.5.8 Counter slope.** Counter slopes of adjoining gutters and road surfaces immediately adjacent to and within 24 inches (610 mm) of the curb ramp shall not be steeper than 1:20. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.



**FIGURE 11B-406.5.8  
COUNTER SLOPE OF SURFACES ADJACENT TO CURB RAMPS**

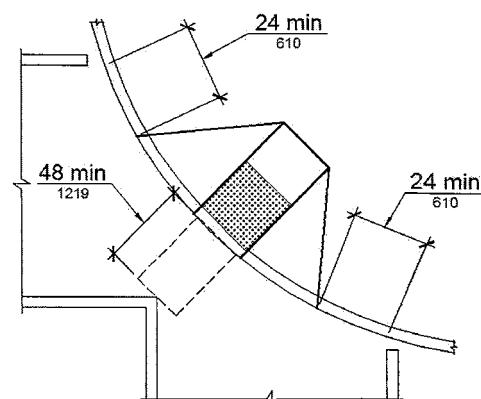
**11B-406.5.9 Clear space at diagonal curb ramps.** The bottom of diagonal curb ramps shall have a clear space 48 inches (1219 mm) minimum outside active traffic lanes of the roadway. Diagonal curb ramps provided at marked crossings shall provide the 48 inches (1219 mm) minimum clear space within the markings.

**11B-406.5.10 Diagonal curb ramps.** Diagonal or corner type curb ramps with returned curbs or other well-defined edges shall have the edges parallel to the direction of pedestrian flow. Diagonal curb ramps with flared sides shall have a segment of curb 24 inches (610 mm) long minimum located on each side of the curb ramp and within the marked crossing.

**11B-406.5.11 Reserved.**

**11B-406.5.12 Detectable warnings.** Curb ramps and blended transitions shall have detectable warnings complying with Section 11B-705.

**11B-406.6 Islands.** Raised islands in crossings shall be cut through level with the street or have curb ramps at both sides. The clear width of the accessible route at islands shall be 60 inches (1524 mm) wide minimum. Where curb ramps are provided, they shall comply with Section 11B-406. Landings complying with Section 11B-406.5.3 and the accessible route shall be permitted to overlap. Islands shall have detectable warnings complying with Section 11B-705.



**FIGURE 11B-406.5.10  
DIAGONAL OR CORNER TYPE CURB RAMPS**

**11B-407 Elevators**

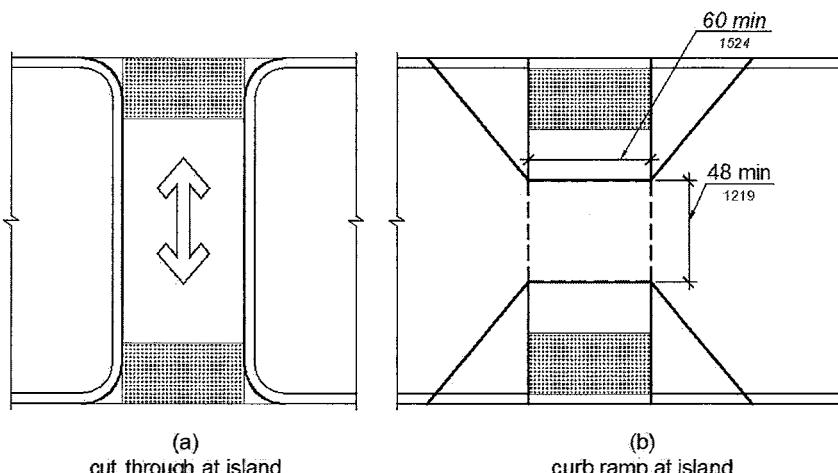
**11B-407.1 General.** Elevators shall comply with Section 11B-407 and with ASME A17.1. They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

**11B-407.1.1 Combined passenger and freight elevators.** When the only elevators provided for use by the public and employees are combination passenger and freight elevators, they shall comply with Section 11B-407 and with ASME A17.1.

**11B-407.2 Elevator landing requirements.** Elevator landings shall comply with Section 11B-407.2.

**11B-407.2.1 Call controls.** Where elevator call buttons or keypads are provided, they shall comply with Sections 11B-407.2.1 and 11B-309.4.

**Exception: Reserved.**



**FIGURE 11B-406.6  
ISLANDS IN CROSSINGS**

**11B-407.2.1.1 Height.** Call buttons and keypads shall be located within one of the reach ranges specified in *Section 11B-308*, measured to the centerline of the highest operable part.

**Exception: Reserved.**

**11B-407.2.1.2 Size and shape.** Call buttons shall have square shoulders, be  $\frac{3}{4}$  inch (19.1 mm) minimum in the smallest dimension and shall be raised  $\frac{1}{8}$  inch (3.2 mm) plus or minus  $\frac{1}{32}$  inch (0.8 mm) above the surrounding surface. The buttons shall be activated by a mechanical motion that is detectable.

**Exception: Reserved.**

**11B-407.2.1.3 Clear floor or ground space.** A clear floor or ground space complying with *Section 11B-305* shall be provided at call controls.

**11B-407.2.1.4 Location.** The call button that designates the up direction shall be located above the call button that designates the down direction.

**Exception: Reserved.**

**11B-407.2.1.5 Signals.** Call buttons shall have visible signals that will activate when each call is registered and will extinguish when each call is answered. Call buttons shall be internally illuminated with a white light over the entire surface of the button.

**Exceptions:**

1. *Reserved.*
2. *Reserved.*

**11B-407.2.1.6 Keypads.** Where keypads are provided, keypads shall be in a standard telephone keypad arrangement and shall comply with *Section 11B-407.4.7.2*.

**11B-407.2.2 Hall signals.** Hall signals, including in-car signals, shall comply with *Section 11B-407.2.2*.

**11B-407.2.2.1 Visible and audible signals.** A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call and the car's direction of travel. Where in-car signals are provided, they shall be visible from the floor area adjacent to the hall call buttons.

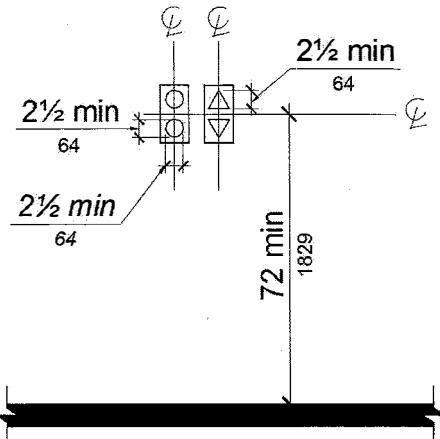
**Exceptions:**

1. *Reserved.*
2. *Reserved.*

**11B-407.2.2.2 Visible signals.** Visible signal fixtures shall be centered at 72 inches (1829 mm) minimum above the finish floor or ground. The visible signal elements shall be a minimum  $2\frac{1}{2}$  inches (64 mm) high by  $2\frac{1}{2}$  inches (64 mm) wide. Signals shall be visible from the floor area adjacent to the hall call button.

**Exceptions:**

1. *Reserved.*
2. *Reserved.*



**FIGURE 11B-407.2.2.2  
VISIBLE HALL SIGNALS**

**11B-407.2.2.3 Audible signals.** Audible signals shall sound once for the up direction and twice for the down direction, or shall have verbal annunciators that indicate the direction of elevator car travel. Audible signals shall have a frequency of 1500 Hz maximum. Verbal annunciators shall have a frequency of 300 Hz minimum and 3000 Hz maximum. The audible signal and verbal annunciator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the hall call button.

**Exceptions:**

1. *Reserved.*
2. *Reserved.*

**11B-407.2.2.4 Reserved**

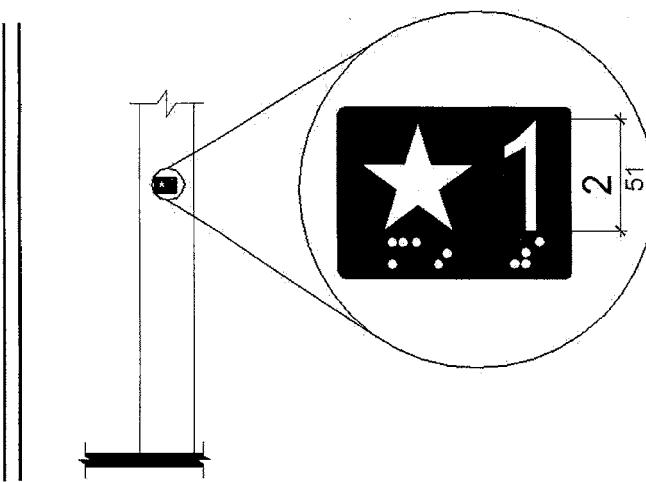
**11B-407.2.3 Hoistway signs.** Signs at elevator hoistways shall comply with *Section 11B-407.2.3*.

**11B-407.2.3.1 Floor designation.** Floor designations complying with *Sections 11B-703.2* and *11B-703.4.1* shall be provided on both jambs of elevator hoistway entrances. Floor designations shall be provided in both raised characters and Braille. Raised characters shall be 2 inches (51 mm) high. A raised star, placed to the left of the floor designation, shall be provided on both jambs at the main entry level. The outside diameter of the star shall be 2 inches (51 mm) and all points shall be of equal length. Raised characters, including the star, shall be white on a black background. Braille complying with *Section 11B-703.3* shall be placed below the corresponding raised characters and the star. The Braille translation for the star shall be "MAIN". Applied plates are acceptable if they are permanently fixed to the jamb.

**11B-407.2.3.2 Reserved**

**11B-407.3 Elevator door requirements.** Hoistway and car doors shall comply with *Section 11B-407.3*.

**11B-407.3.1 Type.** Elevator doors shall be the horizontal sliding type. Car gates shall be prohibited.



**FIGURE 11B-407.2.3.1  
FLOOR DESIGNATIONS ON JAMBS  
OF ELEVATOR HOISTWAY ENTRANCE**

**11B-407.3.2 Operation.** Elevator hoistway and car doors shall open and close automatically.

**Exception:** Existing manually operated hoistway swing doors shall be permitted provided that they comply with Sections 11B-404.2.3 and 11B-404.2.9. Car door closing shall not be initiated until the hoistway door is closed.

**11B-407.3.3 Reopening device.** Elevator doors shall be provided with a reopening device complying with Section 11B-407.3.3 that shall stop and reopen a car door and hoistway door automatically if the door becomes obstructed by an object or person.

**Exception:** Existing elevators with manually operated doors shall not be required to comply with Section 11B-407.3.3.

**11B-407.3.3.1 Height.** The device shall be activated by sensing an obstruction passing through the opening at 5 inches (127 mm) nominal and 29 inches (737 mm) nominal above the finish floor.

**11B-407.3.3.2 Contact.** The device shall not require physical contact to be activated, although contact is permitted to occur before the door reverses.

**11B-407.3.3.3 Duration.** Door reopening devices shall remain effective for 20 seconds minimum.

**11B-407.3.4 Door and signal timing.** The minimum acceptable time from notification that a car is answering a call until the doors of that car start to close shall be calculated from the following equation:

$T = D/(1.5 \text{ ft/s})$  or  $T = D/(457 \text{ mm/s}) = 5 \text{ seconds}$  minimum where  $T$  equals the total time in seconds and  $D$  equals the distance (in feet or millimeters) from the point in the lobby or corridor 60 inches (1524 mm) directly in front of the farthest call button controlling that car to the centerline of its hoistway door.

#### Exceptions:

- For cars with in-car lanterns,  $T$  shall be permitted to begin when the signal is visible from the point 60 inches (1524 mm) directly in front of the farthest hall call button and the audible signal is sounded.

#### 2. Reserved.

**11B-407.3.5 Door delay.** Elevator doors shall remain fully open in response to a car call for 5 seconds minimum.

**11B-407.3.6 Width.** The width of elevator doors shall comply with Table 11B-407.4.1.

**Exception:** In existing elevators, a power-operated car door complying with Section 11B-404.2.3 shall be permitted.

**11B-407.4 Elevator car requirements.** Elevator cars shall comply with Section 11B-407.4.

**11B-407.4.1 Car dimensions.** Inside dimensions of elevator cars and clear width of elevator doors shall comply with Table 11B-407.4.1.

**Exception:** In existing buildings, where existing shaft configuration prohibits strict compliance with Section 11B-407.4.1, existing elevator car configurations that provide a clear floor area of 18 square feet ( $1.67 \text{ m}^2$ ) minimum and also provide an inside clear depth 54 inches (1372 mm) minimum and a clear width 48 inches (1219 mm) minimum shall be permitted.

**11B-407.4.2 Floor surfaces.** Floor surfaces in elevator cars shall comply with Sections 11B-302 and 11B-303.

**TABLE 11B-407.4.1  
ELEVATOR CAR DIMENSIONS**

DOOR LOCATION	MINIMUM DIMENSIONS			
	Door clear width	Inside car, side to side	Inside car, back wall to front return	Inside car, back wall to inside face of door
Centered	42 inches (1067 mm)	80 inches (2032 mm)	51 inches (1295 mm)	54 inches (1372 mm)
Side (off centered)	36 inches (914 mm) <sup>1</sup>	68 inches (1727 mm)	51 inches (1295 mm)	54 inches (1372 mm)
Any	36 inches (914 mm) <sup>1</sup>	54 inches (1372 mm)	80 inches (2032 mm)	80 inches (2032 mm)
Any	36 inches (914 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>	60 inches (1524 mm) <sup>2</sup>

1. A tolerance of minus  $\frac{5}{8}$  inch (15.9 mm) is permitted.

2. Other car configurations that provide a turning space complying with Section 11B-304 with the door closed shall be permitted.

**11B-407.4.3 Platform to hoistway clearance.** The clearance between the car platform sill and the edge of any hoistway landing shall be  $1\frac{1}{4}$  inch (32 mm) maximum.

**11B-407.4.4 Leveling.** Each car shall be equipped with a self-leveling feature that will automatically bring and maintain the car at floor landings within a tolerance of  $\frac{1}{2}$  inch (12.7 mm) under rated loading to zero loading conditions.

**11B-407.4.5 Illumination.** The level of illumination at the car controls, platform, car threshold and car landing sill shall be 5 foot candles (54 lux) minimum.

**11B-407.4.6 Elevator car controls.** Where provided, elevator car controls shall comply with *Sections 11B-407.4.6 and 11B-309.4*.

**Exception:** In existing elevators, where a new car operating panel complying with *Section 11B-407.4.6* is provided, existing car operating panels *may remain operational and shall not be required to comply with Section 11B-407.4.6*.

**11B-407.4.6.1 Location.** Controls shall be located within one of the reach ranges specified in *Section 11B-308*.

**Exceptions:**

1. Where the elevator panel serves more than 16 openings and a parallel approach is provided, buttons with floor designations shall be permitted to be 54 inches (1372 mm) maximum above the finish floor.
2. In existing elevators, car control buttons with floor designations shall be permitted to be located 54 inches (1372 mm) maximum above the finish floor where a parallel approach is provided.

**11B-407.4.6.2 Buttons.** Car control buttons with floor designations shall comply with *Section 11B-407.4.6.2*.

**Exception: Reserved.**

**11B-407.4.6.2.1 Size and shape.** Buttons shall have square shoulders, be  $\frac{3}{4}$  inch (19.1 mm) minimum in their smallest dimension and be raised  $\frac{1}{8}$  inch (3.2 mm) plus or minus  $\frac{1}{32}$  inch (0.8 mm) above the surrounding surface.

**11B-407.4.6.2.2 Arrangement.** Buttons shall be arranged with numbers in ascending order. When two or more columns of buttons are provided they shall read from left to right.

**11B-407.4.6.2.3 Illumination.** Car control buttons shall be illuminated.

**11B-407.4.6.2.4 Operation.** Car control buttons shall be activated by a mechanical motion that is detectable.

**11B-407.4.6.3 Keypads.** Car control keypads shall be in a standard telephone keypad arrangement and shall comply with *Section 11B-407.4.7.2*.

**11B-407.4.6.4 Emergency controls.** Emergency controls shall comply with *Section 11B-407.4.6.4*.

**11B-407.4.6.4.1 Height.** Emergency control buttons shall have their centerlines 35 inches (889 mm) minimum above the finish floor.

**11B-407.4.6.4.2 Location.** Emergency controls, including the emergency alarm, shall be grouped at the bottom of the panel.

**11B-407.4.7 Designations and indicators of car controls.** Designations and indicators of car controls shall comply with *Section 11B-407.4.7*.

**Exception:** In existing elevators, where a new car operating panel complying with *Section 11B-407.4.7* is provided, existing car operating panels *may remain operational and shall not be required to comply with Section 11B-407.4.7*.

**11B-407.4.7.1 Buttons.** Car control buttons shall comply with *Section 11B-407.4.7.1*.

**11B-407.4.7.1.1 Type.** Control buttons shall be identified by *raised characters or symbols, white on a black background, complying with Section 11B-703.2 and Braille complying with Section 11B-703.3*.

**11B-407.4.7.1.2 Location.** Raised characters or symbols and Braille designations shall be placed immediately to the left of the control button to which the designations apply.

**11B-407.4.7.1.3 Symbols.** The control button for the emergency stop, alarm, door open, door close, main entry floor, and phone, shall be identified with *raised symbols and Braille* as shown in *Table 11B-407.4.7.1.3*.

**11B-407.4.7.1.4 Visible indicators.** Buttons with floor designations shall be provided with visible indicators to show that a call has been registered. The visible indication shall extinguish when the car arrives at the designated floor.

**11B-407.4.7.1.5 Button spacing.** A minimum clear space of  $\frac{3}{8}$  inch (9.5 mm) or other suitable means of separation shall be provided between rows of control buttons.

**11B-407.4.7.2 Keypads.** Keypads shall be identified by characters complying with *Section 11B-703.5* and shall be centered on the corresponding keypad button. The number five key shall have a single raised dot. The dot shall be 0.118 inch (3 mm) to 0.120 inch (3.05 mm) base diameter and in other aspects comply with *Table 11B-703.3.1*.

**11B-407.4.8 Car position indicators.** Audible and visible car position indicators shall be provided in elevator cars.

**11B-407.4.8.1 Visible indicators.** Visible indicators shall comply with *Section 11B-407.4.8.1*.

**11B-407.4.8.1.1 Size.** Characters shall be  $1\frac{1}{2}$  inch (12.7 mm) high minimum.

**11B-407.4.8.1.2 Location.** Indicators shall be located above the car control panel or above the door.

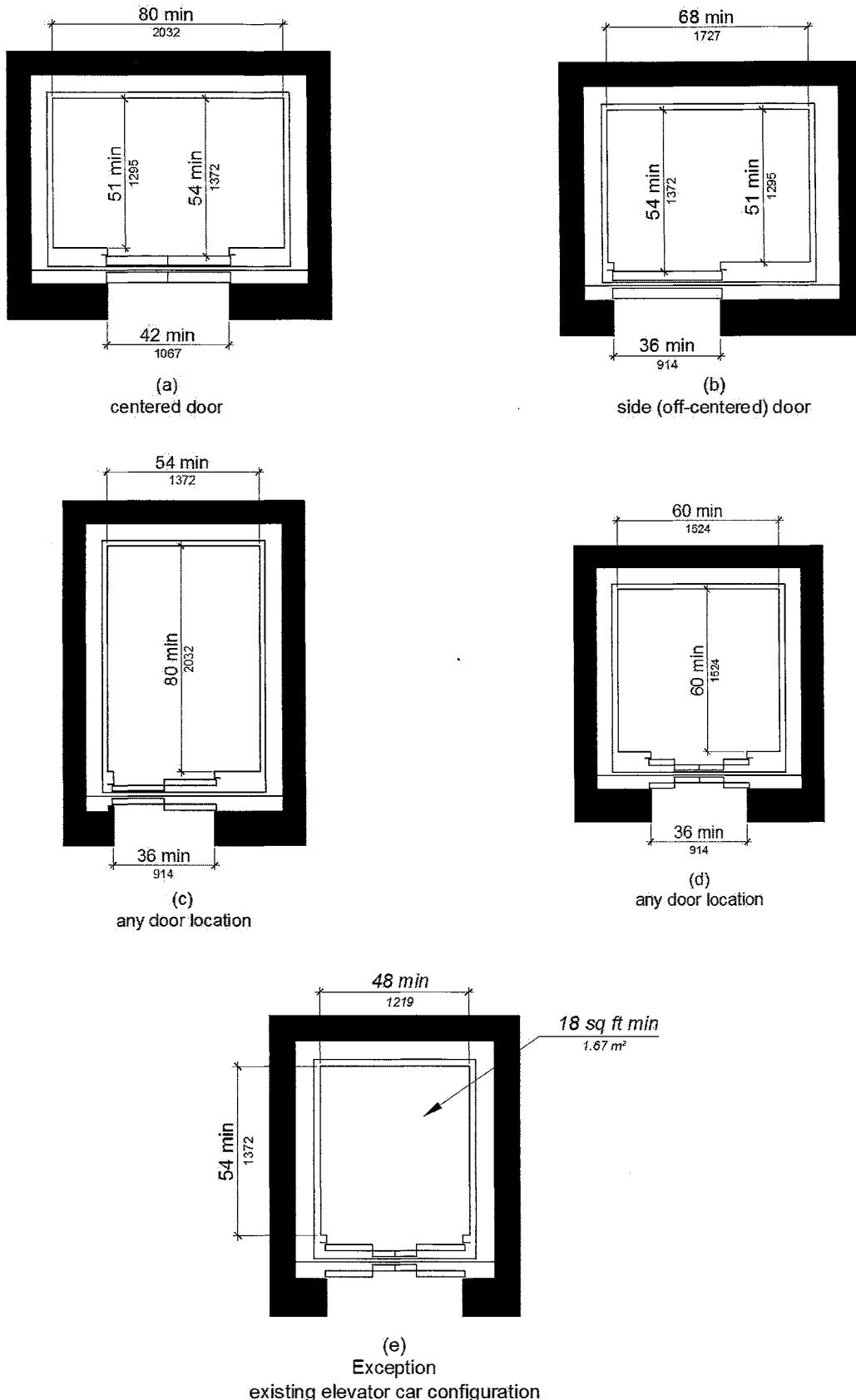


FIGURE 11B-407.4.1  
ELEVATOR CAR DIMENSIONS

**11B-407.4.8.1.3 Floor arrival.** As the car passes a floor and when a car stops at a floor served by the elevator, the corresponding character shall illuminate.

**Exception:** Reserved.

**11B-407.4.8.1.4 Reserved.**

**11B-407.4.8.2 Audible indicators.** Audible indicators shall comply with *Section 11B-407.4.8.2*.

**11B-407.4.8.2.1 Signal type.** The signal shall be an automatic verbal annunciator which announces the floor at which the car is about to stop.

**Exception:** For elevators that have a rated speed of 200 feet per minute (1 m/s) or less, a non-verbal audible signal with a frequency of 1500 Hz maximum which sounds as the car passes or is about to stop at a floor served by the elevator shall be permitted.

**11B-407.4.8.2.2 Signal level.** The verbal annunciator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the annunciator.

**11B-407.4.8.2.3 Frequency.** The verbal annunciator shall have a frequency of 300 Hz minimum to 3000 Hz maximum.

**11B-407.4.9 Emergency communication.** Emergency two-way communication systems shall comply with *Section 11B-308*. Raised symbols or characters, white on a black background, and Braille shall be provided adjacent to the device and shall comply with *Sections 11B-703.2 and 11B-703.3*. Emergency two-way communication systems between the elevator and a point outside the hoistway shall comply with ASME A17.1.

**11B-407.4.10 Support rail.** Support rails shall be provided on at least one wall of the car.

**11B-407.4.10.1 Location.** Clearance between support rails and adjacent surfaces shall be 1½ inches (38 mm) minimum. Top of support rails shall be 31 inches (787 mm) minimum to 33 inches (838 mm) maximum above the floor of the car. The ends of the support rail shall be 6 inches (152 mm) maximum from adjacent walls.

**11B-407.4.10.2 Surfaces.** Support rails shall be smooth and any surface adjacent to them shall be free of sharp or abrasive elements.

**11B-407.4.10.3 Structural strength.** Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the support rail, fastener, mounting device, or supporting structure.

**11B-408 Limited-use/limited-application elevators**

**11B-408.1 General.** Limited-use/limited-application elevators shall comply with *Section 11B-408* and with ASME A17.1. They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

**11B-408.2 Elevator landings.** Landings serving limited-use/limited-application elevators shall comply with *Section 11B-408.2*.

**11B-408.2.1 Call buttons.** Elevator call buttons and keypads shall comply with *Section 11B-407.2.1*.

**11B-408.2.2 Hall signals.** Hall signals shall comply with *Section 11B-407.2.2*.

**11B-408.2.3 Hoistway signs.** Signs at elevator hoistways shall comply with *Section 11B-407.2.3.1*.

**11B-408.3 Elevator doors.** Elevator hoistway doors shall comply with *Section 11B-408.3*.

**11B-408.3.1 Sliding doors.** Sliding hoistway and car doors shall comply with *Sections 11B-407.3.1 through 11B-407.3.3 and 11B-408.4.1*.

Control Button	Raised Symbol	Braille Message
Emergency Stop		"ST"OP Three Cells
Alarm		"AL"AR"M Four Cells
Door Open		"OP"EN" Three Cells
Door Close		CLOSE Five Cells
Main Entry Floor		MA"IN" Three Cells
Phone		"PH"ONE" Four Cells

TABLE 11B-407.4.7.1.3  
ELEVATOR CONTROL BUTTON IDENTIFICATION

**11B-408.3.2 Swinging doors.** Swinging hoistway doors shall open and close automatically and shall comply with Sections 11B-404, 11B-407.3.2 and 11B-408.3.2.

**11B-408.3.2.1 Power operation.** Swinging doors shall be power-operated and shall comply with ANSI/BHMA A156.19.

**11B-408.3.2.2 Duration.** Power-operated swinging doors shall remain open for 20 seconds minimum when activated.

**11B-408.4 Elevator cars.** Elevator cars shall comply with 11B-408.4.

**11B-408.4.1 Car dimensions and doors.** Elevator cars shall provide a clear width 42 inches (1067 mm) minimum and a clear depth 54 inches (1372 mm) minimum. Car doors shall be positioned at the narrow ends of cars and shall provide 32 inches (813 mm) minimum clear width.

**Exceptions:**

1. Cars that provide a clear width 51 inches (1295 mm) minimum shall be permitted to provide a clear depth 51 inches (1295 mm) minimum provided that car doors provide a clear opening 36 inches (914 mm) wide minimum.

**2. Reserved.**

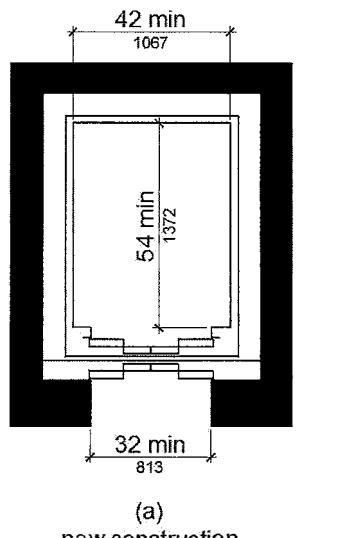
**11B-408.4.2 Floor surfaces.** Floor surfaces in elevator cars shall comply with Sections 11B-302 and 11B-303.

**11B-408.4.3 Platform to hoistway clearance.** The platform to hoistway clearance shall comply with Section 11B-407.4.3.

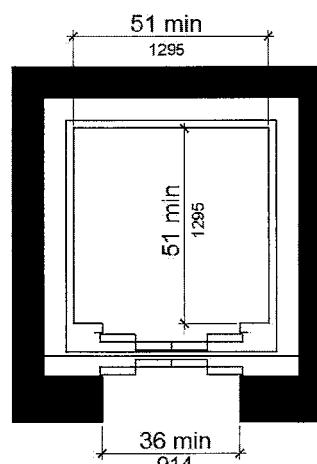
**11B-408.4.4 Leveling.** Elevator car leveling shall comply with Section 11B-407.4.4.

**11B-408.4.5 Illumination.** Elevator car illumination shall comply with Section 11B-407.4.5.

**11B-408.4.6 Car controls.** Elevator car controls shall comply with Section 11B-407.4.6. Control panels shall be centered on a side wall.



(a)  
new construction



(b)  
Exception 1

Model code  
figure not  
applicable  
  
(c)  
reserved

FIGURE 11B-408.4.1  
LIMITED-USE/LIMITED-APPLICATION (LULA) ELEVATOR CAR DIMENSIONS

**11B-409.4.1 Inside dimensions of elevator cars.** Elevator cars shall provide a clear floor space of 36 inches (914 mm) minimum by 48 inches (1219 mm) minimum and shall comply with *Section 11B-305*.

**11B-409.4.2 Floor surfaces.** Floor surfaces in elevator cars shall comply with *Sections 11B-302* and *11B-303*.

**11B-409.4.3 Platform to hoistway clearance.** The clearance between the car platform and the edge of any landing sill shall be 1½ inch (38 mm) maximum.

**11B-409.4.4 Leveling.** Each car shall automatically stop at a floor landing within a tolerance of ½ inch (12.7 mm) under rated loading to zero loading conditions.

**11B-409.4.5 Illumination levels.** Elevator car illumination shall comply with *Section 11B-407.4.5*.

**11B-409.4.6 Car controls.** Elevator car control buttons shall comply with *Sections 11B-409.4.6*, *11B-309.3*, *11B-309.4*, and shall be raised or flush.

**11B-409.4.6.1 Size.** Control buttons shall be ¾ inch (19.1 mm) minimum in their smallest dimension.

**11B-409.4.6.2 Location.** Control panels shall be on a side wall, 12 inches (305 mm) minimum from any adjacent wall.

**11B-409.4.7 Emergency communications.** Emergency two-way communication systems shall comply with *Section 11B-409.4.7*.

**11B-409.4.7.1 Type.** A telephone and emergency signal device shall be provided in the car.

**11B-409.4.7.2 Operable parts.** The telephone and emergency signaling device shall comply with *Sections 11B-309.3* and *11B-309.4*.

**11B-409.4.7.3 Compartment.** If the telephone or device is in a closed compartment, the compartment door hardware shall comply with *Section 11B-309*.

**11B-409.4.7.4 Cord.** The telephone cord shall be 29 inches (737 mm) long minimum.

#### 11B-410 Platform lifts

**11B-410.1 General.** Platform lifts shall comply with ASME A18.1. Platform lifts shall not be attendant-operated and shall provide unassisted entry and exit from the lift.

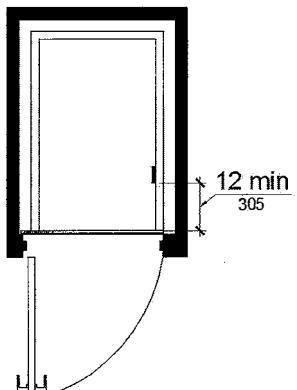


FIGURE 11B-409.4.6.2  
LOCATION OF PRIVATE RESIDENCE  
ELEVATOR CONTROL PANEL

**11B-410.2 Floor surfaces.** Floor surfaces in platform lifts shall comply with *Sections 11B-302* and *11B-303*.

**11B-410.3 Clear floor space.** Clear floor space in platform lifts shall comply with *Section 11B-305*.

**11B-410.4 Platform to runway clearance.** The clearance between the platform sill and the edge of any runway landing shall be 1¼ inch (32 mm) maximum.

**11B-410.5 Operable parts.** Controls for platform lifts shall comply with *Section 11B-309*.

**11B-410.6 Doors and gates.** Platform lifts shall have low-energy power-operated doors or gates complying with *Section 11B-404.3*. Doors shall remain open for 20 seconds minimum. End doors and gates shall provide a clear width 32 inches (813 mm) minimum. Side doors and gates shall provide a clear width 42 inches (1067 mm) minimum.

**Exception:** Platform lifts serving two landings maximum and having doors or gates on opposite sides shall be permitted to have self-closing manual doors or gates.

**11B-410.7 Landing size.** The minimum size of landings at platform lifts shall be 60 inches by 60 inches (1524 mm by 1524 mm).

**11B-410.8 Restriction sign.** A sign complying with *Section 11B-703.5* shall be posted in a conspicuous place at each landing and within the platform enclosure stating "No Freight" and include the International Symbol of Accessibility complying with *Section 11B-703.7.2.1*.

#### 11B-411 Destination-oriented elevators

**11B-411.1 General.** Destination-oriented elevators shall comply with *Section 11B-411* and with ASME A17.1. They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

**11B-411.1.1 Floor designations.** In facilities served by destination-oriented elevator systems, floor designations shall be numeric characters only. Floor designations shall be "one" (1) or "zero" (0) at the main entry level and shall increase by one for each successive higher story or level. The initial floor below the main entry level shall be designated "minus one" (-1) and

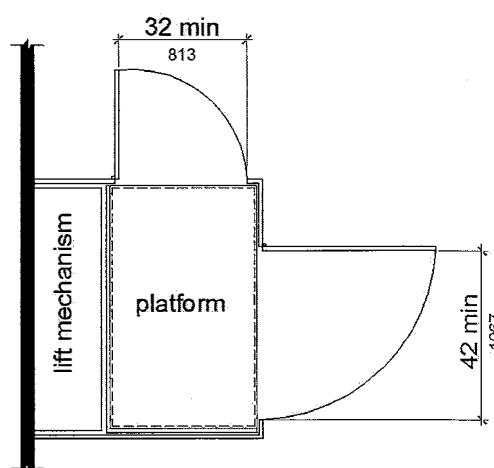


FIGURE 11B-410.6  
PLATFORM LIFT DOORS AND GATES

the designation for each successive lower story or level shall decrease by one. Stories or levels shall not be designated by alphabetic characters.

**Exceptions:**

1. In existing facilities where new elevators are installed or existing elevators are altered into a destination-oriented elevator system, levels within stories, such as mezzanines located above or below the main entry level shall be permitted to be designated with an alpha-numeric character such as "M2", indicating "mezzanine" and the "story number", respectively, in which it is located, provided there is no duplication with alpha-numeric designations of elevator cars in the facility.
2. Non-successive floor numbering shall be permitted where a specific floor number is omitted or where a floor is frequented only by service personnel for maintenance, repair or occasional monitoring of equipment.

**11B-411.1.2 Car designations.** Elevator cars shall be designated with a single alphabetic character.

**Exception:** Elevator systems with more than 26 elevators shall be permitted to use alpha-numeric designations such as "A1."

**11B-411.2 Elevator landing requirements.** Elevator landings shall comply with Section 11B-411.2.

**11B-411.2.1 Hall call consoles.** Hall call consoles shall comply with Sections 11B-411.2.1 and 11B-309.

**11B-411.2.1.1 Location.** Hall call consoles shall be wall-mounted. On floors with a building entry, including parking and transfer levels, each hoistway entrance shall be adjacent to a hall call console. On other floors, a minimum of one hoistway entrance shall be adjacent to a hall call console.

**Exception:** Hall call consoles beyond those required by Section 11B-411.2.1.1 shall be permitted to be provided outside the elevator landing and to be wall-mounted, pedestal-mounted, or mounted on a kiosk or security turnstile.

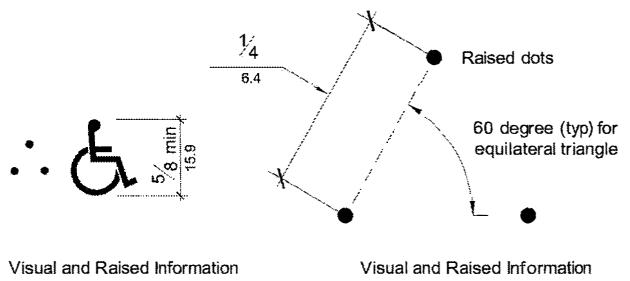
**11B-411.2.1.2 Required features.** Hall call consoles shall include a touch screen or keypad with display screen, an accessibility function button, and audio output loudspeaker.

**11B-411.2.1.2.1 Keypads.** Keypads shall be in a 12-key ascending telephone keypad layout. Characters and symbols shall be centered on the corresponding button. The number five key shall have a single raised dot. The dot shall have a base diameter of 0.118 inch (3 mm) minimum and 0.120 inch (3.05 mm) maximum and a height of 0.025 inch (0.6 mm) minimum and 0.037 inch (0.9 mm) maximum. Keypads shall have a star ( $\star$ ) on the lower left button and a minus sign (-) on the lower right button. From any level above and below the main egress level, when the star

button is pressed an elevator shall be dispatched to the main egress level.

**11B-411.2.1.2.2 Touch screen.** Touch screen display shall comply with Section 11B-411.2.1.2.4. The touch screen shall provide written or visual instruction on the screen as to its use.

**11B-411.2.1.2.3 Accessibility function button.** The accessibility function button shall be identified by the International Symbol of Accessibility and a raised indication. The International Symbol of Accessibility shall comply with Section 11B-703.7.2.1, and shall be  $\frac{5}{8}$  inch (15.9 mm) minimum in height. The indication shall be three raised dots. Each dot shall have a base diameter of 0.059 inch (1.5 mm) minimum and 0.063 inch (1.6 mm) maximum and a height of 0.025 inch (0.6 mm) minimum and 0.037 inch (0.9 mm) maximum. The dots shall be spaced  $\frac{1}{4}$  inch (6.4 mm), measured center to center, in the form of an equilateral triangle with a vertex pointing up. The accessibility function button shall not be provided with a key repeat function.



**FIGURE 11B-411.2.1.2.3  
DESTINATION-ORIENTED ELEVATOR  
ACCESSIBILITY FUNCTION BUTTON INDICATION**

**11B-411.2.1.2.4 Display screen.** Upon activation of the accessibility function button, the display screen shall display information on the location and use of the star ( $\star$ ) and minus sign (-) buttons, user input confirmation, elevator assignment characters, direction to the assigned elevator, and error messages. The display screen shall comply with Section 11B-411.2.1.2.4.

**11B-411.2.1.2.4.1 Contrast.** Display screens shall provide contrast with light characters and symbols on a dark background or dark characters and symbols on a light background. The background shall be solid and static.

**11B-411.2.1.2.4.2 Size.** Elevator assignment characters shall be 1 inch high (25 mm) minimum.

**11B-411.2.1.2.4.3 Duration.** Elevator assignment characters shall be displayed for a minimum of 5 seconds.

**11B-411.2.1.2.5 Audio output.** Upon activation of the accessibility function button, the audio output shall provide verbal announcements of oper-

ating instructions, location and use of the star (☆) and minus sign (-) buttons, user input confirmation, announcement of the elevator assignment characters, direction to the assigned elevator, and error messages. Audio output shall be recorded or digitized human speech, and shall be delivered through a loudspeaker. Auditory volume shall be at least 10 dB above ambient sound level, but shall not exceed 80 dB, measured 36 inches (914 mm) in front of the console. At hall call console locations where the ambient sound level varies, auditory volume shall be maintained at the required volume by an automatic gain control or shall be set at not less than 75 dB.

**11B-411.2.1.3 Arrangement.** Hall call console arrangement of required features shall comply with Section 11B-411.2.1.3.

**11B-411.2.1.3.1 Keypad call console arrangement.** Where keypad call consoles are provided, the display screen shall be located directly above the keypad. The accessibility function button shall be located directly below the keypad at a height of 36 inches (914 mm) to 42 inches (1067 mm) above the finish floor.

**11B-411.2.1.3.2 Touch screen call console arrangement.** Where touch screen call consoles are provided, the touch screen shall be located directly above the accessibility function button. The accessibility function button shall be located at a height of 36 inches (914 mm) to 42 inches (1067 mm) above the finish floor.

**11B-411.2.1.3.3 Proximity of required elements.** Required features shall be provided on a hall call console assembly or as individual elements grouped in close proximity.

**11B-411.2.1.3.4 Position.** The face of individual elements or group of individual elements that are operated by user input shall slope away from the user at 15 to 25 degrees from the vertical plane. The face of hall call console assemblies and the face of touch screens shall be sloped away from the user at 7 to 25 degrees from the vertical plane. Display screens and touch screens shall be positioned so glare is reduced on the screen.

**11B-411.2.1.4 Additional features.** Hall call console additional features, if provided, shall comply with Sections 11B-309 and 11B-411.2.1.4.

**11B-411.2.1.4.1 Hall call console additional buttons.** Hall call console buttons provided in addition to the accessibility function button and keypad buttons shall comply with Section 11B-411.2.1.4.1. Buttons in addition to the accessibility function button are not permitted on hall call consoles using a touch screen.

**11B-411.2.1.4.1.1 Arrangement.** Buttons shall be arranged in columns to the right of the keypad with a minimum horizontal spacing

of 1.5 times the horizontal spacing between the numeric keys and with the same vertical spacing as the numeric keys.

**11B-411.2.1.4.1.2 Identification.** Buttons shall be identified by raised characters and symbols, white on a black background, complying with Section 11B-703.2 and Braille complying with Section 11B-703.3. Identification shall be placed immediately to the left of the control button to which the designation applies.

**11B-411.2.1.4.2 Security or access controls.** Security or access control system card readers associated with elevator operation shall be in close proximity to each hall call console in a consistent manner throughout the facility.

**11B-411.2.1.5 Button requirements.** Keypad buttons, the accessibility function button, and additional hall call console buttons shall comply with Section 11B-411.2.1.5.

**11B-411.2.1.5.1 Size.** Buttons shall have square shoulders, be  $\frac{3}{4}$  inch (19.1 mm) minimum in the smallest dimension and shall be raised  $\frac{1}{8}$  inch (3.2 mm) plus or minus  $\frac{1}{32}$  inch (0.8 mm) above the surrounding surface. The buttons shall be activated by a mechanical motion that is detectable.

**11B-411.2.1.5.2 Color.** Characters and symbols on buttons, where provided, shall be white on a black background.

**11B-411.2.1.6 Identification of floors served.** In buildings with two or more elevator banks, each serving a different group of specific floors, hall call consoles located on floors with a building entry, including parking and transfer levels, shall be provided with signage complying with Sections 11B-703.2, 11B-703.3, and 11B-703.5 on the surface of or above the hall call console stating "FLOORS n1 - n2," where n1 - n2 represents the range of floors served. Characters shall be white on a black background. When the accessibility function button is pressed, the audio output shall provide a verbal announcement of the floors served by the elevator group.

**11B-411.2.1.7 Elevator car assignment.** When the accessibility function button is pressed, elevator car assignment shall comply with Section 11B-411.2.1.7.

**11B-411.2.1.7.1 Assignment by keypad hall call console.** The audio output shall provide verbal instruction for the user to enter a destination floor. The selected destination floor shall be confirmed by verbal announcement and on the display screen. Verbal and visible indication of an invalid input shall be provided. The display screen shall indicate the elevator assignment characters and a verbal announcement shall be made of the assigned elevator responding to the

*call. Visual and verbal direction to the assigned elevator shall be provided.*

**11B-411.2.1.7.2 Assignment by touch screen hall call console.** The audio output shall provide verbal instruction for the user to press the accessibility function button as a response to verbal direction in order to select the destination floor. The selected destination floor shall be confirmed by verbal announcement and on the display screen. Verbal and visible indication of an invalid input shall be provided. The display screen shall indicate the elevator assignment characters and a verbal announcement shall be made of the assigned elevator responding to the call. Visual and verbal direction to the assigned elevator shall be provided.

**Exception.** In addition to assignment by Section 11B-411.2.1.7.2, a verbal announcement providing the user with an option to select an alternative mode of operation shall be permitted. Alternative operation shall be by one of the following options:

1. **Virtual keypad.** The size of the keypad shall be a nominal 4 inches (102 mm) wide by 5 inches (127 mm) high in a 12-key ascending telephone keypad layout centered in the console. Characters and symbols shall be centered on the corresponding button. Keypads shall have a star (★) on the lower left button and a minus sign (-) on the lower right button. Operation shall be by contact with the touch screen with a press on the key. The audio output shall provide user input confirmation after each key is pressed. Keys shall not be provided with a key repeat function. From any level above and below the main egress level, when the star button is pressed an elevator shall be dispatched to the main egress level.
2. **Gesture-based mode of operation.** Operation shall be by contact with the touch screen, without specific contact with an icon, and using established non-proprietary gestures for selection and input, including but not limited to tapping, sliding, and tap-hold contact-release to select. The audio output shall provide verbal direction on use of the touch screen, and indication of floor selection options until assignment to the elevator is given.

**11B-411.2.1.7.3 Assignment by security credential.** If a security system or other form of access control system is provided, the audio output shall provide a verbal announcement and direction to

*the location of the access control activation sensor, such as "present security credential at the sensor immediately to the left." Upon presentation of security credential, the destination floor shall be confirmed by verbal announcement and on the display screen. The display screen shall indicate the elevator assignment characters and a verbal announcement shall be made of the assigned elevator responding to the call. Visual and verbal direction to the assigned elevator shall be provided.*

**11B-411.2.1.7.4 Adjacency assignment.** The system shall assign an elevator car immediately to the left or right of the hall call console.

**Exception:** The most adjacent elevator serving the selected floor shall be assigned by hall call consoles located outside the elevator landing.

**11B-411.2.2 Elevator car identification at elevator landings.** Elevator car identification shall comply with Section 11B-411.2.2.

**11B-411.2.2.1 Visible identification.** Above or adjacent to each elevator car entrance there shall be a visible identification fixture with a car designation character. The identification fixture shall be 80 inches (2032 mm) minimum above the finish floor or ground to the bottom of the fixture. The characters on the fixture shall be upper case with a height of 4 inches (102 mm) minimum complying with Sections 11B-703.5.1, 11B-703.5.3, 11B-703.5.4, 11B-703.5.7, and 11B-703.5.8.

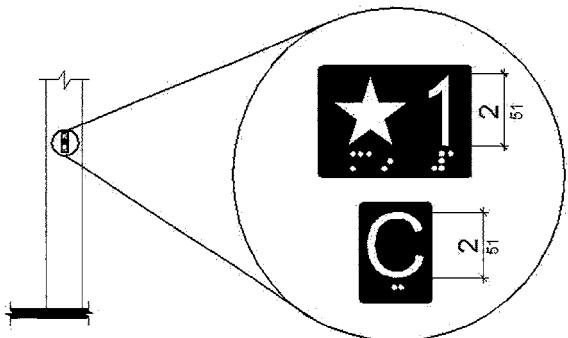
**Exception:** Existing buildings shall be permitted to have a visible identification fixture with a car designation character adjacent to each elevator car entrance centered at 72 inches (1829 mm) above the finish floor or ground. The character on the fixture shall be upper case with a height of 2½ inches (64 mm) minimum complying with Sections 11B-703.5.1, 11B-703.5.3, 11B-703.5.4, 11B-703.5.7, and 11B-703.5.8.

**11B-411.2.2.2 Verbal identification.** When the accessibility function button is pressed, verbal announcement of the car designation shall be provided at the elevator car entrance upon arrival. Audio output shall be recorded or digitized human speech, and shall be delivered through a loudspeaker. The verbal annunciator shall have a frequency of 300 Hz minimum and 3000 Hz maximum. Auditory volume shall be at least 10 dB above ambient sound level, but shall not exceed 80 dB, measured 36 inches (914 mm) in front of the elevator entrance and at 48 inches (1219 mm) above the floor. At elevator entrances where the ambient sound level varies, auditory volume shall be maintained at the required volume by an automatic gain control or shall be set at not less than 75 dB.

**11B-411.2.3 Signs on jambs of elevator hoistway entrances.** Signs on jambs of elevator hoistway entrances shall comply with Section 11B-411.2.3.

**11B-411.2.3.1 Floor designation signs.** Floor designation signs complying with Sections 11B-703.2 and 11B-703.4.1 shall be provided on both jambs of elevator hoistway entrances. Signs shall be provided in both raised characters and Braille. Raised characters shall be 2 inches (51 mm) high. A raised star placed to the left of the floor designation, shall be provided on both jambs at the main entry level. The outside diameter of the star shall be 2 inches (51 mm) and all points shall be of equal length. Raised characters, including the star, shall be white on a black background. Braille complying with Section 11B-703.3 shall be placed below the corresponding raised characters and the star. The Braille translation for the star shall be "MAIN". Applied plates are acceptable if they are permanently fixed to the jamb.

**11B-411.2.3.2 Car designation signs.** Car designation signs complying with Sections 11B-703.2 and 11B-703.4.1 shall be provided on both jambs of the hoistway immediately below the floor designation. Signs shall be provided in both raised characters and Braille. Raised characters shall be 2 inches (51 mm) high. Raised characters shall be white on a black background. Braille complying with Section 11B-703.3 shall be placed below the corresponding raised characters. Applied plates are acceptable if they are permanently fixed to the jamb.



**FIGURE 11B-411.2.3**  
FLOOR DESIGNATION AND CAR DESIGNATION SIGNS ON JAMBS OF DESTINATION-ORIENTED ELEVATOR HOISTWAY SIGNS

**11B-411.3 Elevator door requirements.** Hoistway and car doors shall comply with Section 11B-411.3.

**11B-411.3.1 Type.** Elevator door type shall comply with Section 11B-407.3.1.

**11B-411.3.2 Operation.** Elevator hoistway and car doors shall open and close automatically.

**11B-411.3.3 Reopening device.** Elevator doors shall be provided with a reopening device complying with Section 11B-411.3.3 that shall stop and reopen a car door and

hoistway door automatically if the door becomes obstructed by an object or person.

**11B-411.3.3.1 Height.** The height of the reopening device shall comply with Section 11B-407.3.3.1.

**11B-411.3.3.2 Contact.** The device contact shall comply with Section 11B-407.3.3.2.

**11B-411.3.3.3 Duration.** The door reopening device duration shall comply with Section 11B-407.3.3.3.

**11B-411.3.4 Door delay.** Door delay shall comply with Section 11B-407.3.5.

**11B-411.3.5 Width.** The width of elevator doors shall comply with Table 11B-407.4.1.

**11B-411.4 Elevator car requirements.** Elevator cars shall comply with Section 11B-411.4.

**11B-411.4.1 Car dimensions.** Inside dimensions of elevator cars and clear width of elevator doors shall comply with Section 11B-407.4.1.

**11B-411.4.2 Floor surfaces.** Floor surfaces in elevator cars shall comply with Section 11B-407.4.2.

**11B-411.4.3 Platform to hoistway clearance.** Platform to hoistway clearance shall comply with Section 11B-407.4.3.

**11B-411.4.4 Leveling.** Elevator car leveling shall comply with Section 11B-407.4.4.

**11B-411.4.5 Illumination.** The level of illumination at the car controls shall comply with Section 11B-407.4.5.

**11B-411.4.6 Elevator car controls.** Where provided, elevator car controls shall comply with Sections 11B-411.4.6 and 11B-309.4.

**11B-411.4.6.1 Location.** Controls shall be located within one of the reach ranges specified in Section 11B-308.

**11B-411.4.6.2 Buttons.** Car control buttons shall comply with Sections 11B-407.4.6.2.1 and 11B-407.4.6.2.4. The car shall not have non-functional, exposed floor buttons.

**11B-411.4.6.3 Emergency controls.** Emergency controls shall comply with Section 11B-407.4.6.4.

**11B-411.4.7 Designations and indicators of car control buttons.** Designations and indicators of car control buttons shall comply with Section 11B-411.4.7.

**11B-411.4.7.1 Type.** Control button type shall comply with Section 11B-407.4.7.1.1.

**11B-411.4.7.2 Location.** Raised characters or symbols and Braille designations shall comply with Section 11B-407.4.7.1.2.

**11B-411.4.7.3 Symbols.** The control button for the emergency stop, alarm, door open, door close, and phone, shall be identified with raised symbols and Braille as shown in Table 11B-407.4.7.1.3.

**11B-411.4.7.4 Button spacing.** Button spacing shall comply with Section 11B-407.4.7.1.5.

**11B-411.4.8 Car position indicators.** Audible and visible car position indicators shall be provided in elevator cars.

**11B-411.4.8.1 Visible indicators.** Visible indicators shall comply with Section 11B-411.4.8.1.

**11B-411.4.8.1.1 Size.** Characters shall comply with Section 11B-407.4.8.1.1.

**11B-411.4.8.1.2 Location.** Location of indicators shall comply with Section 11B-407.4.8.1.2.

**11B-411.4.8.2 Audible indicators.** Audible indicators shall comply with Section 11B-411.4.8.2.

**11B-411.4.8.2.1 Signal type.** The signal shall be an automatic verbal annunciator which announces the floor at which the car is about to stop.

**11B-411.4.8.2.2 Signal level.** The verbal annunciator signal level shall comply with Section 11B-407.4.8.2.2.

**11B-411.4.8.2.3 Frequency.** The verbal annunciator frequency shall comply with Section 11B-407.4.8.2.3.

**11B-411.4.9 Emergency communication.** Emergency communication shall comply with Section 11B-407.4.9.

**11B-411.4.10 Support rail.** Support rails complying with Section 11B-407.4.10 shall be provided on at least one wall of the car.

**11B-411.4.11 Floor destination indicators.** There shall be on each elevator car door jamb a visual display indicating floor destinations.

**11B-411.4.11.1 Height.** Floor destination characters shall be 1 inch (25 mm) high minimum complying with Section 11B-703.5.3.

**11B-411.4.11.2 Contrast.** Visual display shall provide contrast with light characters on a dark background or dark characters on a light background. The background shall be solid and static.

**11B-411.4.11.3 Duration.** Floor destination characters shall be displayed upon elevator car arrival at the input floor and shall not extinguish until the elevator car arrives at the destination floor.

## DIVISION 5: GENERAL SITE AND BUILDING ELEMENTS

### **11B-501 General**

**11B-501.1 Scope.** The provisions of *Division 5* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

### **11B-502 Parking spaces**

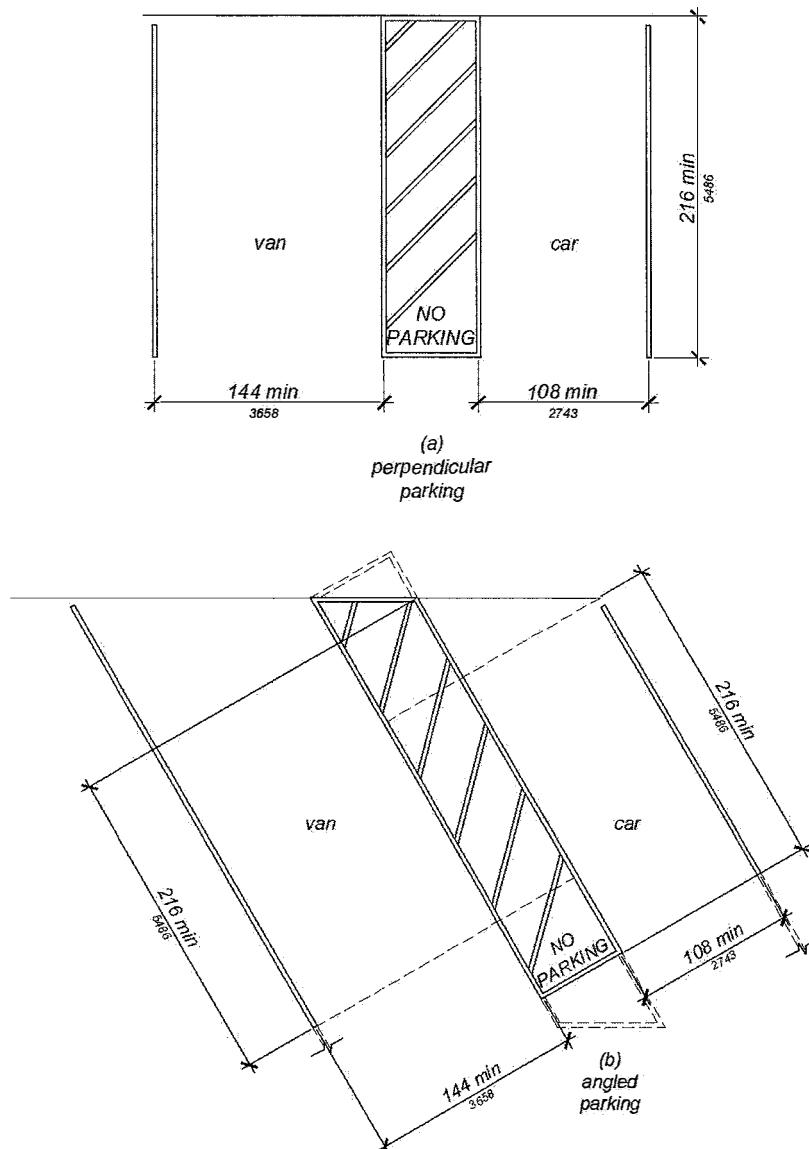
**11B-502.1 General.** Car and van parking spaces shall comply with *Section 11B-502*. Where parking spaces are marked with lines, width measurements of parking spaces and access aisles shall be made from the centerline of the markings.

**Exception:** Where parking spaces or access aisles are not adjacent to another parking space or access aisle, measure-

ments shall be permitted to include the full width of the line defining the parking space or access aisle.

**11B-502.2 Vehicle spaces.** *Car and van parking spaces shall be 216 inches (5486 mm) long minimum. Car parking spaces shall be 108 inches (2743 mm) wide minimum and van parking spaces shall be 144 inches (3658 mm) wide minimum, shall be marked to define the width, and shall have an adjacent access aisle complying with *Section 11B-502.3*.*

**Exception:** Van parking spaces shall be permitted to be 108 inches (2743 mm) wide minimum where the access aisle is 96 inches (2438 mm) wide minimum.



**FIGURE 11B-502.2  
VEHICLE PARKING SPACES**

**11B-502.3 Access aisle.** Access aisles serving parking spaces shall comply with Section 11B-502.3. Access aisles shall adjoin an accessible route. Two parking spaces shall be permitted to share a common access aisle.

**11B-502.3.1 Width.** Access aisles serving car and van parking spaces shall be 60 inches (1524 mm) wide minimum.

**11B-502.3.2 Length.** Access aisles shall extend the full required length of the parking spaces they serve.

**11B-502.3.3 Marking.** Access aisles shall be marked with a blue painted borderline around their perimeter. The area within the blue borderlines shall be marked with

hatched lines a maximum of 36 inches (914 mm) on center in a color contrasting with that of the aisle surface, preferably blue or white. The words "NO PARKING" shall be painted on the surface within each access aisle in white letters a minimum of 12 inches (305 mm) in height and located to be visible from the adjacent vehicular way. Access aisle markings may extend beyond the minimum required length.

**11B-502.3.4 Location.** Access aisles shall not overlap the vehicular way. Access aisles shall be permitted to be placed on either side of the parking space except for van parking spaces which shall have access aisles located on the passenger side of the parking spaces.

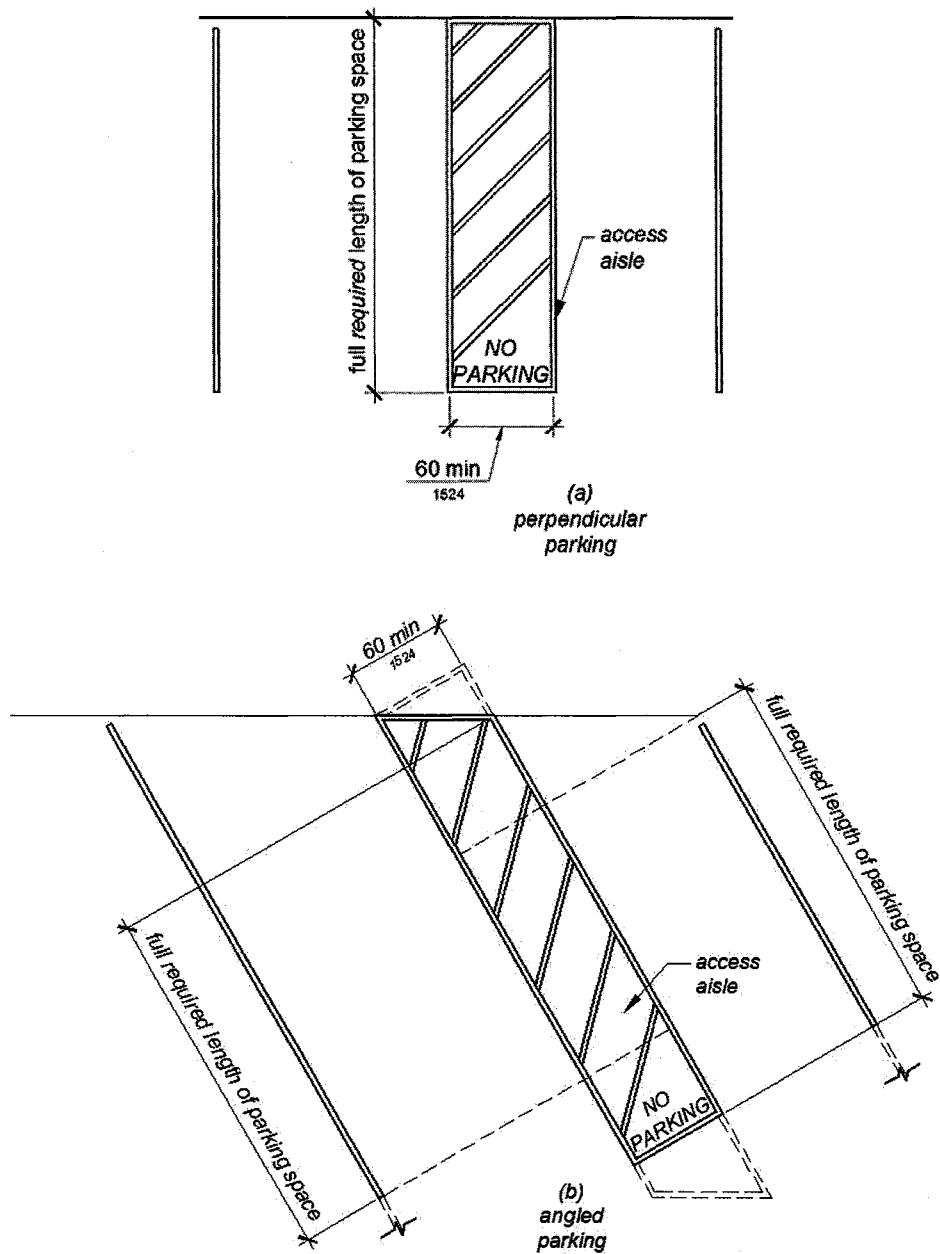
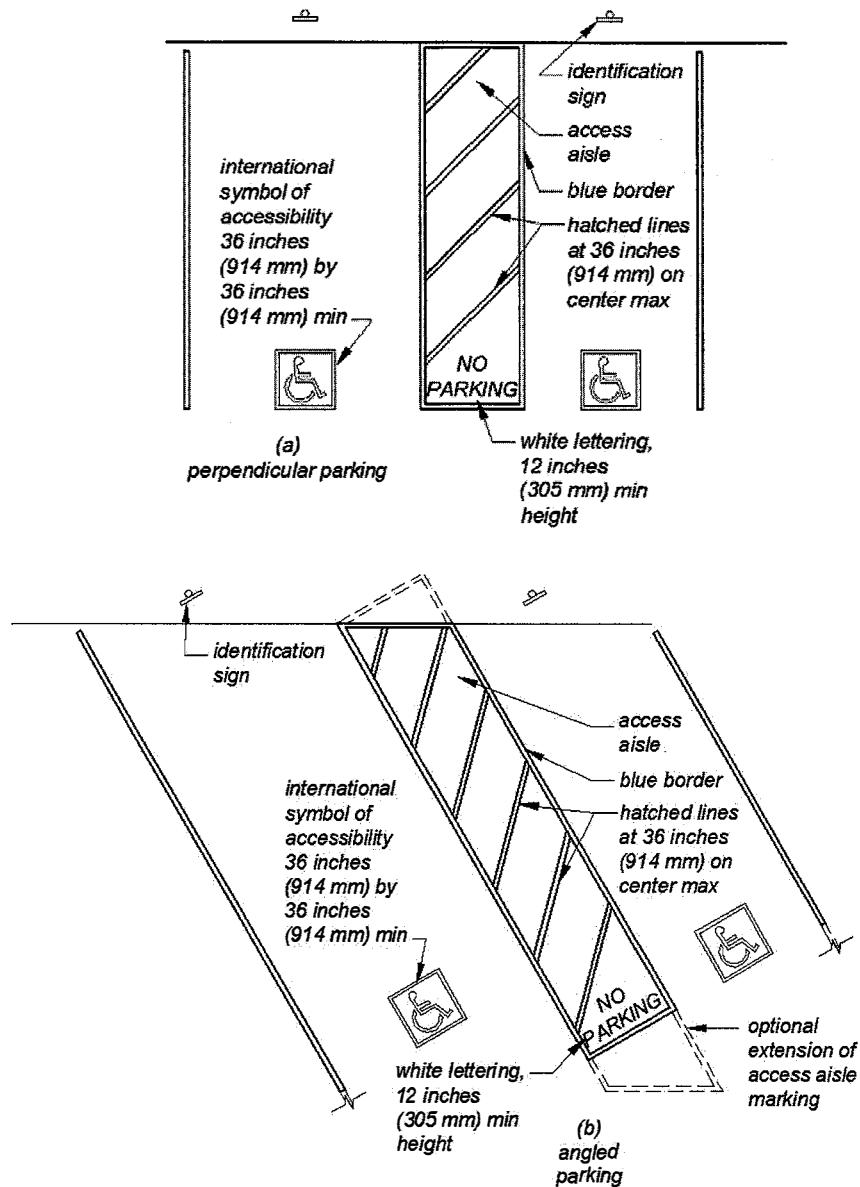


FIGURE 11B-502.3  
PARKING SPACE ACCESS AISLE



**FIGURE 11B-502.3.3  
ANGLED AND PERPENDICULAR PARKING IDENTIFICATION**

**11B-502.4 Floor or ground surfaces.** Parking spaces and access aisles serving them shall comply with Section 11B-302. Access aisles shall be at the same level as the parking spaces they serve. Changes in level are not permitted.

**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-502.5 Vertical clearance.** Parking spaces, access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2489 mm) minimum.

**11B-502.6 Identification.** Parking space identification signs shall include the International Symbol of Accessibility complying with Section 11B-703.7.2.1. Signs identifying van parking spaces shall contain *additional language or an additional sign with the designation "van accessible."* Signs shall

be 60 inches (1524 mm) minimum above the finish floor or ground surface measured to the bottom of the sign.

**Exception:** Signs located within an accessible route shall be a minimum of 80 inches (2032 mm) above the finish floor or ground surface measured to the bottom of the sign.

**11B-502.6.1 Finish and size.** Parking identification signs shall be reflectorized with a minimum area of 70 square inches (45,161 mm<sup>2</sup>).

**11B-502.6.2 Minimum fine.** Additional language or an additional sign below the International Symbol of Accessibility shall state "Minimum Fine \$250."

**11B-502.6.3 Location.** A parking space identification sign shall be visible from each parking space. Signs shall be

permanently posted either immediately adjacent to the parking space or within the projected parking space width at the head end of the parking space. Signs may also be permanently posted on a wall at the interior end of the parking space.

**11B-502.6.4 Marking.** Each accessible car and van space shall have surface identification complying with either Section 11B-502.6.4.1 or 11B-502.6.4.2.

**11B-502.6.4.1** The parking space shall be marked with an International Symbol of Accessibility complying with Section 11B-703.7.2.1 in white on a blue background a minimum 36 inches wide by 36 inches high (914 mm by 914 mm). The centerline of the International Symbol of Accessibility shall be a maximum of 6 inches (152 mm) from the centerline of the parking space, its sides parallel to the length of the parking space and its lower corner at, or lower side aligned with, the end of the parking space length.

**11B-502.6.4.2** The parking space shall be outlined or painted blue and shall be marked with an International Symbol of Accessibility complying with Section 11B-703.7.2.1 a minimum 36 inches wide by 36 inches high (914 mm by 914 mm) in white or a suitable contrasting color. The centerline of the International Symbol of Accessibility shall be a maximum of 6 inches (152 mm) from the centerline of the parking space, its sides parallel to the length of the parking space and its lower corner at, or lower side aligned with, the end of the parking space.

**11B-502.7 Relationship to accessible routes.** Parking spaces and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent accessible routes.

**11B-502.7.1 Arrangement.** Parking spaces and access aisles shall be designed so that persons using them are not required to travel behind parking spaces other than to pass behind the parking space in which they parked.

**11B-502.7.2 Wheel stops.** A curb or wheel stop shall be provided if required to prevent encroachment of vehicles over the required clear width of adjacent accessible routes.

**11B-502.8 Additional signage.** An additional sign shall be posted either; 1) in a conspicuous place at each entrance to an off-street parking facility or 2) immediately adjacent to on-site accessible parking and visible from each parking space.

**11B-502.8.1 Size.** The additional sign shall not be less than 17 inches (432 mm) wide by 22 inches (559 mm) high.

**11B-502.8.2 Lettering.** The additional sign shall clearly state in letters with a minimum height of 1 inch (25 mm) the following:

"Unauthorized" vehicles parked in designated accessible spaces not displaying distinguishing placards or special license plates issued for persons with disabilities will be towed away at the owner's expense. Towed vehicles may

be reclaimed at: \_\_\_\_\_ or by telephoning \_\_\_\_\_."

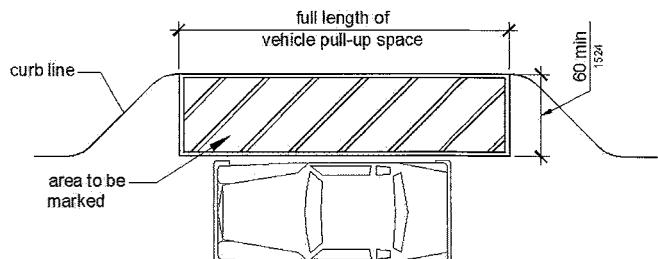
Blank spaces shall be filled in with appropriate information as a permanent part of the sign.

#### **11B-503 Passenger drop-off and loading zones**

**11B-503.1 General.** Passenger drop-off and loading zones shall comply with Section 11B-503.

**11B-503.2 Vehicle pull-up space.** Passenger drop-off and loading zones shall provide a vehicular pull-up space 96 inches (2438 mm) wide minimum and 20 feet (6096 mm) long minimum.

**11B-503.3 Access aisle.** Passenger drop-off and loading zones shall provide access aisles complying with Section 11B-503 adjacent and parallel to the vehicle pull-up space. Access aisles shall adjoin an accessible route and shall not overlap the vehicular way.



**FIGURE 11B-503.3  
PASSENGER DROP-OFF AND LOADING ZONE ACCESS AISLE**

**11B-503.3.1 Width.** Access aisles serving vehicle pull-up spaces shall be 60 inches (1524 mm) wide minimum.

**11B-503.3.2 Length.** Access aisles shall extend the full length of the vehicle pull-up spaces they serve.

**11B-503.3.3 Marking.** Access aisles shall be marked with a painted borderline around their perimeter. The area within the borderlines shall be marked with hatched lines a maximum of 36 inches (914 mm) on center in a color contrasting with that of the aisle surface.

**11B-503.4 Floor and ground surfaces.** Vehicle pull-up spaces and access aisles serving them shall comply with Section 11B-302. Access aisles shall be at the same level as the vehicle pull-up space they serve. Changes in level are not permitted.

**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-503.5 Vertical clearance.** Vehicle pull-up spaces, access aisles serving them, and a vehicular route from an entrance to the passenger loading zone and from the passenger loading zone to a vehicular exit shall provide a vertical clearance of 114 inches (2896 mm) minimum.

**11B-503.6 Identification.** Each passenger loading zone designated for persons with disabilities shall be identified with a reflectorized sign complying with Section 11B-703.5. It shall be permanently posted immediately adjacent to and visible from the passenger loading zone stating "Passenger Loading

*Zone Only" and including the International Symbol of Accessibility complying with Section 11B-703.7.2.1 in white on a dark blue background.*

#### 11B-504 Stairways

**11B-504.1 General.** Stairs shall comply with Section 11B-504.

**11B-504.2 Treads and risers.** All steps on a flight of stairs shall have uniform riser heights and uniform tread depths. Risers shall be 4 inches (102 mm) high minimum and 7 inches (178 mm) high maximum. Treads shall be 11 inches (279 mm) deep minimum.

**Exception:** Curved stairways with winder treads are permitted at stairs which are not part of a required means of egress.

**11B-504.3 Open risers.** Open risers are not permitted.

**Exceptions:**

1. On exterior stairways, an opening of not more than  $\frac{1}{2}$  inch (12.7 mm) may be permitted between the base of the riser and the tread.
2. On exterior stairways, risers constructed of grating containing openings of not more than  $\frac{1}{2}$  inch (12.7 mm) may be permitted.

**11B-504.4 Tread surface.** Stair treads shall comply with Section 11B-302. Changes in level are not permitted.

**Exception:** Treads shall be permitted to have a slope not steeper than 1:48.

**11B-504.4.1 Contrasting stripe.** Interior stairs shall have the upper approach and lower tread marked by a stripe providing clear visual contrast. Exterior stairs shall have the upper approach and all treads marked by a stripe providing clear visual contrast.

The stripe shall be a minimum of 2 inches (51 mm) wide to a maximum of 4 inches (102 mm) wide placed parallel to, and not more than 1 inch (25 mm) from, the nose of the step or upper approach. The stripe shall extend the full width of the step or upper approach and shall be of material that is at least as slip resistant as the other treads of the stair. A painted stripe shall be acceptable. Grooves shall not be used to satisfy this requirement.

**11B-504.5 Nosings.** The radius of curvature at the leading edge of the tread shall be  $\frac{1}{2}$  inch (12.7 mm) maximum. Nosings that project beyond risers shall have the underside of the leading edge curved or beveled. Risers shall be permitted to slope under the tread at an angle of 30 degrees maximum from vertical. The permitted projection of the nosing shall extend  $1\frac{1}{4}$  inches (32 mm) maximum over the tread below.

**Exception:** In existing buildings there is no requirement to retroactively alter existing nosing projections of  $1\frac{1}{2}$  inches (38 mm) which were constructed in compliance with the building code in effect at the time of original construction.

**11B-504.6 Handrails.** Stairs shall have handrails complying with Section 11B-505.

**11B-504.7 Wet conditions.** Stair treads and landings subject to wet conditions shall be designed to prevent the accumulation of water.

**11B-504.8 Floor identification.** Floor identification signs required by Chapter 10, Section 1022.9 complying with Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5 shall be located at the landing of each floor level, placed adjacent to the door on the latch side, in all enclosed stairways in buildings two or more stories in height to identify the floor level. At the exit discharge level, the sign shall include a raised five pointed star located to the left of the identifying floor level. The outside diameter of the star shall be the same as the height of the raised characters.

#### 11B-505 Handrails

**11B-505.1 General.** Handrails provided along walking surfaces complying with Section 11B-403, required at ramps complying with Section 11B-405, and required at stairs complying with Section 11B-504 shall comply with Section 11B-505.

**11B-505.2 Where required.** Handrails shall be provided on both sides of stairs and ramps.

**Exceptions:**

1. In assembly areas, handrails shall not be required on both sides of aisle ramps where a handrail is provided at either side or within the aisle width.
2. Curb ramps do not require handrails.
3. At door landings, handrails are not required when the ramp run is less than 6 inches (152 mm) in rise or 72 inches (1829 mm) in length.

**11B-505.3 Continuity.** Handrails shall be continuous within the full length of each stair flight or ramp run. Inside handrails on switchback or dogleg stairs and ramps shall be continuous between flights or runs.

**Exception:** In assembly areas, ramp handrails adjacent to seating or within the aisle width shall not be required to be continuous in aisles serving seating.

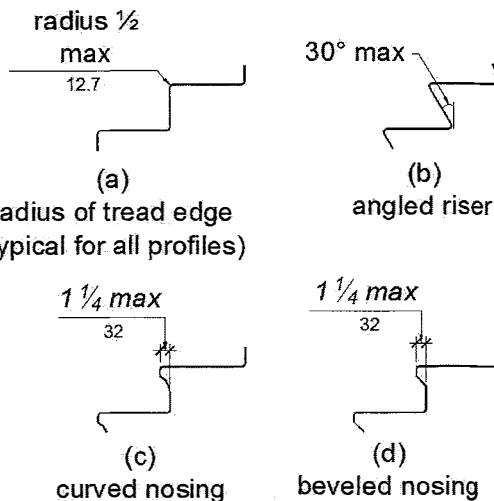


FIGURE 11B-504.5  
STAIR NOSINGS

**11B-505.4 Height.** Top of gripping surfaces of handrails shall be 34 inches (864 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosings, and ramp surfaces.

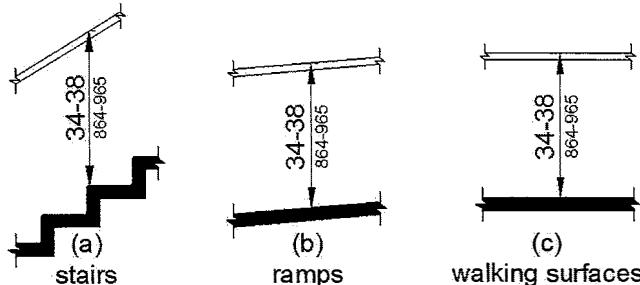


FIGURE 11B-505.4  
HANDRAIL HEIGHT

**11B-505.5 Clearance.** Clearance between handrail gripping surfaces and adjacent surfaces shall be  $1\frac{1}{2}$  inches (38 mm) minimum. *Handrails may be located in a recess if the recess is 3 inches (76 mm) maximum deep and 18 inches (457 mm) minimum clear above the top of the handrail.*

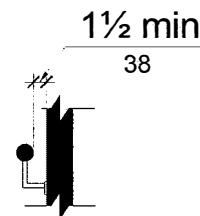


FIGURE 11B-505.5  
HANDRAIL CLEARANCE

**11B-505.6 Gripping surface.** Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. Where provided, horizontal projections shall occur  $1\frac{1}{2}$  inches (38 mm) minimum below the bottom of the handrail gripping surface.

**Exceptions:**

- Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of handrail gripping surfaces shall be permitted to be

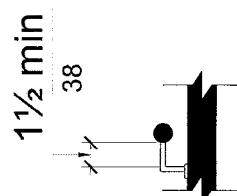


FIGURE 11B-505.6  
HORIZONTAL PROJECTIONS BELOW GRIPPING SURFACE

obstructed along their entire length where they are integral to crash rails or bumper guards.

- The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by  $\frac{1}{8}$  inch (3.2 mm) for each  $\frac{1}{2}$  inch (12.7 mm) of additional handrail perimeter dimension that exceeds 4 inches (102 mm).

**11B-505.7 Cross section.** Handrail gripping surfaces shall have a cross section complying with *Section 11B-505.7.1* or *11B-505.7.2*.

**11B-505.7.1 Circular cross section.** Handrail gripping surfaces with a circular cross section shall have an outside diameter of  $1\frac{1}{4}$  inches (32 mm) minimum and 2 inches (51 mm) maximum.

**11B-505.7.2 Non-circular cross sections.** Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 4 inches (102 mm) minimum and  $6\frac{1}{4}$  inches (159 mm) maximum, and a cross-section dimension of  $2\frac{1}{4}$  inches (57 mm) maximum.

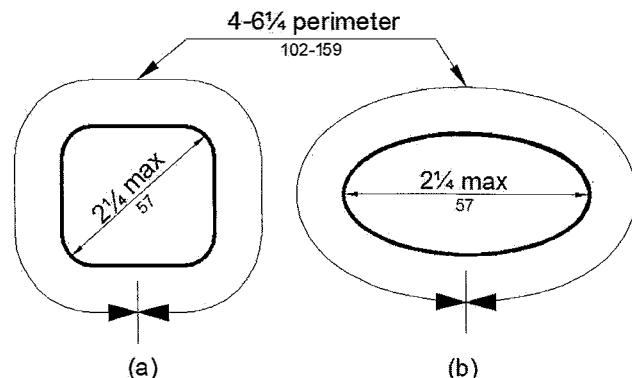


FIGURE 11B-505.7.2  
HANDRAIL NON-CIRCULAR CROSS SECTION

**11B-505.8 Surfaces.** Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

**11B-505.9 Fittings.** Handrails shall not rotate within their fittings.

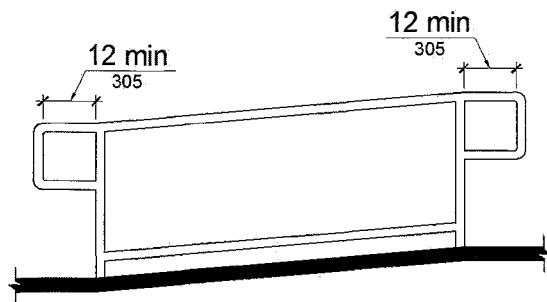
**11B-505.10 Handrail extensions.** Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with *Section 11B-505.10*.

**Exceptions:**

- Extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
- In assembly areas, extensions shall not be required for ramp handrails in aisles serving seating where the handrails are discontinuous to provide access to seating and to permit crossovers within aisles.
- In alterations, where the extension of the handrail in the direction of stair flight or ramp run would create a hazard, the extension of the handrail may be turned 90 degrees from the direction of stair flight or ramp run.

**11B-505.10.1 Top and bottom extension at ramps.**

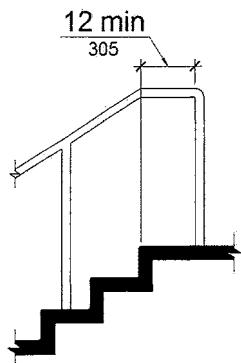
Ramp handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.



**FIGURE 11B-505.10.1  
TOP AND BOTTOM HANDRAIL EXTENSION AT RAMPS**

**11B-505.10.2 Top extension at stairs.**

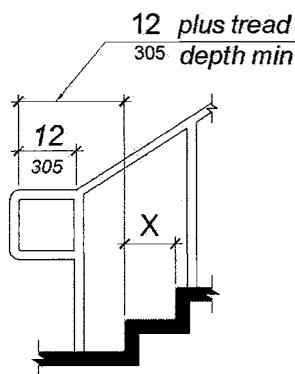
At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.



**FIGURE 11B-505.10.2  
TOP HANDRAIL EXTENSION AT STAIRS**

**11B-505.10.3 Bottom extension at stairs.**

At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance equal to one tread depth beyond the last riser nosing. *The horizontal extension of a handrail shall be 12 inches (305 mm) long minimum and a height equal to that of the sloping portion of the handrail as measured above the stair nosings.* Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.



**FIGURE 11B-505.10.3  
BOTTOM HANDRAIL EXTENSION AT STAIRS**

## DIVISION 6:

# PLUMBING ELEMENTS AND FACILITIES

### **11B-601 General**

**11B-601.1 Scope.** The provisions of *Division 6* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

### **11B-602 Drinking fountains**

**11B-602.1 General.** Drinking fountains shall comply with Sections 11B-307 and 11B-602.

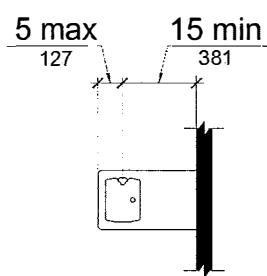
**11B-602.2 Clear floor space.** Units shall have a clear floor or ground space complying with *Section 11B-305* positioned for a forward approach and centered on the unit. Knee and toe clearance complying with *Section 11B-306* shall be provided.

**Exception:** A parallel approach complying with *Section 11B-305* shall be permitted at units for children's use where the spout is 30 inches (762 mm) maximum above the finish floor or ground and is 3½ inches (89 mm) maximum from the front edge of the unit, including bumpers.

**11B-602.3 Operable parts.** Operable parts shall comply with *Section 11B-309*. *The flow of water shall be activated by a manually operated system that is front mounted or side mounted and located within 6 inches (152 mm) of the front edge of the fountain or an automatic electronically controlled device.*

**11B-602.4 Spout height.** Spout outlets shall be 36 inches (914 mm) maximum above the finish floor or ground.

**11B-602.5 Spout location.** The spout shall be located 15 inches (381 mm) minimum from the vertical support and 5 inches (127 mm) maximum from the front edge of the unit, including bumpers.



**FIGURE 11B-602.5**  
**DRINKING FOUNTAIN SPOUT LOCATION**

**11B-602.6 Water flow.** The spout shall provide a flow of water 4 inches (102 mm) high minimum and shall be located 5 inches (127 mm) maximum from the front of the unit. The angle of the water stream shall be measured horizontally relative to the front face of the unit. Where spouts are located less than 3 inches (76 mm) of the front of the unit, the angle of the water stream shall be 30 degrees maximum. Where spouts are located between 3 inches (76 mm) and 5 inches (127 mm) maximum from the front of the unit, the angle of the water stream shall be 15 degrees maximum.

**11B-602.7 Drinking fountains for standing persons.** Spout outlets of drinking fountains for standing persons shall be 38 inches (965 mm) minimum and 43 inches (1092 mm) maximum above the finish floor or ground.

**11B-602.8 Depth.** Wall- and post-mounted cantilevered drinking fountains shall be 18 inches (457 mm) minimum and 19 inches (483 mm) maximum in depth.

**11B-602.9 Pedestrian protection.** All drinking fountains shall either be located completely within alcoves, positioned completely between wing walls, or otherwise positioned so as not to encroach into pedestrian ways. The protected area within which a drinking fountain is located shall be 32 inches (813 mm) wide minimum and 18 inches (457 mm) deep minimum, and shall comply with *Section 11B-305.7*. When used, wing walls or barriers shall project horizontally at least as far as the drinking fountain and to within 6 inches (152 mm) vertically from the floor or ground surface.

### **11B-603 Toilet and bathing rooms**

**11B-603.1 General.** Toilet and bathing rooms shall comply with *Section 11B-603*.

**11B-603.2 Clearances.** Clearances shall comply with *Section 11B-603.2*.

**11B-603.2.1 Turning space.** Turning space complying with *Section 11B-304* shall be provided within the room.

**11B-603.2.2 Overlap.** Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

**11B-603.2.3 Door swing.** Doors shall not swing into the clear floor space or clearance required for any fixture. *Other than the door to the accessible water closet compartment, a door in any position, may encroach into the turning space by 12 inches (305 mm) maximum.*

#### **Exceptions:**

1. **Reserved.**
2. Where the toilet room or bathing room is for individual use and a clear floor space complying with *Section 11B-305.3* is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

**11B-603.3 Mirrors.** Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1016 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (889 mm) maximum above the finish floor or ground.

**11B-603.4 Coat hooks, shelves and medicine cabinets.** Coat hooks shall be located within one of the reach ranges specified in *Section 11B-308*. Shelves shall be located 40 inches (1016 mm) minimum and 48 inches (1219 mm) maximum

above the finish floor. Medicine cabinets shall be located with a usable shelf no higher than 44 inches (1118 mm) maximum above the finish floor.

**11B-603.5 Accessories.** Where towel or sanitary napkin dispensers, waste receptacles, or other accessories are provided in toilet facilities, at least one of each type shall be located on an accessible route. All operable parts, including coin slots, shall be 40 inches (1016 mm) maximum above the finish floor.

**Exception:** Baby changing tables are not required to comply with Section 11B-603.5.

**11B-603.6 Guest room toilet and bathing rooms.** Toilet and bathing rooms within guest rooms that are not required to provide mobility features complying with Section 11B-806.2 shall provide all toilet and bathing fixtures in a location that allows a person using a wheelchair measuring 30 inches by 48 inches (762 mm by 1219 mm) to touch the wheelchair to any lavatory, urinal, water closet, tub, sauna, shower stall and any other similar sanitary installation, if provided.

#### 11B-604 Water closets and toilet compartments

**11B-604.1 General.** Water closets and toilet compartments shall comply with Sections 11B-604.2 through 11B-604.8.

**Exception:** Water closets and toilet compartments for children's use shall be permitted to comply with Section 11B-604.9.

**11B-604.2 Location.** The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 17 inches (432 mm) minimum to 18 inches (457 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in Section 11B-604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

**11B-604.3 Clearance.** Clearances around water closets and in toilet compartments shall comply with Section 11B-604.3.

**11B-604.3.1 Size.** Clearance around a water closet shall be 60 inches (1524 mm) minimum measured perpendicular from the side wall and 56 inches (1422 mm) minimum

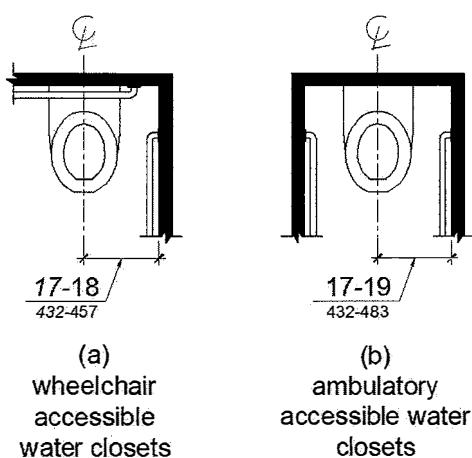


FIGURE 11B-604.2  
WATER CLOSET LOCATION

measured perpendicular from the rear wall. A minimum 60 inches (1524 mm) wide and 48 inches (1219 mm) deep maneuvering space shall be provided in front of the water closet.

**Exception:** In residential dwelling units complying with Section 11B-233.3.1.1, maneuvering space in front of the water closet shall be a minimum 60 inches (1524 mm) wide and 36 inches (914 mm) deep.

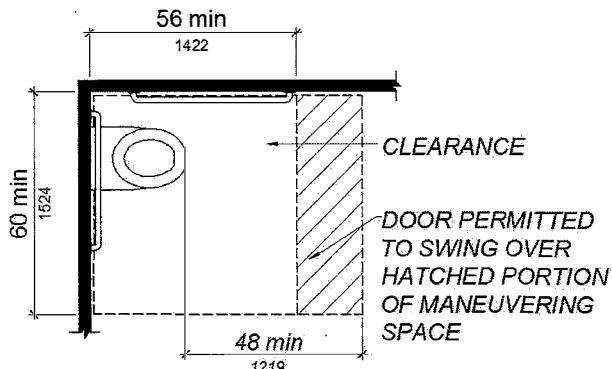


FIGURE 11B-604.3.1  
SIZE OF CLEARANCE AT WATER CLOSETS

**11B-604.3.2 Overlap.** The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

**Exception:** In residential dwelling units, a lavatory complying with Section 11B-606 shall be permitted on the rear wall 18 inches (457 mm) minimum from the water closet centerline where the clearance at the water closet is 66 inches (1676 mm) minimum measured perpendicular from the rear wall.

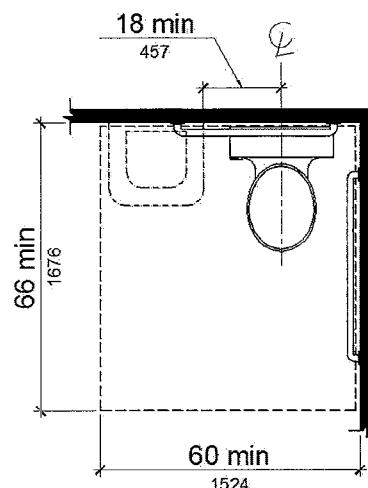


FIGURE 11B-604.3.2 (EXCEPTION)  
OVERLAP OF WATER CLOSET  
CLEARANCE IN RESIDENTIAL DWELLING UNITS

**11B-604.4 Seats.** The seat height of a water closet above the finish floor shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position. Seats shall be 2 inches (51 mm) high maximum.

**Exceptions:**

1. **Reserved.**
2. In residential dwelling units, the height of water closets shall be permitted to be 15 inches (381 mm) minimum and 19 inches (483 mm) maximum above the finish floor measured to the top of the seat.
3. A 3-inch (76 mm) high seat shall be permitted only in alterations where the existing fixture is less than 15 inches (381 mm) high.

**11B-604.5 Grab bars.** Grab bars for water closets shall comply with Section 11B-609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall. Where separate grab bars are required on adjacent walls at a common mounting height, an L-shaped grab bar meeting the dimensional requirements of Sections 11B-604.5.1 and 11B-604.5.2 shall be permitted.

**Exceptions:**

1. **Reserved.**
2. In residential dwelling units, grab bars shall not be required to be installed in toilet or bathrooms provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with Section 11B-604.5.
3. In detention or correction facilities, grab bars shall not be required to be installed in housing or holding cells that are specially designed without protrusions for purposes of suicide prevention.

**11B-604.5.1 Side wall.** The side wall grab bar shall be 42 inches (1067 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1372 mm) minimum from the rear wall with the front end positioned 24 inches (610 mm) minimum in front of the water closet.

**11B-604.5.2 Rear wall.** The rear wall grab bar shall be 36 inches (914 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

**Exceptions:**

1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, where wall space does not permit a length of 36 inches (914 mm) minimum due to the location of a recessed fixture adjacent to the water closet.
2. Where an administrative authority requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.

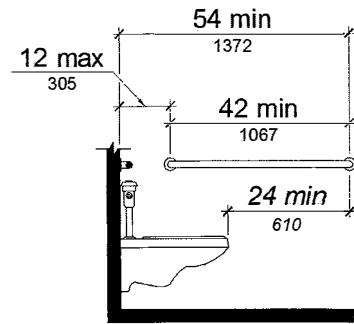


FIGURE 11B-604.5.1  
SIDE WALL GRAB BAR AT WATER CLOSETS

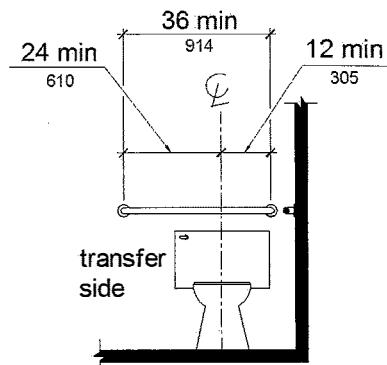


FIGURE 11B-604.5.2  
REAR WALL GRAB BAR AT WATER CLOSETS

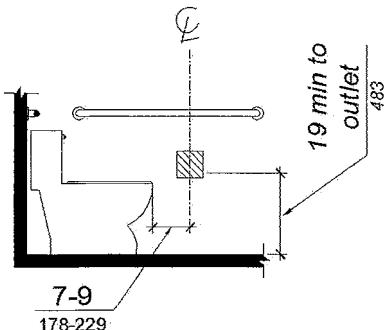
**11B-604.6 Flush controls.** Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with Section 11B-309 except they shall be located 44 inches (1118 mm) maximum above the floor. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with Section 11B-604.8.2.

**11B-604.7 Dispensers.** Toilet paper dispensers shall comply with Section 11B-309.4 and shall be 7 inches (178 mm) minimum and 9 inches (229 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be below the grab bar, 19 inches (483 mm) minimum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

**11B-604.8 Toilet compartments.** Wheelchair accessible toilet compartments shall meet the requirements of Sections 11B-604.8.1 and 11B-604.8.3. Compartments containing more than one plumbing fixture shall comply with Section 11B-603. Ambulatory accessible compartments shall comply with Sections 11B-604.8.2 and 11B-604.8.3.

**11B-604.8.1 Wheelchair accessible compartments.** Wheelchair accessible compartments shall comply with Section 11B-604.8.1.

**11B-604.8.1.1 Size.** Wheelchair accessible compartments shall be 60 inches (1524 mm) wide minimum



**FIGURE 11B-604.7  
DISPENSER OUTLET LOCATION**

measured perpendicular to the side wall, and 56 inches (1422 mm) deep minimum for wall hung water closets and 59 inches (1499 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. *Wheelchair accessible compartments shall additionally provide maneuvering space complying with Section 11B-604.8.1.1.1, 11B-604.8.1.1.2, or 11B-604.8.1.1.3, as applicable.* Wheelchair accessible compartments for children's use shall be 60 inches (1524 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1499 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

**11B-604.8.1.1.1 Maneuvering space with in-swinging door.** In a wheelchair accessible compartment with an in-swinging door, a minimum 60 inches (1524 mm) wide by 36 inches (914 mm) deep maneuvering space shall be provided in front of the clearance required in Section 11B-604.8.1.1. See Figures 11B-604.8.1.1.2 (b) and 11B-604.8.1.1.3 (b).

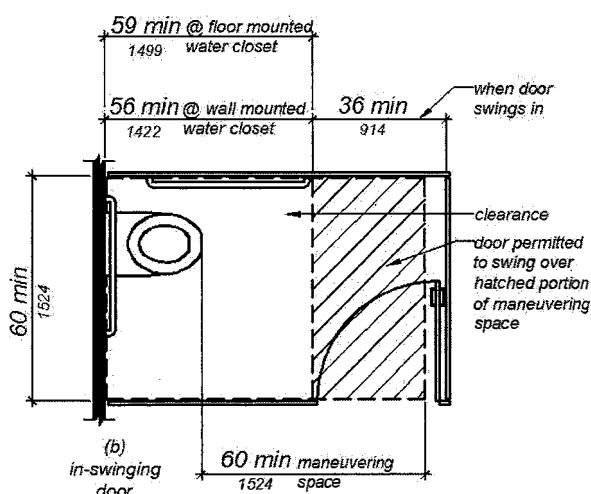
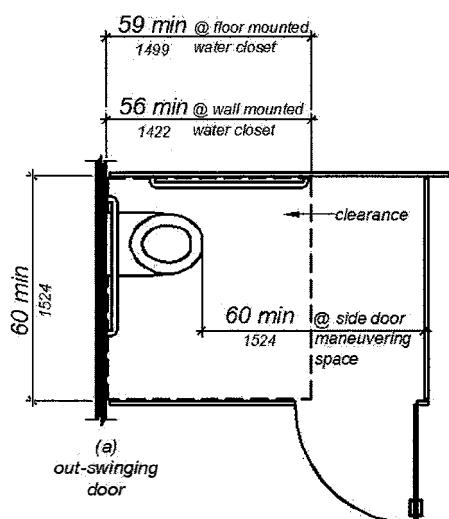
**11B-604.8.1.1.2 Maneuvering space with side-opening door.** In a wheelchair accessible compartment with a door located in the side wall or partition,

either in-swinging or out-swinging, a minimum 60 inches (1524 mm) wide and 60 inches (1524 mm) deep maneuvering space shall be provided in front of the water closet. See Figure 11B-604.8.1.1.2.

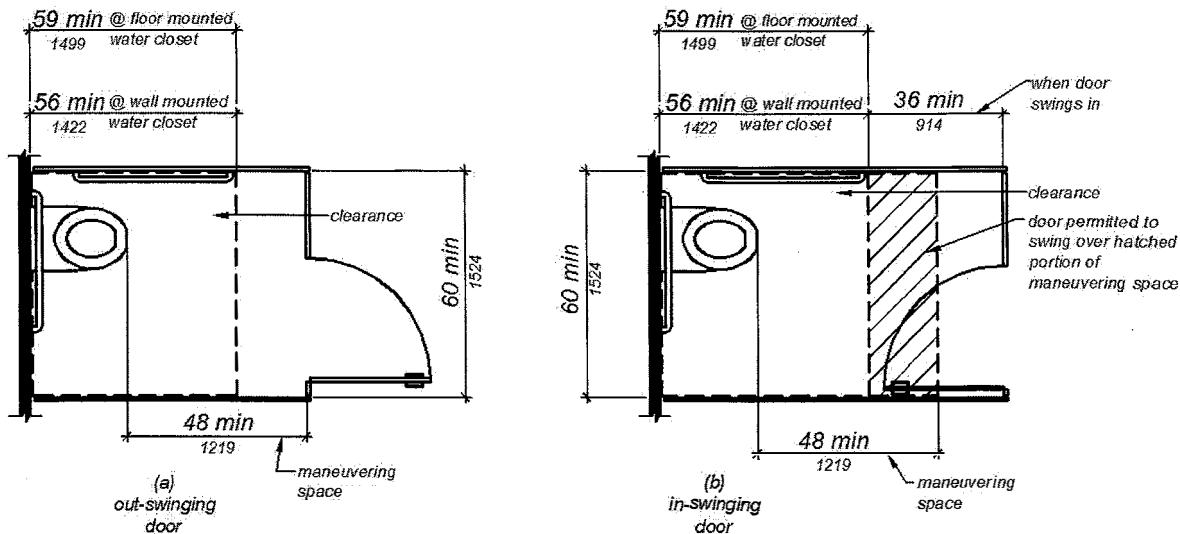
**11B-604.8.1.1.3 Maneuvering space with end-opening door.** In a wheelchair accessible compartment with a door located in the front wall or partition (facing the water closet), either in-swinging or out-swinging, a minimum 60 inches (1524 mm) wide and 48 inches (1219 mm) deep maneuvering space shall be provided in front of the water closet. See Figure 11B-604.8.1.1.3.

**11B-604.8.1.2 Doors.** Toilet compartment doors, including door hardware, shall comply with Section 11B-404 except that if the approach is from the push side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 48 inches (1219 mm) minimum measured perpendicular to the compartment door in its closed position. Doors shall be located in the front partition or in the side wall or partition farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (102 mm) maximum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (102 mm) maximum from the front partition. The door shall be self-closing. A door pull complying with Section 11B-404.2.7 shall be placed on both sides of the door near the latch. *Doors shall not swing into the clear floor space or clearance required for any fixture. Doors may swing into that portion of maneuvering space which does not overlap the clearance required at a water closet.*

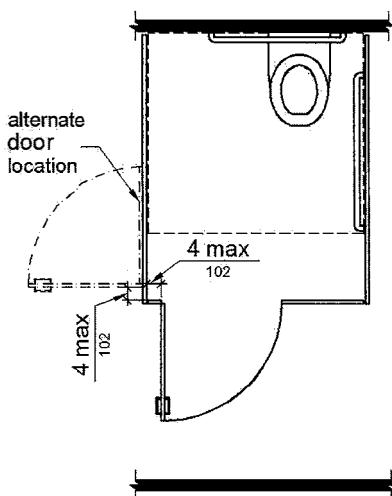
**Exception:** When located at the side of a toilet compartment, the toilet compartment door opening shall provide a clear width of 34 inches (864 mm) minimum.



**FIGURE 11B-604.8.1.1.2  
MANEUVERING SPACE WITH SIDE-OPENING DOOR**



**FIGURE 11B-604.8.1.1.3  
MANEUVERING SPACE WITH END-OPENING DOOR**



**FIGURE 11B-604.8.1.2  
WHEELCHAIR ACCESSIBLE TOILET COMPARTMENT DOORS**

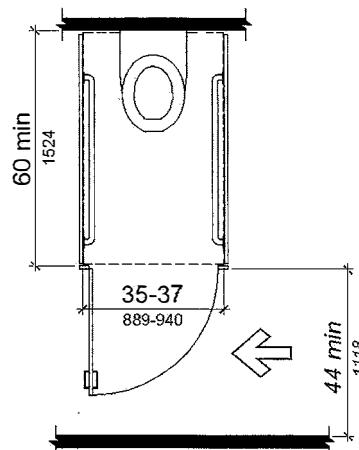
**11B-604.8.1.3 Approach.** Compartments shall be arranged for left-hand or right-hand approach to the water closet.

**11B-604.8.1.4 Toe clearance.** At least one side partition shall provide a toe clearance of 9 inches (229 mm) minimum above the finish floor and 6 inches (152 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. *Partition components at toe clearances shall be smooth without sharp edges or abrasive surfaces.* Compartments for children's use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.

**Exception:** Toe clearance at the side partition is not required in a compartment greater than 66 inches (1676 mm) wide.

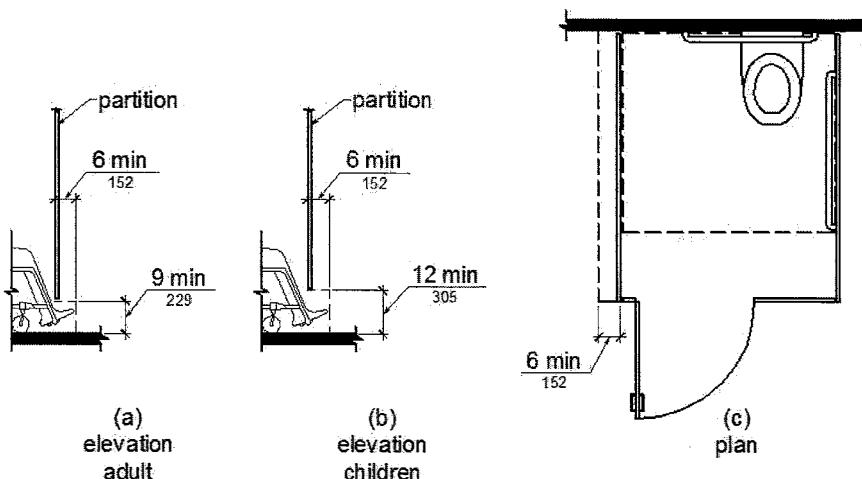
**11B-604.8.1.5 Grab bars.** Grab bars shall comply with Section 11B-609. A side-wall grab bar complying with Section 11B-604.5.1 shall be provided and shall be located on the wall closest to the water closet. In addition, a rear-wall grab bar complying with Section 11B-604.5.2 shall be provided. *Where separate grab bars are required on adjacent walls at a common mounting height, an L-shaped grab bar meeting the dimensional requirements of Sections 11B-604.5.1 and 11B-604.5.2 shall be permitted.*

**11B-604.8.2 Ambulatory accessible compartments.** Ambulatory accessible compartments shall comply with Section 11B-604.8.2.



**11B-604.8.2  
AMBULATORY ACCESSIBLE TOILET COMPARTMENT**

**11B-604.8.2.1 Size.** Ambulatory accessible compartments shall have a depth of 60 inches (1524 mm) minimum and a width of 35 inches (889 mm) minimum and 37 inches (940 mm) maximum.



**FIGURE 11B-604.8.1.4  
WHEELCHAIR ACCESSIBLE TOILET COMPARTMENT TOE CLEARANCE**

**11B-604.8.2.2 Doors.** Toilet compartment doors, including door hardware, shall comply with *Section 11B-404*, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 44 inches (1118 mm) minimum. The door shall be self-closing. A door pull complying with *Section 11B-404.2.7* shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

**11B-604.8.2.3 Grab bars.** Grab bars shall comply with *Section 11B-609*. A side-wall grab bar complying with *Section 11B-604.5.1* shall be provided on both sides of the compartment.

**11B-604.8.3 Coat hooks and shelves.** Coat hooks shall be located within one of the reach ranges specified in *Section 11B-308*. Shelves shall be located 40 inches (1016 mm) minimum and 48 inches (1219 mm) maximum above the finish floor.

**11B-604.9 Water closets and toilet compartments for children's use.** Water closets and toilet compartments for children's use shall comply with *Section 11B-604.9*.

**11B-604.9.1 Location.** The water closet shall be located with a wall or partition to the rear and to one side. The centerline of the water closet shall be 12 inches (305 mm) minimum and 18 inches (457 mm) maximum from the side wall or partition, except that the water closet shall be

17 inches (432 mm) minimum and 19 inches (483 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in *Section 11B-604.8.2*. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

**11B-604.9.2 Clearance.** Clearance around a water closet shall comply with *Section 11B-604.3*.

**11B-604.9.3 Height.** The height of water closets shall be 11 inches (279 mm) minimum and 17 inches (432 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

**11B-604.9.4 Grab bars.** Grab bars for water closets shall comply with *Section 11B-604.5*.

**11B-604.9.5 Flush controls.** Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with *Sections 11B-309.2* and *11B-309.4* and shall be installed 36 inches (914 mm) maximum above the finish floor. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with *Section 11B-604.8.2*.

**11B-604.9.6 Dispensers.** Toilet paper dispensers shall comply with *Section 11B-309.4* and shall be 7 inches (178 mm) minimum and 9 inches (229 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 14 inches (356 mm) minimum and 19 inches (483 mm) maximum above

**TABLE 11B-604.9  
SUGGESTED DIMENSIONS FOR CHILDREN'S USE**

<b>SUGGESTED DIMENSIONS FOR WATER CLOSETS SERVING CHILDREN AGES 3 THROUGH 12</b>			
	<b>Ages 3 and 4</b>	<b>Ages 5 through 8</b>	<b>Ages 9 through 12</b>
<b>Water Closet Centerline</b>	12 inches (305 mm)	12 to 15 inches (305 to 381 mm)	15 to 18 inches (381 to 457 mm)
<b>Toilet Seat Height</b>	11 to 12 inches (279 to 305 mm)	12 to 15 inches (305 to 381 mm)	15 to 17 inches (381 to 432 mm)
<b>Grab Bar Height</b>	18 to 20 inches (457 to 508 mm)	20 to 25 inches (508 to 635 mm)	25 to 27 inches (635 to 686 mm)
<b>Dispenser Height</b>	14 inches (356 mm)	14 to 17 inches (356 to 432 mm)	17 to 19 inches (432 to 483 mm)

the finish floor. There shall be a clearance of  $1\frac{1}{2}$  inches (38 mm) minimum below the grab bar. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

**11B-604.9.7 Toilet compartments.** Toilet compartments shall comply with *Section 11B-604.8*.

### 11B-605 Urinals

**11B-605.1 General.** Urinals shall comply with *Section 11B-605*.

**11B-605.2 Height and depth.** Urinals shall be the stall-type or the wall-hung type with the rim 17 inches (432 mm) maximum above the finish floor or ground. Urinals shall be  $13\frac{1}{2}$  inches (343 mm) deep minimum measured from the outer face of the urinal rim to the back of the fixture.

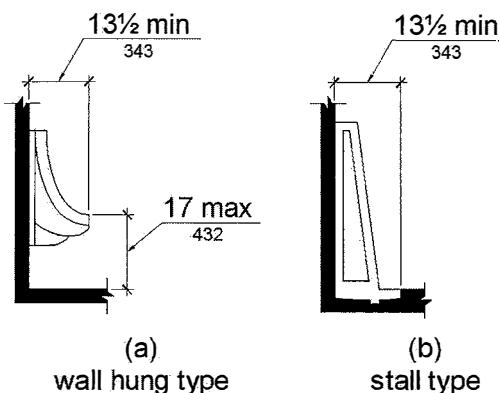


FIGURE 11B-605.2  
HEIGHT AND DEPTH OF URINALS

**11B-605.3 Clear floor space.** A clear floor or ground space complying with *Section 11B-305* positioned for forward approach shall be provided.

**11B-605.4 Flush controls.** Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with *Section 11B-309* except that the flush control shall be mounted at a maximum height of 44 inches (1118 mm) above the finish floor.

### 11B-606 Lavatories and sinks

**11B-606.1 General.** Lavatories and sinks shall comply with *Section 11B-606*.

**11B-606.2 Clear floor space.** A clear floor space complying with *Section 11B-305*, positioned for a forward approach, and knee and toe clearance complying with *Section 11B-306* shall be provided.

#### Exceptions:

1. A parallel approach complying with *Section 11B-305* shall be permitted to a kitchen sink in a space where a cook top or conventional range is not provided and to wet bars.
2. **Reserved.**

3. In residential dwelling units, cabinetry shall be permitted under lavatories and kitchen sinks provided that all of the following conditions are met:

- (a) the cabinetry can be removed without removal or replacement of the fixture;
- (b) the finish floor extends under the cabinetry; and
- (c) the walls behind and surrounding the cabinetry are finished.
4. A knee clearance of 24 inches (610 mm) minimum above the finish floor or ground shall be permitted at lavatories and sinks used primarily by children 6 through 12 years where the rim or counter surface is 31 inches (787 mm) maximum above the finish floor or ground.
5. A parallel approach complying with *Section 11B-305* shall be permitted to lavatories and sinks used primarily by children 5 years and younger.
6. The dip of the overflow shall not be considered in determining knee and toe clearances.
7. No more than one bowl of a multi-bowl sink shall be required to provide knee and toe clearance complying with *Section 11B-306*.

**11B-606.3 Height.** Lavatories and sinks shall be installed with the front of the higher of the rim or counter surface 34 inches (864 mm) maximum above the finish floor or ground.

#### Exceptions:

1. **Reserved.**
2. In residential dwelling unit kitchens, sinks that are adjustable to variable heights, 29 inches (737 mm) minimum and 36 inches (914 mm) maximum, shall be permitted where rough-in plumbing permits connections of supply and drain pipes for sinks mounted at the height of 29 inches (737 mm).

**11B-606.4 Faucets.** Controls for faucets shall comply with *Section 11B-309*. Hand-operated metering faucets shall remain open for 10 seconds minimum.

**11B-606.5 Exposed pipes and surfaces.** Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.

**11B-606.6 Adjacent side wall or partition.** Lavatories, when located adjacent to a side wall or partition, shall be a minimum of 18 inches (457 mm) to the centerline of the fixture.

**11B-606.7 Sink depth.** Where a forward approach is required at a sink, knee and toe clearance shall be provided in compliance with *Section 11B-306*.

### 11B-607 Bathtubs

**11B-607.1 General.** Bathtubs shall comply with *Section 11B-607*.

**11B-607.2 Clearance.** Clearance in front of bathtubs shall extend the length of the bathtub and shall be 48 inches (1219 mm) wide minimum for forward approach and 30 inches (762

mm) wide minimum for parallel approach. A lavatory complying with *Section 11B-606* shall be permitted at the control end of the clearance. Where a permanent seat is provided at the head end of the bathtub, the clearance shall extend 12 inches (305 mm) minimum beyond the wall at the head end of the bathtub.

**11B-607.3 Seat.** A permanent seat at the head end of the bathtub or a removable in-tub seat shall be provided. Seats shall comply with *Section 11B-610*.

**11B-607.4 Grab bars.** Grab bars for bathtubs shall comply with *Section 11B-609* and shall be provided in accordance with *Section 11B-607.4.1* or *11B-607.4.2*. Where separate grab bars are required on adjacent walls at a common mounting height, an L-shaped or U-shaped grab bar meeting

the dimensional requirements of *Section 11B-607.4.1* or *11B-607.4.2* shall be permitted.

#### Exceptions:

1. Reserved.
2. In residential dwelling units, grab bars shall not be required to be installed in bathtubs located in bathing facilities provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with *Section 11B-607.4*.

**11B-607.4.1 Bathtubs with permanent seats.** For bathtubs with permanent seats, grab bars shall be provided in accordance with *Section 11B-607.4.1*.

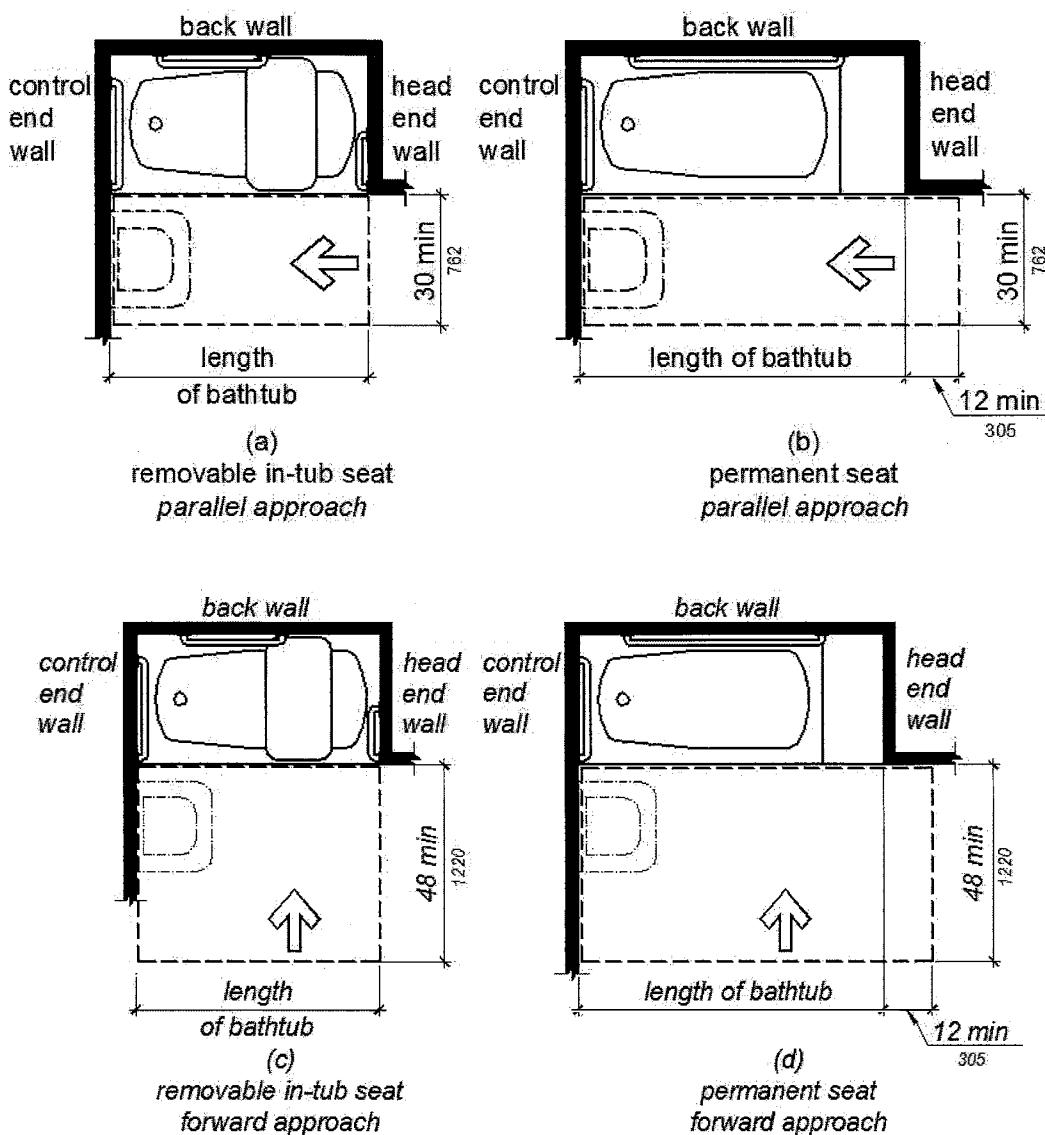


FIGURE 11B-607.2  
CLEARANCE FOR BATHTUBS

**11B-607.4.1.1 Back wall.** Two grab bars shall be installed on the back wall, one located in accordance with *Section 11B-609.4* and the other located 8 inches (203 mm) minimum and 10 inches (254 mm) maximum above the rim of the bathtub. Each grab bar shall be installed 15 inches (381 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

**11B-607.4.1.2 Control end wall.** A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

**11B-607.4.2 Bathtubs without permanent seats.** For bathtubs without permanent seats, grab bars shall comply with *Section 11B-607.4.2*.

**11B-607.4.2.1 Back wall.** Two grab bars shall be installed on the back wall, one located in accordance with *Section 11B-609.4* and the other located 8 inches (203 mm) minimum and 10 inches (254 mm) maximum above the rim of the bathtub. Each grab bar shall be 24 inches (610 mm) long minimum and shall be installed 24 inches (610 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

**11B-607.4.2.2 Control end wall.** A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

**11B-607.4.2.3 Head end wall.** A grab bar 12 inches (305 mm) long minimum shall be installed on the head end wall at the front edge of the bathtub.

**11B-607.5 Controls.** Controls, other than drain stoppers, shall be located on an end wall. Controls shall be between the bathtub rim and grab bar, and between the open side of the bathtub and the centerline of the width of the bathtub. Controls shall comply with *Section 11B-309.4*.

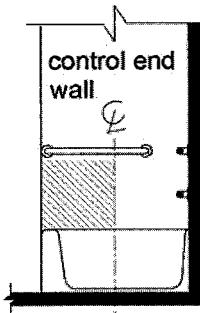
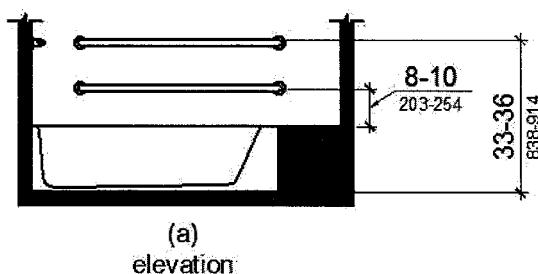
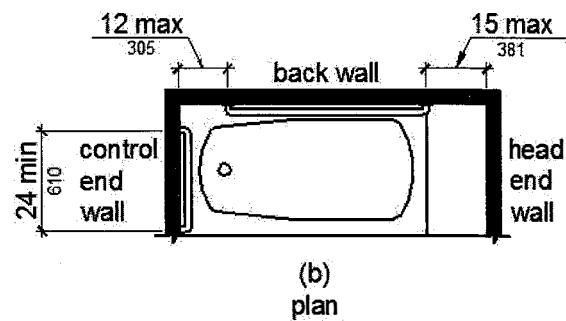


FIGURE 11B-607.5  
BATHTUB CONTROL LOCATION

**11B-607.6 Shower spray unit and water.** A shower spray unit with a hose 59 inches (1499 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Bathtub shower spray units shall deliver water that is 120°F (49°C) maximum.

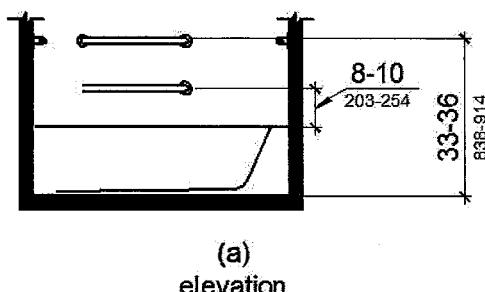


(a)  
elevation

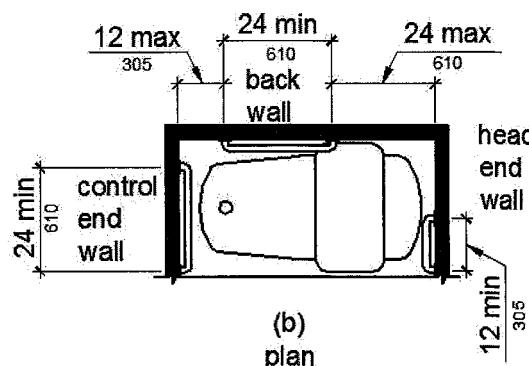


(b)  
plan

FIGURE 11B-607.4.1  
GRAB BARS FOR BATHTUBS WITH PERMANENT SEATS



(a)  
elevation



(b)  
plan

FIGURE 11B-607.4.2  
GRAB BARS FOR BATHTUBS WITH REMOVABLE IN-TUB SEATS

**11B-607.7 Bathtub enclosures.** Enclosures for bathtubs shall not obstruct controls, faucets, shower and spray units or obstruct transfer from wheelchairs onto bathtub seats or into bathtubs. Enclosures on bathtubs shall not have tracks installed on the rim of the open face of the bathtub.

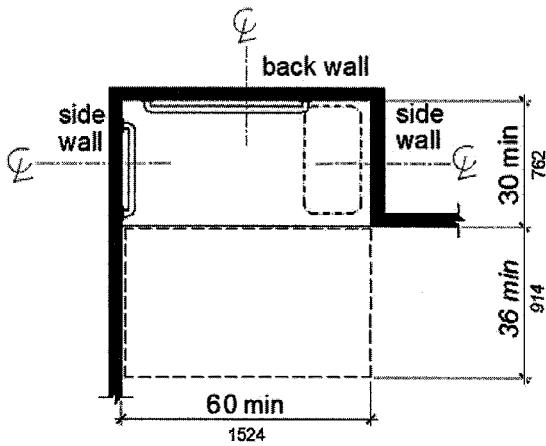
### 11B-608 Shower compartments

**11B-608.1 General.** Shower compartments shall comply with Section 11B-608.

**11B-608.2 Size and clearances for shower compartments.** Shower compartments shall have sizes and clearances complying with Section 11B-608.2.

#### 11B-608.2.1 Reserved.

**11B-608.2.2 Standard roll-in type shower compartments.** Standard roll-in type shower compartments shall be 30 inches (762 mm) wide minimum by 60 inches (1524 mm) deep minimum clear inside dimensions measured at center points of opposing sides with a full opening width on the long side.



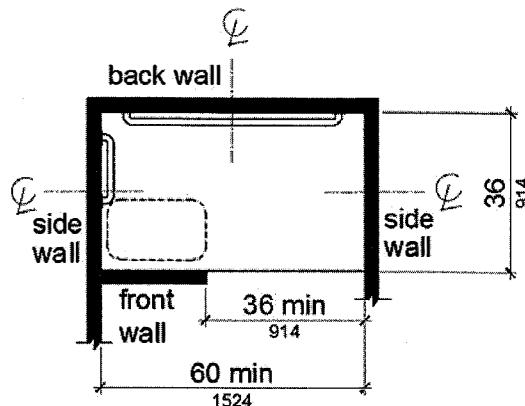
**FIGURE 11B-608.2.2  
STANDARD ROLL-IN TYPE  
SHOWER COMPARTMENT SIZE AND CLEARANCE**

**11B-608.2.2.1 Clearance.** A 36 inch (914 mm) wide minimum by 60 inch (1524 mm) long minimum clearance shall be provided adjacent to the open face of the shower compartment.

**Exception: Reserved.**

**11B-608.2.3 Alternate roll-in type shower compartments.** Alternate roll-in type shower compartments shall be 36 inches (914 mm) wide and 60 inches (1524 mm) deep minimum clear inside dimensions measured at center points of opposing sides. A 36 inch (914 mm) wide minimum entry shall be provided at one end of the long side of the compartment.

**11B-608.3 Grab bars.** Grab bars shall comply with Section 11B-609 and shall be provided in accordance with Section 11B-608.3. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the finish floor. Where separate grab bars are required on



Note: inside finished dimensions measured at the center points of opposing sides

**FIGURE 11B-608.2.3  
ALTERNATE ROLL-IN TYPE  
SHOWER COMPARTMENT SIZE AND CLEARANCE**

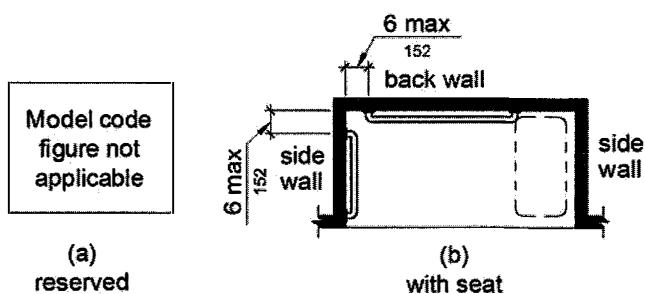
adjacent walls at a common mounting height, an L-shaped or U-shaped grab bar meeting the dimensional requirements of Section 11B-608.3.2 or 11B-608.3.3 shall be permitted.

#### Exceptions:

1. **Reserved.**
2. In residential dwelling units, grab bars shall not be required to be installed in showers located in bathing facilities provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with Section 11B-608.3.

#### 11B-608.3.1 Reserved.

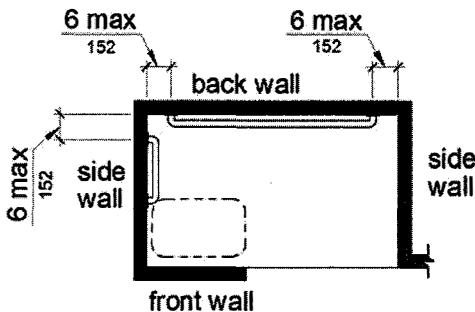
**11B-608.3.2 Standard roll-in type shower compartments.** Grab bars shall be provided on the back wall and the side wall opposite the seat. Grab bars shall not be provided above the seat. Grab bars shall be installed 6 inches (152 mm) maximum from adjacent walls.



**FIGURE 11B-608.3.2  
GRAB BARS FOR STANDARD ROLL-IN TYPE SHOWER**

**11B-608.3.3 Alternate roll-in type shower compartments.** In alternate roll-in type shower compartments, grab bars shall be provided on the back wall and the side wall farthest from the compartment entry. Grab bars shall

not be provided above the seat. Grab bars shall be installed 6 inches (152 mm) maximum from adjacent walls.



**FIGURE 11B-608.3.3  
GRAB BARS FOR ALTERNATE ROLL-IN TYPE SHOWERS**

**11B-608.4 Seats.** A folding seat shall be provided in roll-in type showers. Seats shall comply with *Section 11B-610*.

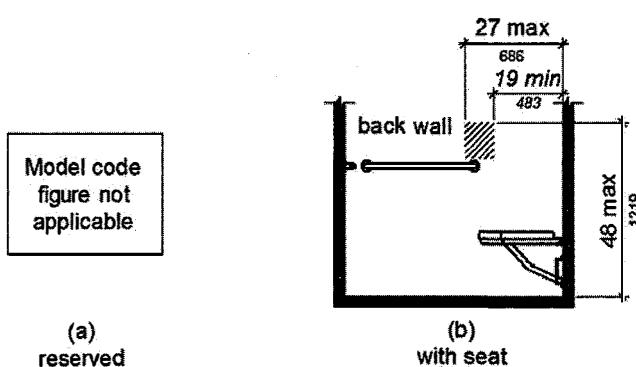
**Exception:** In residential dwelling units, seats shall not be required in shower compartments provided that reinforcement has been installed in walls so as to permit the installation of seats complying with *Section 11B-608.4*.

**11B-608.5 Controls.** Controls, faucets, and shower spray units shall comply with *Section 11B-309.4*. *Controls and faucets shall be of a single-lever design.*

#### 11B-608.5.1 Reserved.

**11B-608.5.2 Standard roll-in type shower compartments.** In standard roll-in type shower compartments, operable parts of controls and faucets shall be installed on the back wall of the compartment adjacent to the seat wall 19 inches (483 mm) minimum and 27 inches (686 mm) maximum from the seat wall; and shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor, with their centerline at 39 inches (991 mm) to 41 inches (1041 mm) above the shower floor.

*Operable parts of the shower spray unit, including the handle, shall be installed on the back wall adjacent to the seat wall 19 inches (483 mm) minimum and 27 inches (686*



**FIGURE 11B-608.5.2  
STANDARD ROLL-IN TYPE  
SHOWER COMPARTMENT CONTROL LOCATION**

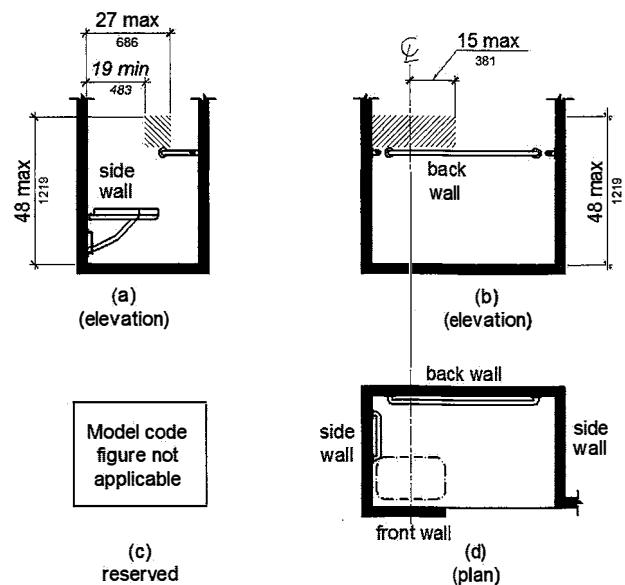
mm) maximum from the seat wall; and shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor.

**11B-608.5.3 Alternate roll-in type shower compartments.** In alternate roll-in type shower compartments, operable parts of controls and faucets shall be installed on the side wall of the compartment adjacent to the seat wall 19 inches (483 mm) minimum and 27 inches (686 mm) maximum from the seat wall; and shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor, with their centerline at 39 inches (991 mm) to 41 inches (1041 mm) above the shower floor.

*Operable parts of the shower spray unit, including the handle, shall be installed on the side wall of the compartment adjacent to the seat wall 17 inches (432 mm) minimum and 19 inches (483 mm) maximum from the seat wall or on the back wall opposite the seat 15 inches (381 mm) maximum, left or right, of the centerline of the seat; and shall be located above the grab bar, but no higher than 48 inches (1219 mm) above the shower floor.*

**11B-608.6 Shower spray unit and water.** A shower spray unit with a hose 59 inches (1499 mm) long minimum that can be used both as a fixed-position shower head and as a handheld shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

**Exception:** Where subject to excessive vandalism, two fixed shower heads shall be installed instead of a handheld spray unit in facilities that are not transient lodging guest rooms. Each shower head shall be installed so it can be operated independently of the other and shall have swivel angle adjustments, both vertically and horizontally.



**FIGURE 11B-608.5.3  
ALTERNATE ROLL-IN TYPE  
SHOWER COMPARTMENT CONTROL LOCATION**

**11B-608.7 Thresholds.** Thresholds in roll-in type shower compartments shall be  $\frac{1}{2}$  inch (12.7 mm) high maximum in accordance with Section 11B-303.

**Exception: Reserved.**

**11B-608.8 Shower enclosures.** Enclosures for shower compartments shall not obstruct controls, faucets, and shower spray units or obstruct transfer from wheelchairs onto shower seats.

**11B-608.9 Shower floor or ground surface.** Floor or ground surfaces of showers shall comply with Section 11B-302.1 and shall be sloped 1:48 maximum in any direction. Where drains are provided, grate openings shall be  $\frac{1}{4}$  inch (6.4 mm) maximum and flush with the floor surface.

**11B-608.10 Soap dish.** Where a soap dish is provided, it shall be located on the control wall at 40 inches (1016 mm) maximum above the shower floor, and within the reach limits from the seat.

#### 11B-609 Grab bars

**11B-609.1 General.** Grab bars in toilet facilities and bathing facilities shall comply with Section 11B-609.

**11B-609.2 Cross section.** Grab bars shall have a cross section complying with Section 11B-609.2.1 or 11B-609.2.2.

**11B-609.2.1 Circular cross section.** Grab bars with circular cross sections shall have an outside diameter of  $1\frac{1}{4}$  inches (32 mm) minimum and 2 inches (51 mm) maximum.

**11B-609.2.2 Non-circular cross section.** Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter dimension of 4 inches (102 mm) minimum and 4.8 inches (122 mm) maximum.

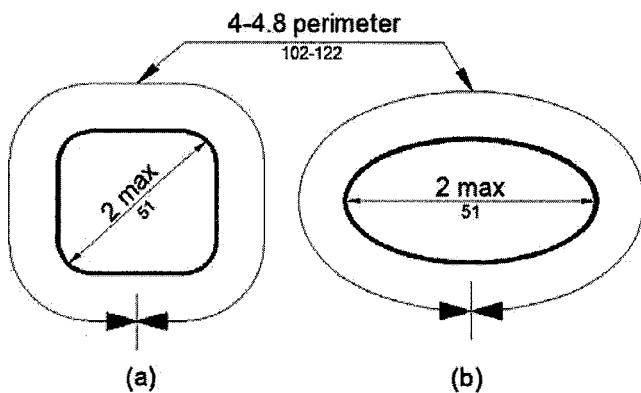


FIGURE 11B-609.2.2  
GRAB BAR NON-CIRCULAR CROSS SECTION

**11B-609.3 Spacing.** The space between the wall and the grab bar shall be  $1\frac{1}{2}$  inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be  $1\frac{1}{2}$  inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.

#### Exceptions:

- The space between the grab bars and shower controls, shower fittings, and other grab bars above shall be permitted to be  $1\frac{1}{2}$  inches (38 mm) minimum.
- For L-shaped or U-shaped grab bars complying with Section 11B-609.9 the space between the walls and the grab bar shall be  $1\frac{1}{2}$  inches (38 mm) minimum for a distance of 6 inches on either side of the inside corner between two adjacent wall surfaces.

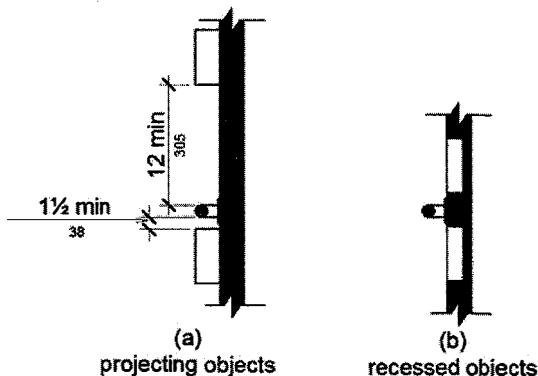


FIGURE 11B-609.3  
SPACING OF GRAB BARS

**11B-609.4 Position of grab bars.** Grab bars shall be installed in a horizontal position, 33 inches (838 mm) minimum and 36 inches (914 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with Section 11B-604.9, grab bars shall be installed in a horizontal position 18 inches (457 mm) minimum and 27 inches (686 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with Section 11B-607.4.1.1 or 11B-607.4.2.1.

**11B-609.5 Surface hazards.** Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

**11B-609.6 Fittings.** Grab bars shall not rotate within their fittings.

**11B-609.7 Installation.** Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

**11B-609.8 Structural strength.** Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

**11B-609.9 Alternate configuration.** L-shaped or U-shaped grab bars shall be permitted.

#### 11B-610 Seats

**11B-610.1 General.** Seats in bathtubs and shower compartments shall comply with Section 11B-610.

**11B-610.2 Bathtub seats.** The top of bathtub seats shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maxi-

mum above the bathroom finish floor. The depth of a removable in-tub seat shall be 15 inches (381 mm) minimum and 16 inches (406 mm) maximum. The seat shall be capable of secure placement. Permanent seats at the head end of the bathtub shall be 15 inches (381 mm) deep minimum and shall extend from the back wall to or beyond the outer edge of the bathtub.

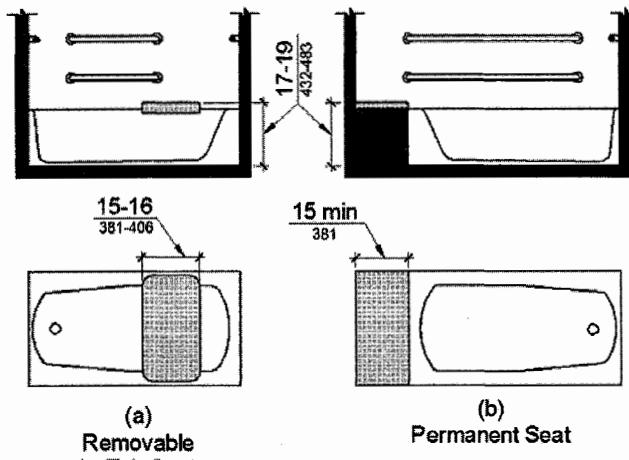


FIGURE 11B-610.2  
BATHTUB SEATS

**11B-610.3 Shower compartment seats.** A seat in a standard roll-in shower compartment shall be a folding type, shall be installed on the side wall adjacent to the controls, and shall extend from the back wall to a point within 3 inches (76 mm) of the compartment entry. A seat in an alternate roll-in type shower compartment shall be a folding type, shall be installed on the front wall opposite the back wall, and shall extend from the adjacent side wall to a point within 3 inches (76 mm) of the compartment entry. The top of the seat shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum above the bathroom finish floor. When folded, the seat shall extend 6 inches (152 mm) maximum from the mounting wall. Seats shall comply with Section 11B-610.3.1 or 11B-610.3.2.

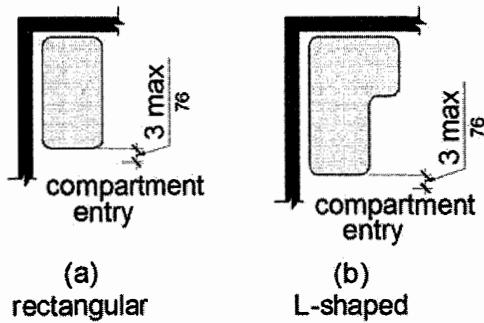


FIGURE 11B-610.3  
EXTENT OF SEAT

**11B-610.3.1 Rectangular seats.** The rear edge of a rectangular seat shall be  $2\frac{1}{2}$  inches (64 mm) maximum and the front edge 15 inches (381 mm) minimum and 16 inches (406 mm) maximum from the seat wall. The side

edge of the seat shall be  $1\frac{1}{2}$  inches (38 mm) maximum from the adjacent wall.

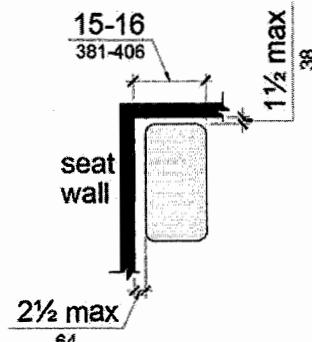


FIGURE 11B-610.3.1  
RECTANGULAR SHOWER SEAT

**11B-610.3.2 L-shaped seats.** The rear edge of an L-shaped seat shall be  $2\frac{1}{2}$  inches (64 mm) maximum and the front edge 15 inches (381 mm) minimum and 16 inches (406 mm) maximum from the seat wall. The rear edge of the "L" portion of the seat shall be  $1\frac{1}{2}$  inches (38 mm) maximum from the wall and the front edge shall be 14 inches (356 mm) minimum and 15 inches (381 mm) maximum from the wall. The end of the "L" shall be 22 inches (559 mm) minimum and 23 inches (584 mm) maximum from the main seat wall.

**11B-610.4 Structural strength.** Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

#### 11B-611 Washing machines and clothes dryers

**11B-611.1 General.** Washing machines and clothes dryers shall comply with Section 11B-611.

**11B-611.2 Clear floor space.** A clear floor or ground space complying with Section 11B-305 positioned for parallel approach shall be provided. The clear floor or ground space shall be centered on the appliance.

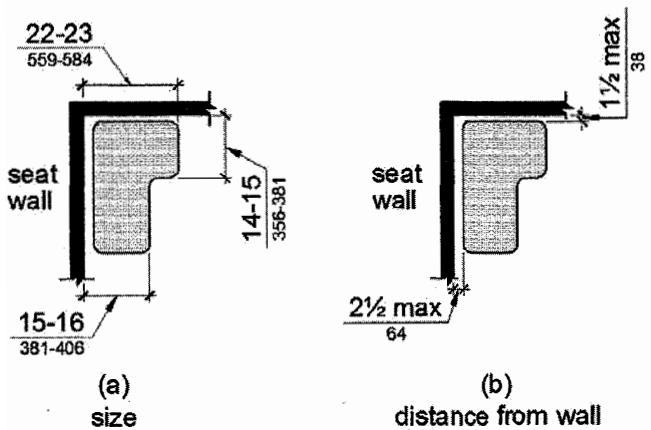
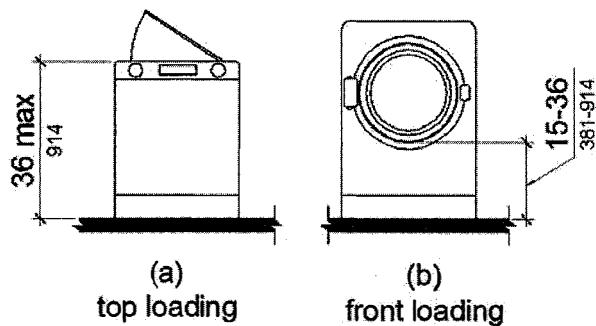


FIGURE 11B-610.3.2  
L-SHAPED SHOWER SEAT

**11B-611.3 Operable parts.** Operable parts, including doors, lint screens, and detergent and bleach compartments shall comply with *Section 11B-309*.

**11B-611.4 Height.** Top loading machines shall have the door to the laundry compartment located 36 inches (914 mm) maximum above the finish floor. Front loading machines shall have the bottom of the opening to the laundry compartment located 15 inches (381 mm) minimum and 36 inches (914 mm) maximum above the finish floor.



**FIGURE 11B-611.4  
HEIGHT OF LAUNDRY COMPARTMENT OPENING**

**11B-612 Saunas and steam rooms**

**11B-612.1 General.** Saunas and steam rooms shall comply with *Section 11B-612*.

**11B-612.2 Bench.** Where seating is provided in saunas and steam rooms, at least one bench shall comply with *Section 11B-903*. Doors shall not swing into the clear floor space required by *Section 11B-903.2*.

**Exception:** A readily removable bench shall be permitted to obstruct the turning space required by *Section 11B-612.3* and the clear floor or ground space required by *Section 11B-903.2*.

**11B-612.3 Turning space.** A turning space complying with *Section 11B-304* shall be provided within saunas and steam rooms.

## DIVISION 7:

# COMMUNICATION ELEMENTS AND FEATURES

### **11B-701 General**

**11B-701.1 Scope.** The provisions of *Division 7* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

### **11B-702 Fire alarm systems**

**11B-702.1 General.** Fire alarm systems shall have permanently installed audible and visible alarms complying with NFPA 72 and Chapter 9, Sections 907.5.2.1 and 907.5.2.3.

**Exception: Reserved.**

### **11B-703 Signs**

**11B-703.1 General.** Signs shall comply with *Section 11B-703*. Where both visual and tactile characters are required, either one sign with both visual and tactile characters, or two separate signs, one with visual, and one with tactile characters, shall be provided.

**11B-703.1.1 Plan review and inspection.** Signs as specified in *Section 11B-703*, or in other sections of this code, when included in the construction of new buildings or facilities, or when included, altered or replaced due to additions, alterations or renovations to existing buildings or facilities, and when a permit is required, shall comply with Sections 11B-703.1.1 and 11B-703.1.2.

**11B-703.1.1.1 Plan review.** Plans, specifications or other information indicating compliance with these regulations shall be submitted to the enforcing agency for review and approval.

**11B-703.1.1.2 Inspection.** Signs and identification devices shall be field inspected after installation and approved by the enforcing agency prior to the issuance of a final certificate of occupancy per Chapter 1, Division II, Section 111, or final approval where no certificate of occupancy is issued. The inspection shall include, but not be limited to, verification that Braille dots and cells are properly spaced and the size, proportion and type of raised characters are in compliance with these regulations.

**11B-703.2 Raised characters.** Raised characters shall comply with *Section 11B-703.2* and shall be duplicated in Braille complying with *Section 11B-703.3*. Raised characters shall be installed in accordance with *Section 11B-703.4*.

**11B-703.2.1 Depth.** Raised characters shall be  $\frac{1}{32}$  inch (0.8 mm) minimum above their background.

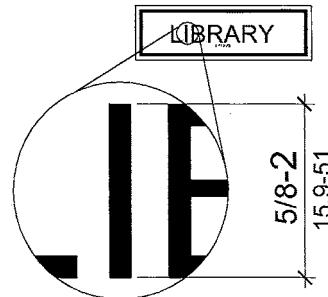
**11B-703.2.2 Case.** Characters shall be uppercase.

**11B-703.2.3 Style.** Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

**11B-703.2.4 Character proportions.** Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

**11B-703.2.5 Character height.** Character height measured vertically from the baseline of the character shall be  $\frac{5}{8}$  inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I".

**Exception: Reserved.**



**FIGURE 11B-703.2.5  
HEIGHT OF RAISED CHARACTERS**

**11B-703.2.6 Stroke thickness.** Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.

**11B-703.2.7 Character spacing.** Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Where characters have rectangular cross sections, spacing between individual raised characters shall be  $\frac{1}{8}$  inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. Where characters have other cross sections, spacing between individual raised characters shall be  $\frac{1}{16}$  inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections, and  $\frac{1}{8}$  inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements  $\frac{3}{8}$  inch (9.5 mm) minimum.

**11B-703.2.8 Line spacing.** Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

**11B-703.2.9 Format.** Text shall be in a horizontal format.

**11B-703.3 Braille.** Braille shall be contracted (Grade 2) and shall comply with *Sections 11B-703.3* and *11B-703.4*.

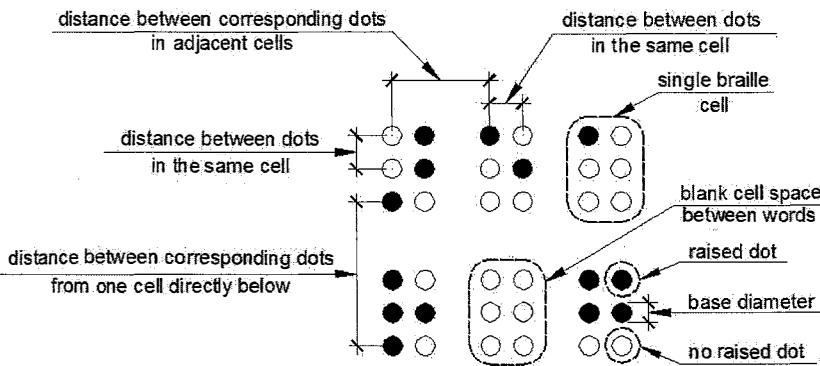
**11B-703.3.1 Dimensions and capitalization.** Braille dots shall have a domed or rounded shape and shall comply with *Table 11B-703.3.1*. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

**11B-703.3.2 Position.** Braille shall be positioned below the corresponding text in a horizontal format, flush left or centered. If text is multi-lined, Braille shall be placed below the entire text. Braille shall be separated  $\frac{3}{8}$  inch

**TABLE 11B-703.3.1**  
**BRAILLE DIMENSIONS**

MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell <sup>1</sup>	0.100 (2.5 mm)
Distance between corresponding dots in adjacent cells <sup>1</sup>	0.300 (7.6 mm)
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between corresponding dots from one cell directly below <sup>1</sup>	0.395 (10 mm) to 0.400 (10.2 mm)

1. Measured center to center.



**FIGURE 11B-703.3.1**  
**BRAILLE MEASUREMENT**

(9.5 mm) minimum and  $\frac{1}{2}$  inch (12.7 mm) maximum from any other tactile characters and 3/8 inch (9.5 mm) minimum from raised borders and decorative elements.

> **Exception:** Braille provided on elevator car controls shall be separated  $\frac{3}{16}$  inch (4.8 mm) minimum and shall be located directly below the corresponding raised characters or symbols.

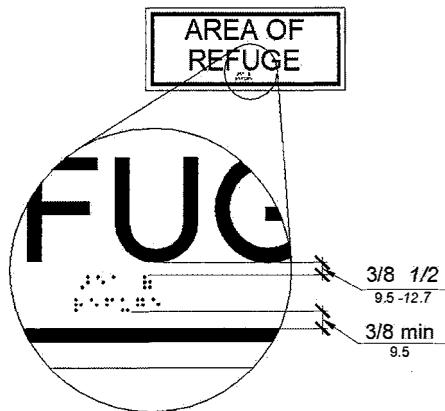
**11B-703.4 Installation height and location.** Signs with tactile characters shall comply with Section 11B-703.4.

**11B-703.4.1 Height above finish floor or ground.** Tactile characters on signs shall be located 48 inches (1219 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest *Braille cells* and 60 inches (1524 mm) maximum above the finish floor or

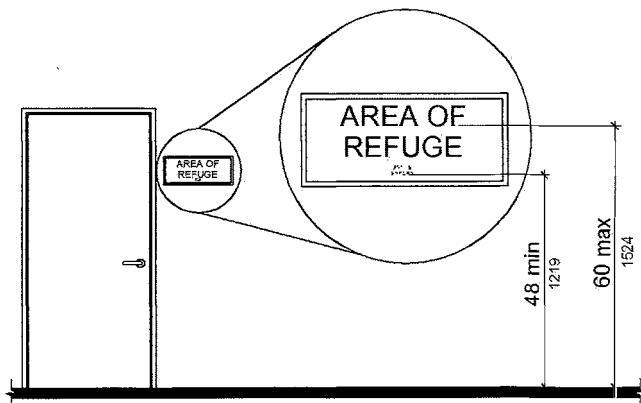
ground surface, measured from the baseline of the highest line of raised characters.

**Exception:** Tactile characters for elevator car controls shall not be required to comply with Section 11B-703.4.1.

**11B-703.4.2 Location.** Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile char-



**FIGURE 11B-703.3.2**  
**POSITION OF BRAILLE**



**FIGURE 11B-703.4.1**  
**HEIGHT OF TACTILE CHARACTERS**  
**ABOVE FINISH FLOOR OR GROUND**

acters shall be located so that a clear floor space of 18 inches (457 mm) minimum by 18 inches (457 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. *Where provided, signs identifying permanent rooms and spaces shall be located at the entrance to, and outside of the room or space. Where provided, signs identifying exits shall be located at the exit door when approached in the direction of egress travel.*

**Exception:** In alterations where sign installation locations identified in Section 11B-703.4.2 are obstructed or otherwise unavailable for sign installation, signs with tactile characters shall be permitted on the push side of doors with closers and without hold-open devices.

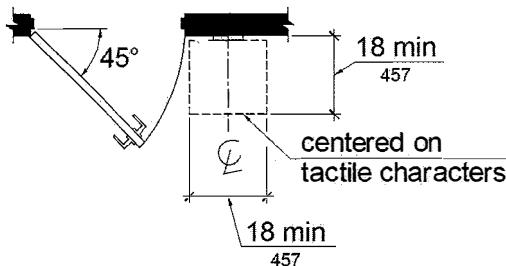


FIGURE 11B-703.4.2  
LOCATION OF TACTILE SIGNS AT DOORS

#### 11B-703.5 Visual characters.

Visual characters shall comply with Section 11B-703.5.

**Exception:** Where visual characters comply with Section 11B-703.2 and are accompanied by Braille complying with Section 11B-703.3, they shall not be required to comply with Sections 11B-703.5.2 through 11B-703.5.6, 11B-703.5.8 and 11B-703.5.9.

**11B-703.5.1 Finish and contrast.** Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

**11B-703.5.2 Case.** Characters shall be uppercase or lowercase or a combination of both.

**11B-703.5.3 Style.** Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

**11B-703.5.4 Character proportions.** Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "T".

**11B-703.5.5 Character height.** Minimum character height shall comply with Table 11B-703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "T".

**Exception:** Where provided, floor plans providing emergency procedures information in accordance with Title 19 shall not be required to comply with Section 11B-703.5.5.

**11B-703.5.6 Height from finish floor or ground.** Visual characters shall be 40 inches (1016 mm) minimum above the finish floor or ground.

#### Exceptions:

1. Visual characters indicating elevator car controls shall not be required to comply with Section 11B-703.5.6.
2. Floor-level exit signs complying with Chapter 10, Section 1011.7 shall not be required to comply with Section 11B-703.5.6.
3. Where provided, floor plans providing emergency procedures information in accordance with Title 19 shall not be required to comply with Section 11B-703.5.6.

**11B-703.5.7 Stroke thickness.** Stroke thickness of the uppercase letter "T" shall be 10 percent minimum and 20 percent maximum of the height of the character.

**11B-703.5.8 Character spacing.** Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

**11B-703.5.9 Line spacing.** Spacing between the baselines of separate lines of characters within a message shall be

TABLE 11B-703.5.5  
VISUAL CHARACTER HEIGHT

HEIGHT TO FINISH FLOOR OR GROUND FROM BASELINE OF CHARACTER	HORIZONTAL VIEWING DISTANCE	MINIMUM CHARACTER HEIGHT
40 inches (1016 mm) to less than or equal to 70 inches (1778 mm)	less than 72 inches (1829 mm)	5/8 inch (15.9 mm)
	72 inches (1829 mm) and greater	5/8 inch (15.9 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (1829 mm)
Greater than 70 inches (1778 mm) to less than or equal to 120 inches (3048 mm)	less than 180 inches (4572 mm)	2 inches (51 mm)
	180 inches (4572 mm) and greater	2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (4572 mm)
greater than 120 inches (3048 mm)	less than 21 feet (6401 mm)	3 inches (76 mm)
	21 feet (6401 mm) and greater	3 inches (76 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6401 mm)

135 percent minimum and 170 percent maximum of the character height.

**11B-703.5.10 Format.** Text shall be in a horizontal format.

**11B-703.6 Pictograms.** Pictograms shall comply with Section 11B-703.6.

**11B-703.6.1 Pictogram field.** Pictograms shall have a field height of 6 inches (152 mm) minimum. Characters and Braille shall not be located in the pictogram field.

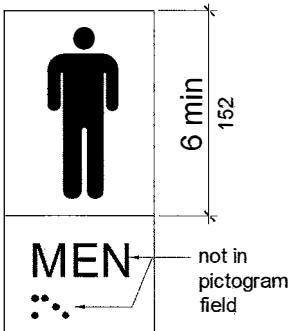


FIGURE 11B-703.6.1  
PICTOGRAM FIELD

**11B-703.6.2 Finish and contrast.** Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

**11B-703.6.3 Text descriptors.** Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with Sections 11B-703.2, 11B-703.3 and 11B-703.4.

**11B-703.7 Symbols of accessibility.** Symbols of accessibility shall comply with Section 11B-703.7.

**11B-703.7.1 Finish and contrast.** Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

**11B-703.7.2 Symbols**

**11B-703.7.2.1 International Symbol of Accessibility.**

The International Symbol of Accessibility shall comply with Figure 11B-703.7.2.1. *The symbol shall consist of a white figure on a blue background. The color blue shall approximate FS 15090 in Federal Standard 595C.*

**Exceptions:**

1. *The appropriate enforcement agency may approve other colors provided the symbol contrast is light on dark or dark on light.*
2. *On the accessibility function button on hall call consoles in a destination-oriented elevator system the International Symbol of Accessibility shall be a white symbol on a black background.*

**11B-703.7.2.2 International Symbol of TTY.**

The International Symbol of TTY shall comply with Figure 11B-703.7.2.2.

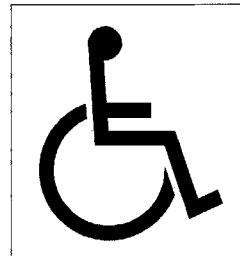


FIGURE 11B-703.7.2.1  
INTERNATIONAL SYMBOL OF ACCESSIBILITY

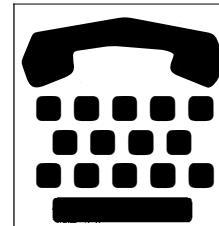


FIGURE 11B-703.7.2.2  
INTERNATIONAL SYMBOL OF TTY

**11B-703.7.2.3 Volume control telephones.** Telephones with a volume control shall be identified by a pictogram of a telephone handset with radiating sound waves on a square field such as shown in Figure 11B-703.7.2.3.

**11B-703.7.2.4 Assistive listening systems.** Assistive listening systems shall be identified by the International Symbol of Access for Hearing Loss complying with Figure 11B-703.7.2.4.



FIGURE 11B-703.7.2.3  
VOLUME CONTROL TELEPHONE

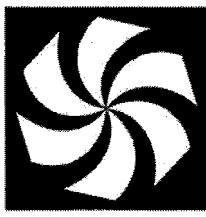


FIGURE 11B-703.7.2.4  
INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS

**11B-703.7.2.5 Cleaner Air Symbol.** Rooms, facilities and paths of travel that are accessible to and usable by people who are adversely impacted by airborne chemicals or particulate(s) and/or the use of electrical fix-

tures and/or devices shall be identified by the Cleaner Air Symbol complying with Figure 11B-703.7.2.5. This symbol is to be used strictly for publicly funded facilities or any facilities leased or rented by State of California, not concessionaires.

The symbol, which shall include the text "Cleaner Air" as shown, shall be displayed either as a negative or positive image within a square that is a minimum of 6 inches (152 mm) on each side. The symbol may be shown in black and white or in color. When color is used, it shall be Federal Blue (Color No. 15090 Federal Standard 595B) on white, or white on Federal Blue. There shall be at least a 70-percent color contrast between the background of the sign from the surface that it is mounted on.



**FIGURE 11B-703.7.2.5  
CLEANER AIR SYMBOL**

**11B-703.7.2.6 Toilet and bathing facilities geometric symbols.** Doorways leading to toilet rooms and bathing rooms shall be identified by a geometric symbol complying with Section 11B-703.7.2.6. The symbol shall be mounted at 58 inches (1473 mm) minimum and 60 inches (1524 mm) maximum above the finish floor or ground surface measured from the centerline of the symbol. Where a door is provided the symbol shall be mounted within 1 inch (25 mm) of the vertical centerline of the door.

**Exception:** Geometric symbols shall not be required at inmate toilet rooms and bathing rooms in detention and correctional facilities where only one gender is housed.

**11B-703.7.2.6.1 Men's toilet and bathing facilities.** Men's toilet and bathing facilities shall be identified by an equilateral triangle,  $\frac{1}{4}$  inch (6.4 mm) thick with edges 12 inches (305 mm) long and a vertex pointing upward. The triangle symbol shall contrast with the door, either light on a dark background or dark on a light background.

**Exception:** Within secure perimeter of detention and correctional facilities, geometric symbols shall not be required to be  $\frac{1}{4}$  inch (6.4 mm) thick.

**11B-703.7.2.6.2 Women's toilet and bathing facilities.** Women's toilet and bathing facilities shall be identified by a circle,  $\frac{1}{4}$  inch (6.4 mm) thick and 12 inches (305 mm) in diameter. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background.

**Exception:** Within secure perimeter of detention and correctional facilities, geometric symbols shall not be required to be  $\frac{1}{4}$  inch (6.4 mm) thick.

**11B-703.7.2.6.3 Unisex toilet and bathing facilities.** Unisex toilet and bathing facilities shall be identified by a circle,  $\frac{1}{4}$  inch (6.4 mm) thick and 12 inches (305 mm) in diameter with a  $\frac{1}{4}$  inch (6.4 mm) thick triangle with a vertex pointing upward superimposed on the circle and within the 12-inch (305 mm) diameter. The triangle symbol shall contrast with the circle symbol, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door, either light on a dark background or dark on a light background.

**Exception:** Within secure perimeter of detention and correctional facilities, geometric symbols shall not be required to be  $\frac{1}{4}$  inch (6.4 mm) thick.

**11B-703.7.2.6.4 Edges and corners.** Edges of signs shall be rounded, chamfered or eased. Corners of signs shall have a minimum radius of  $\frac{1}{8}$  inch (3.2 mm).

**11B-703.7.2.7 Pedestrian traffic-control buttons.** Pole-supported pedestrian traffic-control buttons shall be identified with color coding consisting of a textured horizontal yellow band 2 inches (51 mm) in width encircling the pole, and a 1-inch-wide (25 mm) dark border band above and below this yellow band. Color coding shall be placed immediately above the control button. Control buttons shall be located no higher than 48 inches (1219 mm) above the ground surface adjacent to the pole.

#### **11B-703.8 Variable message signs.**

**11B-703.8.1 General.** High resolution variable message sign (VMS) characters shall comply with Sections 11B-703.5 and 11B-703.8.12 through 11B-703.8.14. Low resolution variable message sign (VMS) characters shall comply with Section 11B-703.8.

**11B-703.8.2 Case.** Low resolution VMS characters shall be uppercase.

**11B-703.8.3 Style.** Low resolution VMS characters shall be conventional in form, shall be sans serif, and shall not be italic, oblique, script, highly decorative, or of other unusual forms.

**11B-703.8.4 Character height.** The uppercase letter "I" shall be used to determine the allowable height of all low resolution VMS characters of a font. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. The uppercase letter "I" of the font shall have a minimum height complying with Table 11B-703.8.4.

**Exception:** In assembly seating where the maximum viewing distance is 100 feet (30.5 m) or greater, the height of the uppercase "I" of low resolution VMS fonts shall be permitted to be 1 inch (25 mm) for every 30 feet (9144 mm) of viewing distance, provided the character height is 8 inches (203 mm) minimum. Viewing distance shall be measured as the horizontal distance between the character and where someone is expected to view the sign.

**11B-703.8.5 Character width.** The uppercase letter "O" shall be used to determine the allowable width of all low resolution VMS characters of a font. Low resolution VMS

characters shall comply with the pixel count for character width in Table 11B-703.8.5.

**TABLE 11B-703.8.4  
LOW RESOLUTION VMS CHARACTER HEIGHT**

HEIGHT ABOVE FLOOR TO BASELINE OF CHARACTER	HORIZONTAL VIEWING DISTANCE	MINIMUM CHARACTER HEIGHT
40 inches (1016 mm) to less than or equal to 70 inches (1778 mm)	Less than 10 feet (3048 mm)	2 inches (51 mm)
	10 feet (3048 mm) and greater	2 inches (51 mm), plus $\frac{1}{5}$ inch (5.1 mm) per foot (305 mm) of viewing distance above 10 feet (3048 mm)
Greater than 70 inches (1778 mm) to less than or equal to 120 inches (3048 mm)	Less than 15 feet (4572 mm)	3 inches (76 mm)
	15 feet (4572 mm) and greater	3 inches (76 mm), plus $\frac{1}{5}$ inch (5.1 mm) per foot (305 mm) of viewing distance above 15 feet (4572 mm)
Greater than 120 inches (3048 mm)	Less than 20 feet (6096 mm)	4 inches (102 mm)
	20 feet (6096 mm) and greater	4 inches (102 mm), plus $\frac{1}{5}$ inch (5.1 mm) per foot (305 mm) of viewing distance above 20 feet (6096 mm)

**11B-703.8.6 Stroke width.** The uppercase letter "I" shall be used to determine the allowable stroke width of all low resolution VMS characters of a font. Low resolution VMS characters shall comply with the pixel count for stroke width in Table 11B-703.8.5.

**11B-703.8.7 Character spacing.** Spacing shall be measured between the two closest points of adjacent low resolution VMS characters within a message, excluding word spaces. Low resolution VMS character spacing shall comply with the pixel count for character spacing in Table 11B-703.8.5.

**TABLE 11B-703.8.5  
PIXEL COUNT FOR LOW RESOLUTION VMS SIGNAGE**

CHARACTER HEIGHT	CHARACTER WIDTH RANGE	STROKE WIDTH RANGE	CHARACTER SPACING RANGE
7	5 6	1	2
8	6 7	1 2	2 3
9	6 8	1 2	2 3
10	7 9	2	2 4
11	8 10	2	2 4
12	8 11	2	3 4
13	9 12	2 3	3 5
14	10 13	2 3	3 5
15	11 14	2 3	3 5

**11B-703.8.8 Line spacing.** Low resolution VMS characters shall comply with Section 11B-703.5.9.

**11B-703.8.9 Height above floor.** Low resolution VMS characters shall be 40 inches (1016 mm) minimum above the floor of the viewing position, measured to the baseline of the character. Heights of low resolution variable message sign characters shall comply with Table 11B-703.8.4, based on the size of the characters on the sign.

**11B-703.8.10 Finish.** The background of low resolution VMS characters shall have a nonglare finish.

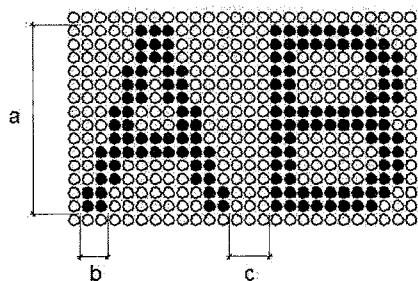
**11B-703.8.11 Contrast.** Low resolution VMS characters shall be light characters on a dark background.

**11B-703.8.12 Protective covering.** Where a protective layer is placed over VMS characters through which the VMS characters must be viewed, the protective covering shall have a nonglare finish.

**11B-703.8.13 Brightness.** The brightness of variable message signs in exterior locations shall automatically adjust in response to change in ambient light levels.

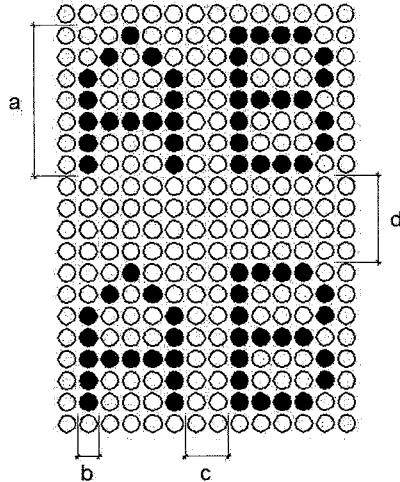
**11B-703.8.14 Rate of change.** Where a VMS message can be displayed in its entirety on a single screen, it shall be displayed on a single screen and shall remain motionless.

**Example 1**



	Property	Example 1	Example 2
a	Character Height	14 Pixels	7 Pixels
b	Stroke Width	2 Pixels	1 Pixels
c	Character Spacing	3 Pixels	2 Pixels
d	Line Spacing		4 Pixels

**Example 2**



**FIGURE 11B-703.8.5  
LOW RESOLUTION VMS SIGNAGE CHARACTERS**

on the screen for a minimum 3 seconds or 1 second minimum for every seven characters of the message including spaces, whichever is longer.

#### 11B-704 Telephones

**11B-704.1 General.** Public telephones shall comply with Section 11B-704.

**11B-704.2 Wheelchair accessible telephones.** Wheelchair accessible telephones shall comply with Section 11B-704.2.

**11B-704.2.1 Clear floor or ground space.** A clear floor or ground space complying with Section 11B-305 shall be provided. The clear floor or ground space shall not be obstructed by bases, enclosures, or seats.

**11B-704.2.1.1 Parallel approach.** Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of the telephone unit shall be 10 inches (254 mm) maximum.

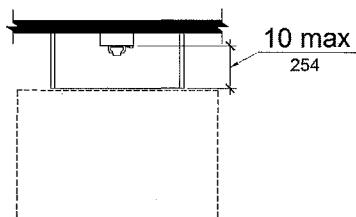


FIGURE 11B-704.2.1.1  
PARALLEL APPROACH TO TELEPHONE

**11B-704.2.1.2 Forward approach.** Where a forward approach is provided at a telephone within an enclosure, the counter may extend beyond the face of the telephone 20 inches (508 mm) into the required clear floor or ground space and the enclosure may extend beyond the face of the telephone 24 inches (610 mm). If an additional 6 inches (152 mm) in width of clear floor space is provided, creating a clear floor space of 36 inches by 48 inches (914 mm by 1219 mm), the enclosure may extend more than 24 inches (610 mm) beyond the face of the telephone.

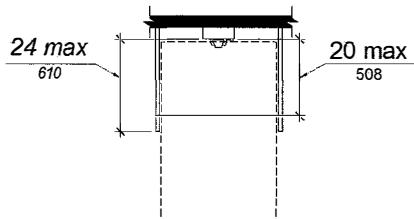


FIGURE 11B-704.2.1.2  
FORWARD APPROACH TO TELEPHONE

**11B-704.2.2 Operable parts.** Operable parts shall comply with Section 11B-309. Telephones shall have push-button controls where such service is available.

**11B-704.2.3 Telephone directories.** Telephone directories, where provided, shall be located in accordance with Section 11B-309.

**11B-704.2.4 Cord length.** The cord from the telephone to the handset shall be 29 inches (737 mm) long minimum.

**11B-704.3 Volume control telephones.** Public telephones required to have volume controls shall be equipped with a receive volume control that provides a gain adjustable up to 20 dB minimum. For incremental volume control, provide at least one intermediate step of 12 dB of gain minimum. An automatic reset shall be provided. *Volume control telephones shall be equipped with a receiver that generates a magnetic field in the area of the receiver cap. Public telephones with volume control shall be hearing aid compatible.*

**11B-704.4 TTYS.** TTYS provided at a public pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the TTY and the telephone receiver.

**11B-704.4.1 Height.** When in use, the touch surface of TTY keypads shall be 34 inches (864 mm) minimum above the finish floor.

**Exception:** Where seats are provided, TTYS shall not be required to comply with Section 11B-704.4.1.

**11B-704.5 TTY shelf.** Public pay telephones required to accommodate portable TTYS shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a TTY and shall have 6 inches (152 mm) minimum vertical clearance above the area where the TTY is to be placed.

**11B-705 Detectable warnings and detectable directional texture**

#### 11B-705.1 Detectable warnings

**11B-705.1.1 General.** Detectable warnings shall consist of a surface of truncated domes and shall comply with Section 11B-705.

**11B-705.1.1.1 Dome size.** Truncated domes in a detectable warning surface shall have a base diameter of 0.9 inch (22.9 mm) minimum and 0.92 inch (23.4 mm) maximum, a top diameter of 0.45 inch (11.4 mm) minimum and 0.47 inch (11.9 mm) maximum, and a

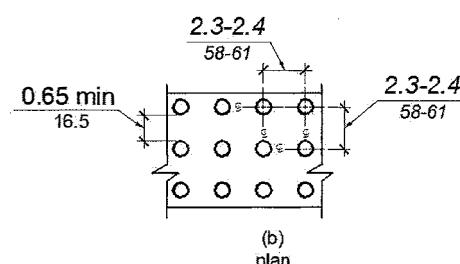
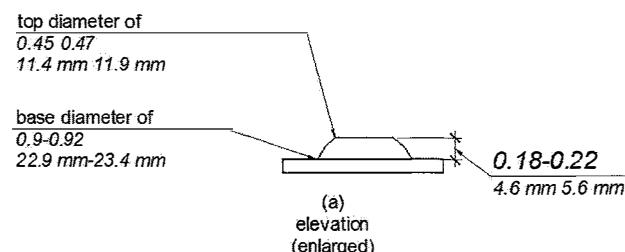


FIGURE 11B-705.1  
SIZE AND SPACING OF TRUNCATED DOMES

height of 0.18 inch (4.6 mm) minimum and 0.22 inch (5.6 mm) maximum.

**11B-705.1.1.2 Dome spacing.** Truncated domes in a detectable warning surface shall have a center-to-center spacing of 2.3 inches (58 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inch (16.5 mm) minimum, measured between the most adjacent domes on a square grid.

**Exception:** Where installed in a radial pattern, truncated domes shall have a center-to-center spacing of 1.6 inches (41 mm) minimum to 2.4 inches (61 mm) maximum.

**11B-705.1.1.3 Color and contrast.** Detectable warning surfaces at transit boarding platform edges, bus stops, hazardous vehicular areas, reflecting pools, and track crossings shall comply with Section 11B-705.1.1.3.1. Detectable warnings at other locations shall comply with either Section 11B-705.1.1.3.1 or Section 11B-705.1.1.3.2. The material used to provide visual contrast shall be an integral part of the surface.

**11B-705.1.1.3.1** Detectable warning surfaces shall be yellow and approximate FS 33538 of Federal Standard 595C.

**11B-705.1.1.3.2** Detectable warning surfaces shall provide a 70 percent minimum visual contrast with adjacent walking surfaces. Contrast in percent shall be determined by:

$$\text{Contrast percent} = [(B1-B2)/B1] \times 100 \text{ where}$$

B1 = light reflectance value (LRV) of the lighter area and

B2 = light reflectance value (LRV) of the darker area.

**Exception:** Where the detectable warning surface does not provide a 70 percent minimum contrast with adjacent walking surfaces, a 1-inch (25 mm) wide minimum visually contrasting surface shall separate the detectable warning from adjacent walking surfaces. The visually contrasting surface shall contrast with both the detectable warning and adjacent walking surfaces either light-on-dark, or dark-on-light.

**11B-705.1.1.4 Resiliency.** Detectable warning surfaces shall differ from adjoining surfaces in resiliency or sound-on-cane contact.

**Exception:** Detectable warning surfaces at curb ramps, islands or cut-through medians shall not be required to comply with Section 11B-705.1.1.4.

**11B-705.1.2 Locations.** Detectable warnings at the following locations shall comply with Section 11B-705.1.

**11B-705.1.2.1 Platform edges.** Detectable warning surfaces at platform boarding edges shall be 24 inches (610 mm) wide and shall extend the full length of the public use areas of the platform.

**11B-705.1.2.2 Curb ramps.** Detectable warnings at curb ramps shall extend 36 inches (914 mm) in the direction of travel. Detectable warnings shall extend the full width of the ramp run less 2 inches (51 mm) maximum on each side, excluding any flared sides.

Detectable warnings shall be located so the edge nearest the curb is 6 inches (152 mm) minimum and 8 inches (203 mm) maximum from the line at the face of the curb marking the transition between the curb and the gutter, street or highway.

**Exception:** On parallel curb ramps, detectable warnings shall be placed on the turning space at the flush transition between the street and sidewalk. Detectable warnings shall extend the full width of the turning space at the flush transition between the street and the sidewalk less 2 inches (51 mm) maximum on each side.

**11B-705.1.2.3 Islands or cut-through medians.** Detectable warnings at pedestrian islands or cut-through medians shall be 36 inches (914 mm) minimum in depth extending the full width of the pedestrian path or cut-through less 2 inches (51 mm) maximum on each side, placed at the edges of the pedestrian island or cut-through median, and shall be separated by 24 inches (610 mm) minimum of walking surface without detectable warnings.

**Exception:** Detectable warnings shall be 24 inches (610 mm) minimum in depth at pedestrian islands or cut-through medians that are less than 96 inches (2438 mm) in length in the direction of pedestrian travel.

**11B-705.1.2.4 Bus stops.** When detectable warnings are provided at bus stop boarding and alighting areas, the detectable warnings shall extend the full width of the boarding/alighting area and shall be 36 inches (914 mm) minimum in depth.

**11B-705.1.2.5 Hazardous vehicular areas.** Detectable warnings at hazardous vehicular areas shall be 36 inches (914 mm) in width.

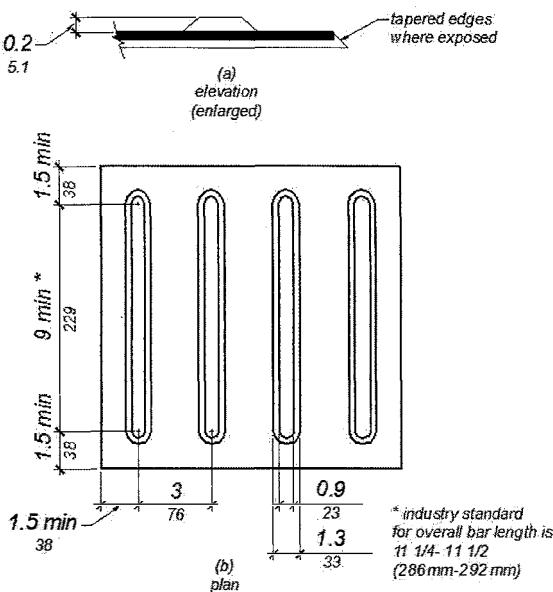
**11B-705.1.2.6 Reflecting pools.** When detectable warnings are provided at reflecting pools, it shall be 24 inches (610 mm) minimum and 36 inches (914 mm) maximum in width.

**11B-705.1.2.7 Track crossings.** Detectable warnings at track crossings shall be 36 inches (914 mm) in the direction of pedestrian travel and extend the full width of the circulation path.

**11B-705.2 Detectable directional texture.** Detectable directional texture at transit boarding platforms shall comply with Figure 11B-705.2 and shall be 0.1 inch (2.5 mm) in height that tapers off to 0.04 inch (1.0 mm), with bars raised 0.2 inch (5.1 mm) from the surface. The raised bars shall be 1.3 inches (33 mm) wide and 3 inches (76 mm) from center-to-center of each bar. This surface shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact. The color shall be yellow and approximate FS 33538 of Federal Standard 595C. This surface will be placed directly behind the yellow detectable warning texture specified in Section 11B-705.1.2.1, aligning with all doors of the transit vehicles where passengers will embark. The width of the directional texture shall be equal to the width of the transit vehicle's door opening. The depth of the texture shall not be less than 36 inches (914 mm).

**11B-705.3 Product approval.** Only approved DSA-AC detectable warning products and directional surfaces shall be installed as provided in the California Code of Regulations (CCR), Title 24, Part 1, Chapter 5, Articles 2, 3 and 4. Refer to CCR Title 24, Part 12, Chapter 11B, Section 12-

**11B.205** for building and facility access specifications for product approval for detectable warning products and directional surfaces.



**FIGURE 11B-705.2  
DETECTABLE DIRECTIONAL TEXTURE**

### **11B-706 Assistive listening systems**

**11B-706.1 General.** Assistive listening systems required in assembly areas, conference and meeting rooms shall comply with Section 11B-706.

**11B-706.2 Receiver jacks.** Receivers required for use with an assistive listening system shall include a  $\frac{1}{8}$  inch (3.2 mm) standard mono jack.

**11B-706.3 Receiver hearing-aid compatibility.** Receivers required to be hearing-aid compatible shall interface with telecoils in hearing aids through the provision of neckloops.

**11B-706.4 Sound pressure level.** Assistive listening systems shall be capable of providing a sound pressure level of 110 dB minimum and 118 dB maximum with a dynamic range on the volume control of 50 dB.

**11B-706.5 Signal-to-noise ratio.** The signal-to-noise ratio for internally generated noise in assistive listening systems shall be 18 dB minimum.

**11B-706.6 Peak clipping level.** Peak clipping shall not exceed 18 dB of clipping relative to the peaks of speech.

### **11B-707 Automatic teller machines, fare machines and point-of-sale devices**

**11B-707.1 General.** Automatic teller machines, fare machines and point-of-sale devices shall comply with Section 11B-707.

**11B-707.2 Clear floor or ground space.** A clear floor or ground space complying with Section 11B-305 shall be provided.

**Exception:** Clear floor or ground space shall not be required at drive-up only automatic teller machines and fare machines.

**11B-707.3 Operable parts.** Operable parts shall comply with Section 11B-309. Unless a clear or correct key is provided,

each operable part shall be able to be differentiated by sound or touch, without activation.

**Exception:** Drive-up only automatic teller machines and fare machines shall not be required to comply with Sections 11B-309.2 and 11B-309.3.

**11B-707.4 Privacy.** Automatic teller machines shall provide the opportunity for the same degree of privacy of input and output available to all individuals.

**11B-707.5 Speech output.** Machines shall be speech enabled. Operating instructions and orientation, visible transaction prompts, user input verification, error messages, and all displayed information for full use shall be accessible to and independently usable by individuals with vision impairments. Speech shall be delivered through a mechanism that is readily available to all users, including but not limited to, an industry standard connector or a telephone handset. Speech shall be recorded or digitized human, or synthesized.

#### **Exceptions:**

1. Audible tones shall be permitted instead of speech for visible output that is not displayed for security purposes, including but not limited to, asterisks representing personal identification numbers.
2. Advertisements and other similar information shall not be required to be audible unless they convey information that can be used in the transaction being conducted.
3. Where speech synthesis cannot be supported, dynamic alphabetic output shall not be required to be audible.

**11B-707.5.1 User control.** Speech shall be capable of being repeated or interrupted. Volume control shall be provided for the speech function.

**Exception:** Speech output for any single function shall be permitted to be automatically interrupted when a transaction is selected.

**11B-707.5.2 Receipts.** Where receipts are provided, speech output devices shall provide audible balance inquiry information, error messages, and all other information on the printed receipt necessary to complete or verify the transaction.

#### **Exceptions:**

1. Machine location, date and time of transaction, customer account number, and the machine identifier shall not be required to be audible.
2. Information on printed receipts that duplicates information available on-screen shall not be required to be presented in the form of an audible receipt.
3. Printed copies of bank statements and checks shall not be required to be audible.

**11B-707.6 Input.** Input devices shall comply with Section 11B-707.6.

**11B-707.6.1 Input controls.** At least one tactilely discernible input control shall be provided for each function. Where provided, key surfaces not on active areas of display screens, shall be raised above surrounding surfaces. Where membrane keys are the only method of input, each shall be tactilely discernible from surrounding surfaces and adjacent keys.

**11B-707.6.2 Numeric keys.** Numeric keys shall be arranged in a 12-key ascending or descending telephone keypad layout. The number five key shall be tactilely distinct from the other keys.

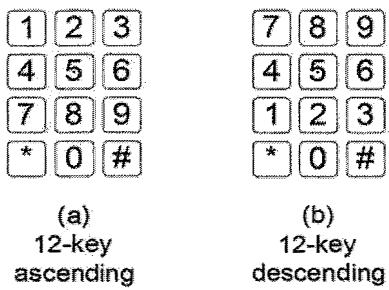


FIGURE 11B-707.6.2  
NUMERIC KEY LAYOUT

**11B-707.6.3 Function keys.** Function keys shall comply with Section 11B-707.6.3.

**11B-707.6.3.1 Contrast.** Function keys shall contrast visually from background surfaces. Characters and symbols on key surfaces shall contrast visually from key surfaces. Visual contrast shall be either light-on-dark or dark-on-light.

**Exception:** Tactile symbols required by Section 11B-707.6.3.2 shall not be required to comply with Section 11B-707.6.3.1.

**11B-707.6.3.2 Tactile symbols.** Function key surfaces shall have tactile symbols as follows: Enter or Proceed key: raised circle; Clear or Correct key: raised left arrow; Cancel key: raised letter ex; Add Value key: raised plus sign; Decrease Value key: raised minus sign.

**11B-707.7 Display screen.** The display screen shall comply with Section 11B-707.7.

**Exception:** Drive-up only automatic teller machines and fare machines shall not be required to comply with Section 11B-707.7.1.

**11B-707.7.1 Visibility.** The display screen shall be visible from a point located 40 inches (1016 mm) above the center of the clear floor space in front of the machine.

**11B-707.7.1.1 Vertically mounted display screen.** Where display screens are mounted vertically or no more than 30 degrees tipped away from the viewer, the center line of the display screen and other display devices shall be no more than 52 inches (1321 mm) above the floor or ground surface.

**11B-707.7.1.2 Angle-mounted display screen.** Where display screens are mounted between 30 degrees and 60 degrees tipped away from the viewer, the center line of the display screen and other display devices shall be no more than 44 inches (1118 mm) above the floor or ground surface.

**11B-707.7.1.3 Horizontally mounted display screen.** Where display screens are mounted no less than 60 degrees and no more than 90 degrees (horizontal) tipped away from the viewer, the center line of the display screen and other display devices shall be no more than 34 inches (864 mm) above the floor or ground surface.

**11B-707.7.2 Characters.** Characters displayed on the screen shall be in a sans serif font. Characters shall be  $\frac{3}{16}$  inch (4.8 mm) high minimum based on the uppercase letter "T". Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

inch (4.8 mm) high minimum based on the uppercase letter "T". Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

**11B-707.8 Braille instructions.** Braille instructions for initiating the speech mode shall be provided. Braille shall comply with Section 11B-703.3.

**11B-707.9 Point-of-sale devices.** Point-of-sale devices shall comply with Section 11B-707.9.

**11B-707.9.1 General.** Where point-of-sale devices are provided, all devices at each location shall comply with Sections 11B-309.4, 11B-707.3 and 11B-707.7.2. In addition, point-of-sale systems that include a video touch screen or any other nontactile keypad shall be equipped with either of the following:

**11B-707.9.1.1 Tactilely discernible numerical keypad.** A tactilely discernible numerical keypad similar to a telephone keypad containing a raised dot with a dot base diameter between 1.5 mm and 1.6 mm and a height between 0.6 mm and 0.9 mm on the number 5 key that enables a visually impaired person to enter his or her own personal identification number or any other personal information necessary to process the transaction in a manner that provides the opportunity for the same degree of privacy input and output available to all individuals.

**11B-707.9.1.2 Other technology.** Other technology, such as a radio frequency identification device, finger-print biometrics, or some other mechanism that enables a visually impaired person to access the video touch screen device with his or her personal identifier and to process his or her transaction in a manner that provides the opportunity for the same degree of privacy input and output available to all individuals. Where a video screen overlay is provided it shall be equipped with a tactilely discernible numerical keypad complying with Section 11B-707.9.1.1.

**11B-707.9.2 Point-of-sale devices at check stands and sales or service counters.** Where point-of-sale devices are provided at check stands and sales or service counters, they shall comply with Section 11B-707.9.1, and shall also comply with Sections 11B-707.2, 11B-707.3 and 11B-707.4.

## 11B-708 Two-way communication systems

**11B-708.1 General.** Two-way communication systems shall comply with Section 11B-708.

**11B-708.2 Audible and visual indicators.** The system shall provide both audible and visual signals.

**11B-708.3 Handsets.** Handset cords, if provided, shall be 29 inches (737 mm) long minimum.

**11B-708.4 Residential dwelling unit communication systems.** Communications systems between a residential dwelling unit and a site, building, or floor entrance shall comply with Section 11B-708.4.

**11B-708.4.1 Common use or public use system interface.** The common use or public use system interface shall include the capability of supporting voice and TTY communication with the residential dwelling unit interface.

**11B-708.4.2 Residential dwelling unit interface.** The residential dwelling unit system interface shall include a telephone jack capable of supporting voice and TTY communication with the common use or public use system interface.

## DIVISION 8: SPECIAL ROOMS, SPACES, AND ELEMENTS

### **11B-801 General**

**11B-801.1 Scope.** The provisions of *Division 8* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

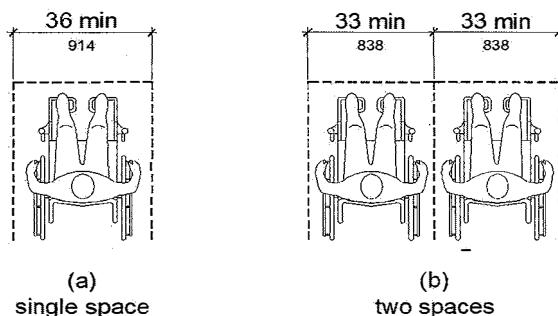
### **11B-802 Wheelchair spaces, companion seats, and designated aisle seats and semi-ambulant seats**

**11B-802.1 Wheelchair spaces.** Wheelchair spaces shall comply with *Section 11B-802.1*.

**11B-802.1.1 Floor or ground surface.** The floor or ground surface of wheelchair spaces shall comply with *Section 11B-302*. Changes in level are not permitted.

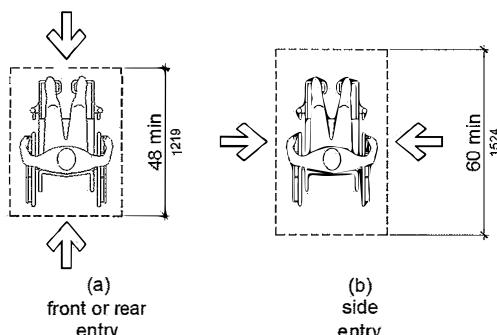
**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-802.1.2 Width.** A single wheelchair space shall be 36 inches (914 mm) wide minimum. Where two adjacent wheelchair spaces are provided, each wheelchair space shall be 33 inches (838 mm) wide minimum.



**FIGURE 11B-802.1.2  
WIDTH OF WHEELCHAIR SPACES**

**11B-802.1.3 Depth.** Where a wheelchair space can be entered from the front or rear, the wheelchair space shall be 48 inches (1219 mm) deep minimum. Where a wheelchair space can be entered only from the side, the wheelchair space shall be 60 inches (1524 mm) deep minimum.



**FIGURE 11B-802.1.3  
DEPTH OF WHEELCHAIR SPACES**

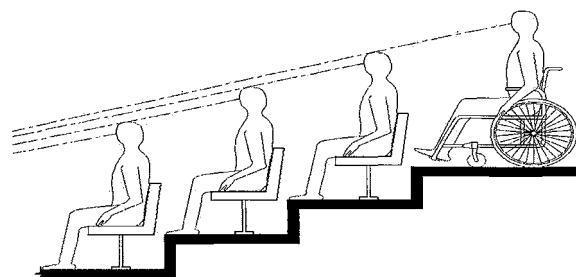
**11B-802.1.4 Approach.** Wheelchair spaces shall adjoin accessible routes. Accessible routes shall not overlap wheelchair spaces.

**11B-802.1.5 Overlap.** Wheelchair spaces shall not overlap circulation paths.

**11B-802.2 Lines of sight.** Lines of sight to the screen, performance area, or playing field for spectators in wheelchair spaces shall comply with *Section 11B-802.2*.

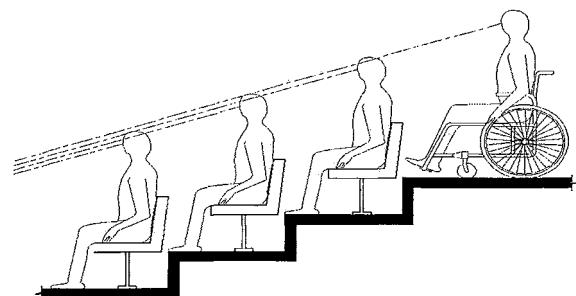
**11B-802.2.1 Lines of sight over seated spectators.** Where spectators are expected to remain seated during events, spectators in wheelchair spaces shall be afforded lines of sight complying with *Section 11B-802.2.1*.

**11B-802.2.1.1 Lines of sight over heads.** Where spectators are provided lines of sight over the heads of spectators seated in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the heads of seated spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.1.1  
LINES OF SIGHT OVER THE HEADS OF SEATED SPECTATORS**

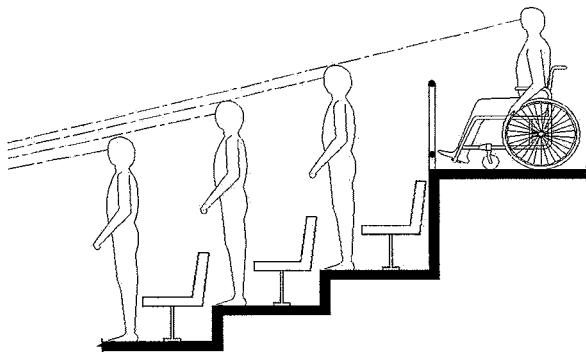
**11B-802.2.1.2 Lines of sight between heads.** Where spectators are provided lines of sight over the shoulders and between the heads of spectators seated in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the shoulders and between the heads of seated spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.1.2  
LINES OF SIGHT BETWEEN THE  
HEADS OF SEATED SPECTATORS**

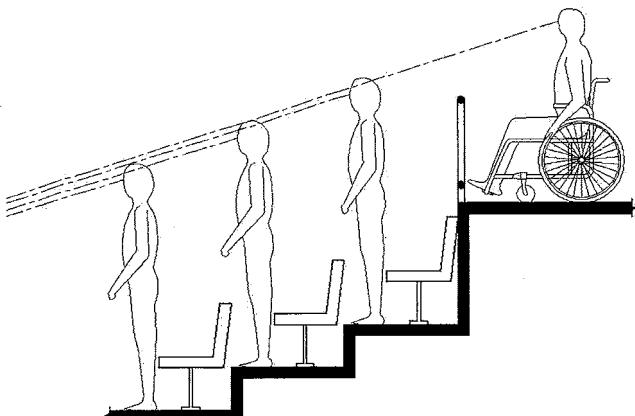
**11B-802.2.2 Lines of sight over standing spectators.** Where spectators are expected to stand during events, spectators in wheelchair spaces shall be afforded lines of sight complying with *Section 11B-802.2.2*.

**11B-802.2.2.1 Lines of sight over heads.** Where standing spectators are provided lines of sight over the heads of spectators standing in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the heads of standing spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.2.1  
LINES OF SIGHT OVER THE  
HEADS OF STANDING SPECTATORS**

**11B-802.2.2.2 Lines of sight between heads.** Where standing spectators are provided lines of sight over the shoulders and between the heads of spectators standing in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the shoulders and between the heads of standing spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.2.2  
LINES OF SIGHT BETWEEN THE  
HEADS OF STANDING SPECTATORS**

**11B-802.3 Companion seats.** Companion seats shall comply with *Section 11B-802.3*.

**11B-802.3.1 Alignment.** In row seating, companion seats shall be located to provide shoulder alignment with adjacent wheelchair spaces. The shoulder alignment point of the wheelchair space shall be measured 36 inches (914 mm) from the front of the wheelchair space. The floor surface of the companion seat shall be at the same elevation as the floor surface of the wheelchair space.

**11B-802.3.2 Type.** Companion seats shall be equivalent in size, quality, comfort, and amenities to the seating in the immediate area. Companion seats shall be permitted to be movable.

**11B-802.4 Designated aisle seats.** Designated aisle seats shall comply with *Section 11B-802.4*.

**11B-802.4.1 Armrests.** Where armrests are provided on the seating in the immediate area, folding or retractable armrests shall be provided on the aisle side of the seat.

**11B-802.4.2 Identification.** Each designated aisle seat shall be identified by a sign or marker with the *International Symbol of Accessibility* complying with *Section 11B-703.7.2.1*. Signage complying with *Section 11B-703.5*, notifying patrons of the availability of such seats shall be posted at the ticket office.

**11B-802.5 Semi-ambulant seats.** Semi-ambulant seats shall provide at least 24 inches (610 mm) clear leg space between the front of the seat to the nearest obstruction or to the back of the seat immediately in front.

### 11B-803 Dressing, fitting, and locker rooms

**11B-803.1 General.** Dressing, fitting and locker rooms shall comply with *Section 11B-803*.

**11B-803.2 Turning space.** Turning space complying with *Section 11B-304* shall be provided within the room.

**11B-803.3 Door swing.** Doors shall not swing into the room unless a turning space complying with *Section 11B-304.3* is provided beyond the arc of the door swing.

**11B-803.4 Benches.** A bench complying with *Section 11B-903* shall be provided within the room.

**11B-803.5 Coat hooks and shelves.** Coat hooks provided within the room shall be located within one of the reach ranges specified in *Section 11B-308*. Shelves shall be 40 inches (1016 mm) minimum and 48 inches (1219 mm) maximum above the finish floor or ground. Coat hooks shall not be located above the bench or other seating in the room.

**11B-803.6 Mirrors.** Mirrors shall be installed with the bottom edge of the reflecting surface 20 inches (508 mm) maximum above the finish floor or ground. Mirrors shall be full length with a reflective surface 18 inches (457 mm) wide minimum by 54 inches (1372 mm) high minimum and shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.

### 11B-804 Kitchens, kitchenettes, and wet bars

**11B-804.1 General.** Kitchens, kitchenettes, and wet bars shall comply with *Section 11B-804*.

**11B-804.2 Clearance.** Where a pass through kitchen is provided, clearances shall comply with *Section 11B-804.2.1*.

## DIVISION 8:

### SPECIAL ROOMS, SPACES, AND ELEMENTS

#### **11B-801 General**

**11B-801.1 Scope.** The provisions of *Division 8* shall apply where required by *Division 2* or where referenced by a requirement in this *chapter*.

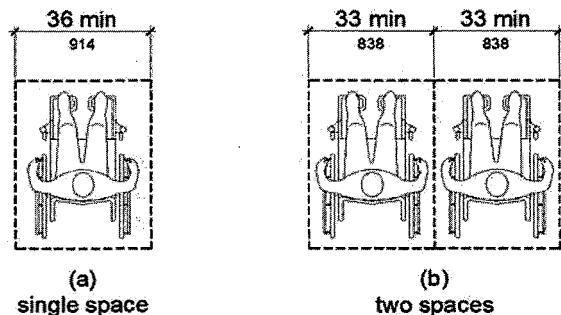
#### **11B-802 Wheelchair spaces, companion seats, and designated aisle seats and semi-ambulant seats**

**11B-802.1 Wheelchair spaces.** Wheelchair spaces shall comply with *Section 11B-802.1*.

**11B-802.1.1 Floor or ground surface.** The floor or ground surface of wheelchair spaces shall comply with *Section 11B-302*. Changes in level are not permitted.

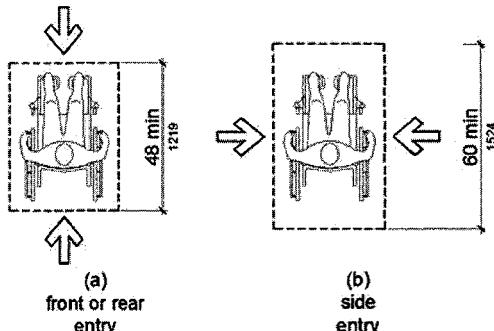
**Exception:** Slopes not steeper than 1:48 shall be permitted.

**11B-802.1.2 Width.** A single wheelchair space shall be 36 inches (914 mm) wide minimum. Where two adjacent wheelchair spaces are provided, each wheelchair space shall be 33 inches (838 mm) wide minimum.



**FIGURE 11B-802.1.2  
WIDTH OF WHEELCHAIR SPACES**

**11B-802.1.3 Depth.** Where a wheelchair space can be entered from the front or rear, the wheelchair space shall be 48 inches (1219 mm) deep minimum. Where a wheelchair space can be entered only from the side, the wheelchair space shall be 60 inches (1524 mm) deep minimum.



**FIGURE 11B-802.1.3  
DEPTH OF WHEELCHAIR SPACES**

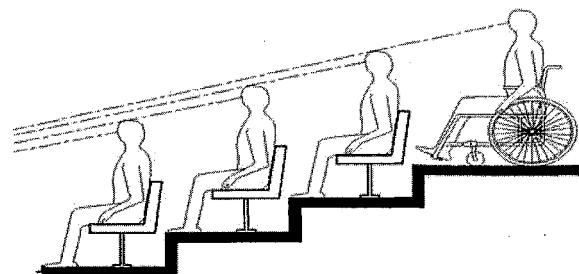
**11B-802.1.4 Approach.** Wheelchair spaces shall adjoin accessible routes. Accessible routes shall not overlap wheelchair spaces.

**11B-802.1.5 Overlap.** Wheelchair spaces shall not overlap circulation paths.

**11B-802.2 Lines of sight.** Lines of sight to the screen, performance area, or playing field for spectators in wheelchair spaces shall comply with *Section 11B-802.2*.

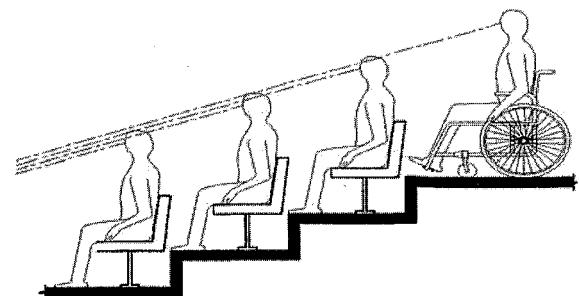
**11B-802.2.1 Lines of sight over seated spectators.** Where spectators are expected to remain seated during events, spectators in wheelchair spaces shall be afforded lines of sight complying with *Section 11B-802.2.1*.

**11B-802.2.1.1 Lines of sight over heads.** Where spectators are provided lines of sight over the heads of spectators seated in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the heads of seated spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.1.1  
LINES OF SIGHT OVER THE HEADS OF SEATED SPECTATORS**

**11B-802.2.1.2 Lines of sight between heads.** Where spectators are provided lines of sight over the shoulders and between the heads of spectators seated in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the shoulders and between the heads of seated spectators in the first row in front of wheelchair spaces.

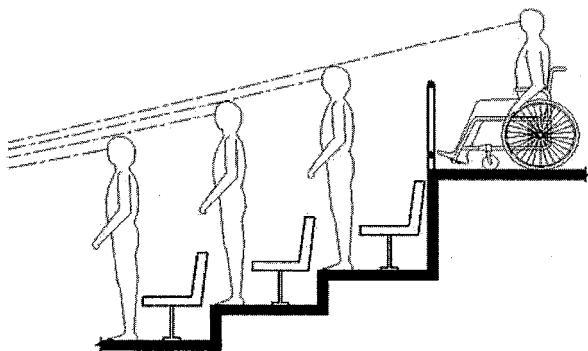


**FIGURE 11B-802.2.1.2  
LINES OF SIGHT BETWEEN THE  
HEADS OF SEATED SPECTATORS**

**11B-802.2.2 Lines of sight over standing spectators.**

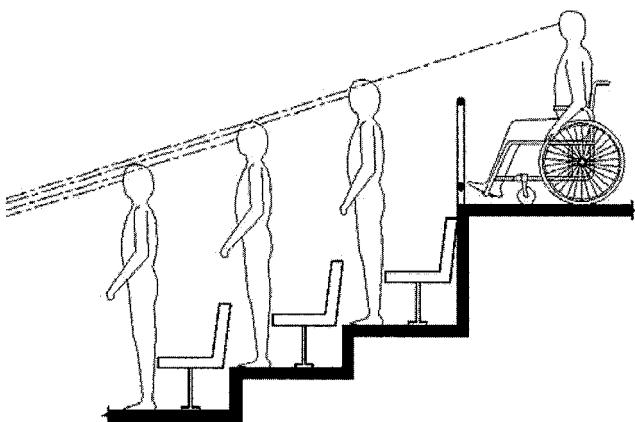
Where spectators are expected to stand during events, spectators in wheelchair spaces shall be afforded lines of sight complying with *Section 11B-802.2.2*.

**11B-802.2.2.1 Lines of sight over heads.** Where standing spectators are provided lines of sight over the heads of spectators standing in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the heads of standing spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.2.1  
LINES OF SIGHT OVER THE  
HEADS OF STANDING SPECTATORS**

**11B-802.2.2.2 Lines of sight between heads.** Where standing spectators are provided lines of sight over the shoulders and between the heads of spectators standing in the first row in front of their seats, spectators seated in wheelchair spaces shall be afforded lines of sight over the shoulders and between the heads of standing spectators in the first row in front of wheelchair spaces.



**FIGURE 11B-802.2.2.2  
LINES OF SIGHT BETWEEN THE  
HEADS OF STANDING SPECTATORS**

**11B-802.3 Companion seats.** Companion seats shall comply with *Section 11B-802.3*.

**11B-802.3.1 Alignment.** In row seating, companion seats shall be located to provide shoulder alignment with adjacent wheelchair spaces. The shoulder alignment point of the wheelchair space shall be measured 36 inches (914 mm) from the front of the wheelchair space. The floor surface of the companion seat shall be at the same elevation as the floor surface of the wheelchair space.

**11B-802.3.2 Type.** Companion seats shall be equivalent in size, quality, comfort, and amenities to the seating in the immediate area. Companion seats shall be permitted to be movable.

**11B-802.4 Designated aisle seats.** Designated aisle seats shall comply with *Section 11B-802.4*.

**11B-802.4.1 Armrests.** Where armrests are provided on the seating in the immediate area, folding or retractable armrests shall be provided on the aisle side of the seat.

**11B-802.4.2 Identification.** Each designated aisle seat shall be identified by a sign or marker with the *International Symbol of Accessibility* complying with *Section 11B-703.7.2.1*. Signage complying with *Section 11B-703.5*, notifying patrons of the availability of such seats shall be posted at the ticket office.

**11B-802.5 Semi-ambulant seats.** Semi-ambulant seats shall provide at least 24 inches (610 mm) clear leg space between the front of the seat to the nearest obstruction or to the back of the seat immediately in front.

**11B-803 Dressing, fitting, and locker rooms**

**11B-803.1 General.** Dressing, fitting and locker rooms shall comply with *Section 11B-803*.

**11B-803.2 Turning space.** Turning space complying with *Section 11B-304* shall be provided within the room.

**11B-803.3 Door swing.** Doors shall not swing into the room unless a turning space complying with *Section 11B-304.3* is provided beyond the arc of the door swing.

**11B-803.4 Benches.** A bench complying with *Section 11B-903* shall be provided within the room.

**11B-803.5 Coat hooks and shelves.** Coat hooks provided within the room shall be located within one of the reach ranges specified in *Section 11B-308*. Shelves shall be 40 inches (1016 mm) minimum and 48 inches (1219 mm) maximum above the finish floor or ground. Coat hooks shall not be located above the bench or other seating in the room.

**11B-803.6 Mirrors.** Mirrors shall be installed with the bottom edge of the reflecting surface 20 inches (508 mm) maximum above the finish floor or ground. Mirrors shall be full length with a reflective surface 18 inches (457 mm) wide minimum by 54 inches (1372 mm) high minimum and shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.

**11B-804 Kitchens and kitchenettes**

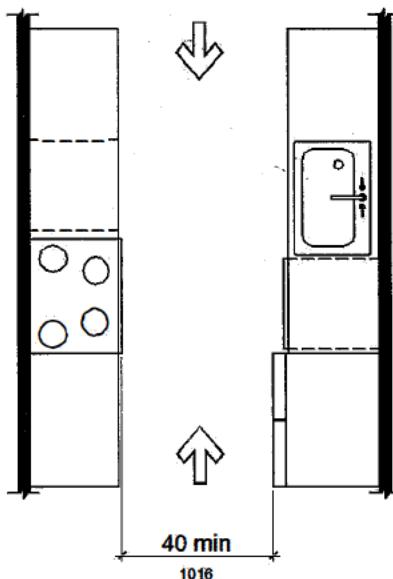
**11B-804.1 General.** Kitchens and kitchenettes shall comply with *Section 11B-804*.

**11B-804.2 Clearance.** Where a pass through kitchen is provided, clearances shall comply with *Section 11B-804.2.1*.

Where a U-shaped kitchen is provided, clearances shall comply with *Section 11B-804.2.2*.

**Exception:** Spaces that do not provide a cooktop or conventional range shall not be required to comply with *Section 11B-804.2*.

**11B-804.2.1 Pass through kitchen.** In pass through kitchens where counters, appliances or cabinets are on two opposing sides, or where counters, appliances or cabinets are opposite a parallel wall, clearance between all opposing base cabinets, counter tops, appliances, or walls within kitchen work areas shall be 40 inches (1016 mm) minimum. Pass through kitchens shall have two entries.



**FIGURE 11B-804.2.1  
PASS THROUGH KITCHENS**

**11B-804.2.2 U-shaped.** In U-shaped kitchens enclosed on three contiguous sides, clearance between all opposing base cabinets, counter tops, appliances, or walls within kitchen work areas shall be 60 inches (1524 mm) minimum.

**11B-804.3 Kitchen work surface.** In residential dwelling units required to comply with *Section 11B-809*, at least one 30 inches (762 mm) wide minimum section of counter shall provide a kitchen work surface that complies with *Section 11B-804.3*.

**11B-804.3.1 Clear floor or ground space.** A clear floor space complying with *Section 11B-305* positioned for a forward approach shall be provided. The clear floor or ground space shall be centered on the kitchen work surface and shall provide knee and toe clearance complying with *Section 11B-306*.

**Exception:** Cabinetry shall be permitted under the kitchen work surface provided that all of the following conditions are met:

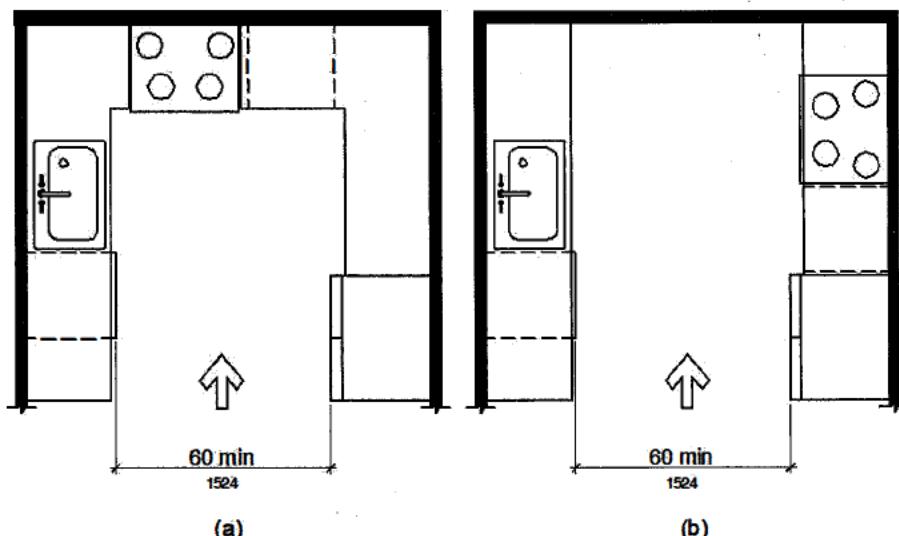
- (a) the cabinetry can be removed without removal or replacement of the kitchen work surface;
- (b) the finish floor extends under the cabinetry; and
- (c) the walls behind and surrounding the cabinetry are finished.

**11B-804.3.2 Height.** The kitchen work surface shall be 34 inches (864 mm) maximum above the finish floor or ground.

**Exception:** A counter that is adjustable to provide a kitchen work surface at variable heights, 29 inches (737 mm) minimum and 36 inches (914 mm) maximum, shall be permitted.

**11B-804.3.3 Exposed surfaces.** There shall be no sharp or abrasive surfaces under the work surface counters.

**11B-804.4 Sinks.** Sinks shall comply with *Section 11B-606*.



**FIGURE 11B-804.2.2  
U-SHAPED KITCHENS**

**11B-804.5 Storage.** At least 50 percent of shelf space in storage facilities shall comply with Section 11B-811.

**11B-804.6 Appliances.** Where provided, kitchen appliances shall comply with Section 11B-804.6.

**11B-804.6.1 Clear floor or ground space.** A clear floor or ground space complying with Section 11B-305 shall be provided at each kitchen appliance. Clear floor or ground spaces shall be permitted to overlap.

**11B-804.6.2 Operable parts.** All appliance controls shall comply with Section 11B-309.

**Exceptions:**

1. Appliance doors and door latching devices shall not be required to comply with Section 11B-309.4.
2. Bottom-hinged appliance doors, when in the open position, shall not be required to comply with Section 11B-309.3.

**11B-804.6.3 Dishwasher.** Clear floor or ground space shall be positioned adjacent to the dishwasher door. The dishwasher door, in the open position, shall not obstruct the clear floor or ground space for the dishwasher or the sink.

**11B-804.6.4 Range or cooktop.** Where a forward approach is provided, the clear floor or ground space shall provide knee and toe clearance complying with Section 11B-306. Where knee and toe space is provided, the underside of the range or cooktop shall be insulated or otherwise configured to prevent burns, abrasions, or electrical shock. The location of controls shall not require reaching across burners.

**11B-804.6.5 Oven.** Ovens shall comply with Section 11B-804.6.5.

**11B-804.6.5.1 Side-hinged door ovens.** Side-hinged door ovens shall have the work surface required by Section 11B-804.3 positioned adjacent to the latch side of the oven door.

**11B-804.6.5.2 Bottom-hinged door ovens.** Bottom-hinged door ovens shall have the work surface required by Section 11B-804.3 positioned adjacent to one side of the door.

**11B-804.6.5.3 Controls.** Ovens shall have controls on front panels.

**11B-804.6.6 Refrigerator/freezer.** Combination refrigerators and freezers shall have at least 50 percent of the freezer space 54 inches (1372 mm) maximum above the finish floor or ground. The clear floor or ground space shall be positioned for a parallel approach to the space dedicated to a refrigerator/freezer with the centerline of the clear floor or ground space offset 24 inches (610 mm) maximum from the centerline of the dedicated space.

## 11B-805 Medical care and long-term care facilities

**11B-805.1 General.** Medical care facilities and long-term care facilities shall comply with Section 11B-805. All common use spaces and public use spaces in medical care facil-

ties and long-term care facilities shall comply with this chapter.

**11B-805.2 Patient bedrooms and resident sleeping rooms.** Patient bedrooms and resident sleeping rooms required to provide mobility features shall comply with Section 11B-805.2.

**11B-805.2.1 Hand washing fixtures.** Hand washing fixtures shall comply with Section 11B-606.

**11B-805.2.2 Beds.** A 36 inch (914 mm) minimum wide clear space shall be provided along the full length of each side of the beds.

**11B-805.2.3 Turning space.** Turning space complying with Section 11B-304 shall be provided within the room.

**11B-805.2.4 Toilet and bathing rooms.** Toilet and bathing rooms that are provided as part of patient bedrooms and resident sleeping rooms complying with Section 11B-223.2 or 11B-223.3 shall comply with Section 11B-603. Where provided, one water closet, one lavatory, and one bathtub or shower shall comply with the applicable requirements of Sections 11B-603 through 11B-610.

**11B-805.3 Waiting rooms.** Waiting rooms shall comply with Section 11B-805.3.

**11B-805.3.1 Wheelchair spaces.** Where seating is provided in waiting rooms, at least 5 percent of the seating shall be wheelchair spaces complying with Section 11B-802.1.

**Exception:** In waiting rooms serving facilities specializing in treating conditions that affect mobility, 10 percent of the seating shall be wheelchair spaces complying with Section 11B-802.1.

**11B-805.4 Examination, diagnostic and treatment rooms.** Examination, diagnostic and treatment rooms shall comply with Section 11B-805.4.

**11B-805.4.1 Beds, exam tables, procedure tables, gurneys and lounge chairs.** A 36-inch (914 mm) minimum wide clear space shall be provided along the full length of each side of beds, exam tables, procedure tables, gurneys and lounge chairs.

**Exception:** General exam rooms in non-emergency settings may provide clear space on only one side of beds, gurneys and exam tables.

**11B-805.4.2 Equipment.** Clear space complying with Section 11B-305.2 shall be provided as required for specific equipment.

**11B-805.4.3 Turning space.** Turning space complying with Section 11B-304 shall be provided within the room.

**11B-805.5 Patient change areas.** Areas where patients change or are prepared for a procedure shall comply with Section 11B-222.

**11B-805.6 Hand washing fixtures, lavatories and sinks.** All hand washing fixtures, lavatories and sinks shall comply with Section 11B-606.

**Exception:** Scrub sinks, as defined in California Plumbing Code Section 221.0, shall not be required to comply with Section 11B-606.

**11B-805.7 Built-in cabinets and work surfaces.** Built-in cabinets, counters and work surfaces shall be accessible, including: patient wardrobes, nurse's stations, administrative centers, reception desks, medicine preparation areas, laboratory work stations, equipment consoles, clean and soiled utility cabinets, and storage areas; and shall comply with Sections 11B-225 and 11B-902.

**Exceptions:**

1. Built-in wardrobes in patient bedrooms and resident sleeping rooms not required to be accessible are not required to comply with the provisions of this chapter.
2. Clinical laboratory work stations provided in a laboratory area that are in addition to the minimum number required to be accessible (5 percent of the work stations provided, but no fewer than one), are not required to comply with the provisions of Section 11B-902.

**11B-806 Transient lodging guest rooms**

**11B-806.1 General.** Transient lodging guest rooms shall comply with Section 11B-806. Guest rooms required to provide mobility features shall comply with Section 11B-806.2. Guest rooms required to provide communication features shall comply with Section 11B-806.3.

**11B-806.2 Guest rooms with mobility features.** Guest rooms required to provide mobility features shall comply with Section 11B-806.2.

**11B-806.2.1 Living and dining areas.** Living and dining areas shall be accessible.

**11B-806.2.2 Exterior spaces.** Exterior spaces, including patios, terraces and balconies, that serve the guest room shall be accessible.

**11B-806.2.3 Sleeping areas.** At least one sleeping area shall provide a 36 inch (914 mm) by 48 inch (1219 mm) minimum clear space on both sides of a bed. The clear space shall be positioned for parallel approach to the side of the bed.

**Exception:** Where a single clear floor space complying with Section 11B-305 positioned for parallel approach is provided between two beds, a clear floor or ground space shall not be required on both sides of a bed.

**11B-806.2.3.1 Personal lift device floor space.** There shall be a clear space under the bed for the use of a personal lift device. The clear space shall extend under the bed parallel to the long side and be adjacent to an accessible route. The clear space shall extend to points horizontally 30 inches (762 mm), vertically 7 inches (178 mm) and not more than 12 inches (305 mm) from the head and foot end of the bed.

**11B-806.2.4 Toilet and bathing facilities.** At least one bathroom that is provided as part of a guest room shall comply with Section 11B-603. No fewer than one water closet, one lavatory, and one bathtub or shower shall comply with applicable requirements of Sections 11B-603 through 11B-610. In addition, required roll-in shower compartments shall comply with Section 11B-608.2.2 or 11B-608.2.3. Toilet and bathing fixtures required to com-

ply with Sections 11B-603 through 11B-610 shall be permitted to be located in more than one toilet or bathing area, provided that travel between fixtures does not require travel between other parts of the guest room.

**11B-806.2.4.1 Vanity counter top space.** If vanity counter top space is provided in non-accessible guest toilet or bathing rooms, comparable vanity counter top space, in terms of size and proximity to the lavatory, shall also be provided in accessible guest toilet or bathing rooms.

**11B-806.2.5 Kitchens, kitchenettes and wet bars.** Kitchens, kitchenettes and wet bars shall comply with Section 11B-804.

**11B-806.2.6 Turning space.** Turning space complying with Section 11B-304 shall be provided within the guest room.

**11B-806.3 Guest rooms with communication features.** Guest rooms required to provide communication features shall comply with Section 11B-806.3.

**11B-806.3.1 Alarms.** Where emergency warning systems are provided, fire alarms shall comply with Section 11B-702 and carbon monoxide alarms shall comply with Chapter 4.

**11B-806.3.2 Notification devices.** Visible notification devices shall be provided to alert room occupants of incoming telephone calls and a door knock or bell. Notification devices shall not be connected to visible alarm signal appliances. Telephones shall have volume controls compatible with the telephone system and shall comply with Section 11B-704.3. Telephones shall be served by an electrical outlet complying with Section 11B-309 located within 48 inches (1219 mm) of the telephone to facilitate the use of a TTY.

**11B-807 Holding cells and housing cells**

**11B-807.1 General.** Holding cells and housing cells shall comply with Section 11B-807.

**11B-807.2 Cells with mobility features.** Cells required to provide mobility features shall comply with Section 11B-807.2.

**11B-807.2.1 Turning space.** Turning space complying with Section 11B-304 shall be provided within the cell.

**11B-807.2.2 Benches.** Where benches are provided, at least one bench shall comply with Section 11B-903.

**11B-807.2.3 Beds.** Where beds are provided, clear floor space complying with Section 11B-305 shall be provided on at least one side of the bed. The clear floor space shall be positioned for parallel approach to the side of the bed.

**11B-807.2.4 Toilet and bathing facilities.** Toilet facilities or bathing facilities that are provided as part of a cell shall comply with Section 11B-603. Where provided, no fewer than one water closet, one lavatory, and one bathtub or shower shall comply with the applicable requirements of Sections 11B-603 through 11B-610.

**11B-807.3 Cells with communication features.** Cells required to provide communication features shall comply with Section 11B-807.3.

**11B-807.3.1 Alarms.** Where audible emergency alarm systems are provided to serve the occupants of cells, visible alarms complying with *Section 11B-702* shall be provided.

**Exception:** Visible alarms shall not be required where inmates or detainees are not allowed independent means of egress.

**11B-807.3.2 Telephones.** Telephones, where provided within cells, shall have volume controls complying with *Section 11B-704.3*.

## 11B-808 Courtrooms

**11B-808.1 General.** Courtrooms shall comply with *Section 11B-808*.

**11B-808.2 Turning space.** Where provided, areas that are raised or depressed and accessed by ramps or platform lifts with entry ramps shall provide unobstructed turning space complying with *Section 11B-304*.

**11B-808.3 Clear floor space.** Each jury box and witness stand shall have, within its defined area, clear floor space complying with *Section 11B-305*.

**Exception:** In alterations, wheelchair spaces are not required to be located within the defined area of raised jury boxes or witness stands and shall be permitted to be located outside these spaces where ramp or platform lift access poses a hazard by restricting or projecting into a means of egress required by the appropriate administrative authority.

**11B-808.4 Judges' benches and courtroom stations.** Judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations, court reporters' stations and litigants' and counsel stations shall comply with *Section 11B-902*.

## 11B-809 Residential dwelling units

**11B-809.1 General.** When located within public housing facilities, residential dwelling units shall comply with *Section 11B-809*. Residential dwelling units required to provide mobility features shall comply with *Sections 11B-809.2 through 11B-809.4*. Residential dwelling units required to provide communication features shall comply with *Section 11B-809.5*.

**11B-809.2 Accessible routes.** Accessible routes complying with *Division 4* shall be provided within residential dwelling units in accordance with *Section 11B-809.2*.

**Exception:** Accessible routes shall not be required to or within unfinished attics or unfinished basements.

**11B-809.2.1 Location.** At least one accessible route shall connect all spaces and elements which are a part of the residential dwelling unit. Where only one accessible route is provided, it shall not pass through bathrooms, closets, or similar spaces.

**11B-809.2.2 Turning space.** All rooms served by an accessible route shall provide a turning space complying with *Section 11B-304*.

**Exception:** Turning space shall not be required in exterior spaces 30 inches (762 mm) maximum in depth or width.

**11B-809.3 Kitchen.** Where a kitchen is provided, it shall comply with *Section 11B-804*.

**11B-809.4 Toilet facilities and bathing facilities.** At least one bathroom shall comply with *Section 11B-603*. No fewer than one of each type of fixture provided within the bathroom shall comply with applicable requirements of *Sections 11B-603 through 11B-610*. Toilet and bathing fixtures required to comply with *Sections 11B-603 through 11B-610* shall be located in the same bathroom or toilet and bathing area, such that travel between fixtures does not require travel between other parts of the residential dwelling unit.

**11B-809.4.1 Subsequent bathrooms.** In residential dwelling units with more than one bathroom, when a bathtub is installed in the first bathroom in compliance with *Section 11B-809.4* and a shower compartment is provided in a subsequent bathroom, at least one shower compartment shall comply with *Section 11B-608*.

**11B-809.5 Residential dwelling units with communication features.** Residential dwelling units required to provide communication features shall comply with *Section 11B-809.5*.

**11B-809.5.1 Building fire alarm system.** Where a building fire alarm system is provided, the system wiring shall be extended to a point within the residential dwelling unit in the vicinity of the residential dwelling unit smoke detection system.

**11B-809.5.1.1 Alarm appliances.** Where alarm appliances are provided within a residential dwelling unit as part of the building fire alarm system, they shall comply with *Chapter 9, Section 907.5.2.3.4*.

**11B-809.5.1.2 Activation.** All visible alarm appliances provided within the residential dwelling unit for building fire alarm notification shall be activated upon activation of the building fire alarm in the portion of the building containing the residential dwelling unit.

**11B-809.5.2 Residential dwelling unit smoke detection system and carbon monoxide detection system.** Residential dwelling unit smoke detection systems shall comply with *Chapter 9, Section 907.2.11*. Residential dwelling unit carbon monoxide detection systems shall comply with *Chapter 4*.

**11B-809.5.2.1 Activation.** All visible alarm appliances provided within the residential dwelling unit for smoke detection notification shall be activated upon smoke detection. All visible alarm appliances provided within the residential dwelling unit for carbon monoxide detection notification shall be activated upon carbon monoxide detection.

**11B-809.5.3 Interconnection.** The same visible alarm appliances shall be permitted to provide notification of residential dwelling unit smoke detection, building fire alarm activation, and carbon monoxide detection.

**11B-809.5.4 Prohibited use.** Visible alarm appliances used to indicate residential dwelling unit smoke detection, carbon monoxide detection, or building fire alarm activation shall not be used for any other purpose within the residential dwelling unit.

**11B-809.5.5 Residential dwelling unit primary entrance.** Communication features shall be provided at the residential dwelling unit primary entrance complying with *Section 11B-809.5.5*.

**11B-809.5.5.1 Notification.** A hard-wired electric doorbell shall be provided. A button or switch shall be provided outside the residential dwelling unit primary entrance. Activation of the button or switch shall initiate an audible tone and visible signal within the residential dwelling unit. Where visible doorbell signals are located in sleeping areas, they shall have controls to deactivate the signal.

**11B-809.5.5.2 Identification.** A means for visually identifying a visitor without opening the residential dwelling unit entry door shall be provided and shall allow for a minimum 180 degree range of view.

**11B-809.5.6 Site, building, or floor entrance.** Where a system, including a closed-circuit system, permitting voice communication between a visitor and the occupant of the residential dwelling unit is provided, the system shall comply with Section 11B-708.4.

## 11B-810 Transportation facilities

**11B-810.1 General.** Transportation facilities shall comply with Section 11B-810.

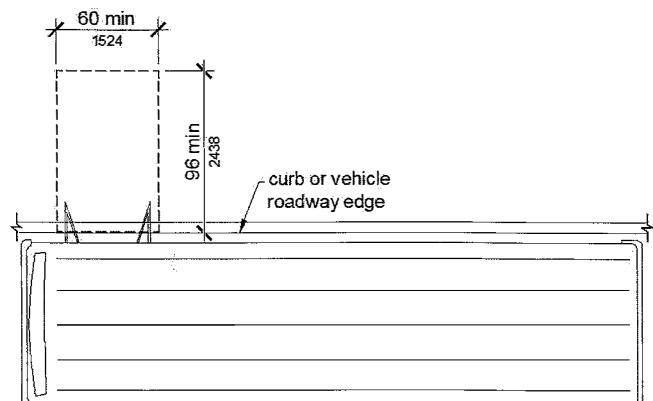
**11B-810.1.1 Vehicle boarding.** Stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.

**11B-810.1.2 Baggage systems.** Baggage check-in and retrieval systems shall be on an accessible route complying with Section 11B-402 and shall have space immediately adjacent complying with Section 11B-302.

**11B-810.2 Bus boarding and alighting areas.** Bus boarding and alighting areas shall comply with Section 11B-810.2.

**11B-810.2.1 Surface.** Bus stop boarding and alighting areas shall have a firm, stable surface.

**11B-810.2.2 Dimensions.** Bus stop boarding and alighting areas shall provide a clear length of 96 inches (2438 mm) minimum, measured perpendicular to the curb or vehicle roadway edge, and a clear width of 60 inches (1524 mm) minimum, measured parallel to the vehicle roadway.

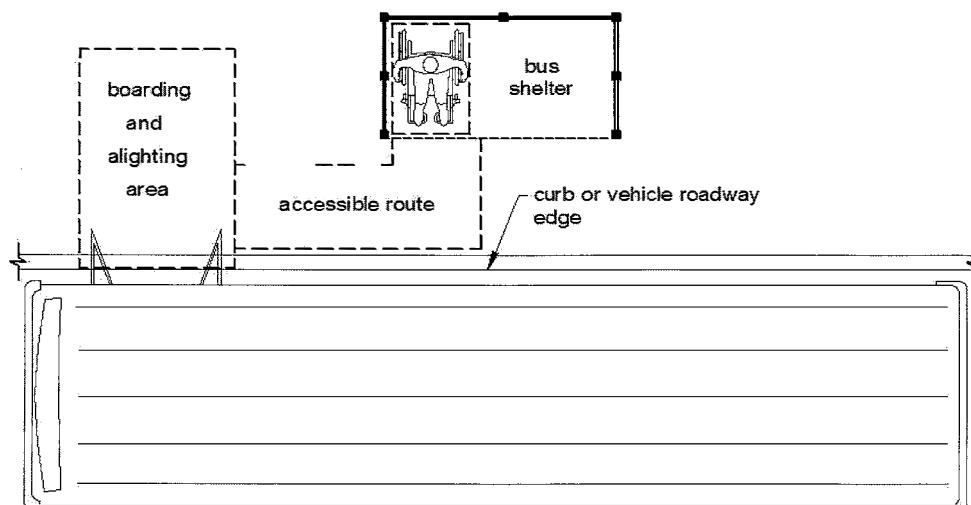


**FIGURE 11B-810.2.2  
DIMENSIONS OF BUS BOARDING AND ALIGHTING AREAS**

**11B-810.2.3 Connection.** Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with Section 11B-402. Newly constructed bus stop boarding and alighting areas shall provide a detectable transition between the boarding/alighting area and the roadway; the detectable transition shall consist of a curb with the face sloped at 35 degrees maximum from vertical or detectable warnings complying with Sections 11B-705.1.1 and 11B-705.1.2.4.

**11B-810.2.4 Slope.** Parallel to the roadway, the slope of the bus stop boarding and alighting area shall be the same as the roadway, to the maximum extent practicable. Perpendicular to the roadway, the slope of the bus stop boarding and alighting area shall not be steeper than 1:48.

**11B-810.3 Bus shelters.** Bus shelters shall provide a minimum clear floor or ground space complying with Section 11B-305 entirely within the shelter. Bus shelters shall be connected by an accessible route complying with Section 11B-402 to a boarding and alighting area complying with Section 11B-810.2.



**FIGURE 11B-810.3  
BUS SHELTERS**

**11B-810.4 Bus signs.** Bus route identification signs shall comply with *Sections 11B-703.5.1 through 11B-703.5.4*, and *Sections 11B-703.5.7 and 11B-703.5.8*. In addition, to the maximum extent practicable, bus route identification signs shall comply with *Section 11B-703.5.5*.

**Exception:** Bus schedules, timetables and maps that are posted at the bus stop or bus bay shall not be required to comply.

**11B-810.5 Rail platforms.** Rail platforms shall comply with *Section 11B-810.5*.

**11B-810.5.1 Slope.** Rail platforms shall not exceed a slope of 1:48 in all directions.

**Exception:** Where platforms serve vehicles operating on existing track or track laid in existing roadway, the slope of the platform parallel to the track shall be permitted to be equal to the slope (grade) of the roadway or existing track.

**11B-810.5.2 Detectable warnings.** Platform boarding edges not protected by platform screens or guards shall have detectable warnings complying with *Section 11B-705* along the full length of the public use area of the platform.

**11B-810.5.3 Platform and vehicle floor coordination.** Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements of 36 CFR Part 1192. Low-level platforms shall be 8 inches (203 mm) minimum above top of rail.

**Exception:** Where vehicles are boarded from sidewalks or street-level, low-level platforms shall be permitted to be less than 8 inches (203 mm).

**11B-810.6 Rail station signs.** Rail station signs shall comply with *Section 11B-810.6*.

**Exception:** Signs shall not be required to comply with *Sections 11B-810.6.1 and 11B-810.6.2* where audible signs are remotely transmitted to hand-held receivers, or are user- or proximity-actuated.

**11B-810.6.1 Entrances.** Where signs identify a station or its entrance, at least one sign at each entrance shall comply with *Section 11B-703.2* and shall be placed in uniform locations to the maximum extent practicable. Where signs identify a station that has no defined entrance, at least one sign shall comply with *Section 11B-703.2* and shall be placed in a central location.

**11B-810.6.2 Routes and destinations.** Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or mezzanines shall comply with *Section 11B-703.5*. At least one tactile sign identifying the specific station and complying with *Section 11B-703.2* shall be provided on each platform or boarding area. Signs covered by this requirement shall, to the maximum extent practicable, be placed in uniform locations within the system.

**Exception:** Where sign space is limited, characters shall not be required to exceed 3 inches (76 mm).

**11B-810.6.3 Station names.** Stations covered by this section shall have identification signs complying with *Section 11B-703.5*. Signs shall be clearly visible and within the

sight lines of standing and sitting passengers from within the vehicle on both sides when not obstructed by another vehicle.

**11B-810.7 Public address systems.** Where public address systems convey audible information to the public, the same or equivalent information shall be provided in a visual format.

**11B-810.8 Clocks.** Where clocks are provided for use by the public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are installed overhead, numerals and digits shall comply with *Section 11B-703.5*.

**11B-810.9 Escalators.** Where provided, escalators shall comply with Sections 6.1.3.5.6 and 6.1.3.6.5 of ASME A17.1 and shall have a clear width of 32 inches (813 mm) minimum.

**Exception:** Existing escalators in key stations shall not be required to comply with *Section 11B-810.9*.

**11B-810.10 Track crossings.** Where a circulation path serving boarding platforms crosses tracks, it shall comply with *Section 11B-402*.

**Exception:** Openings for wheel flanges shall be permitted to be  $2\frac{1}{2}$  inches (64 mm) maximum.



FIGURE 11B-810.10 (EXCEPTION)  
TRACK CROSSINGS

## 11B-811 Storage

**11B-811.1 General.** Storage shall comply with *Section 11B-811*.

**11B-811.2 Clear floor or ground space.** A clear floor or ground space complying with *Section 11B-305* shall be provided.

**11B-811.3 Height.** Storage elements shall comply with at least one of the reach ranges specified in *Section 11B-308*.

**11B-811.4 Operable parts.** Operable parts shall comply with *Section 11B-309*.

## DIVISION 9: BUILT-IN ELEMENTS

### **11B-901 General**

**11B-901.1 Scope.** The provisions of *Division 9* shall apply where required by *Division 2* or where referenced by a requirement in this *chapter*.

### **11B-902 Dining surfaces and work surfaces**

**11B-902.1 General.** Dining surfaces and work surfaces shall comply with *Sections 11B-902.2* and *11B-902.3*.

**Exception:** Dining surfaces and work surfaces for children's use shall be permitted to comply with *Section 11B-902.4*.

**11B-902.2 Clear floor or ground space.** A clear floor space complying with *Section 11B-305* positioned for a forward approach shall be provided. Knee and toe clearance complying with *Section 11B-306* shall be provided.

**11B-902.3 Height.** The tops of dining surfaces and work surfaces shall be 28 inches (711 mm) minimum and 34 inches (864 mm) maximum above the finish floor or ground.

**11B-902.4 Dining surfaces and work surfaces for children's use.** Accessible dining surfaces and work surfaces for children's use shall comply with *Section 11B-902.4*.

**Exception:** Dining surfaces and work surfaces that are used primarily by children 5 years and younger shall not be required to comply with *Section 11B-902.4* where a clear floor or ground space complying with *Section 11B-305* positioned for a parallel approach is provided.

**11B-902.4.1 Clear floor or ground space.** A clear floor space complying with *Section 11B-305* positioned for forward approach shall be provided. Knee and toe clearance complying with *Section 11B-306* shall be provided, except that knee clearance 24 inches (610 mm) minimum above the finish floor or ground shall be permitted.

**11B-902.4.2 Height.** The tops of tables and counters shall be 26 inches (660 mm) minimum and 30 inches (762 mm) maximum above the finish floor or ground.

### **11B-903 Benches**

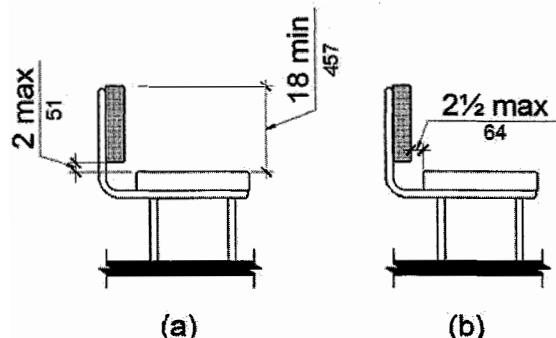
**11B-903.1 General.** Benches shall comply with *Section 11B-903*.

**11B-903.2 Clear floor or ground space.** Clear floor or ground space complying with *Section 11B-305* shall be provided and shall be positioned at the end of the bench seat and parallel to the short axis of the bench.

**11B-903.3 Size.** Benches shall have seats that are 48 inches (1219 mm) long minimum and 20 inches (508 mm) deep minimum and 24 inches (610 mm) deep maximum.

**11B-903.4 Back support.** The bench shall provide for back support or shall be affixed to a wall *along its long dimension*.

Back support shall be 48 inches (1219 mm) long minimum and shall extend from a point 2 inches (51 mm) maximum above the seat surface to a point 18 inches (457 mm) minimum above the seat surface. Back support shall be  $2\frac{1}{2}$  inches (64 mm) maximum from the rear edge of the seat measured horizontally.



**FIGURE 11B-903.4  
BENCH BACK SUPPORT**

**11B-903.5 Height.** The top of the bench seat surface shall be 17 inches (432 mm) minimum and 19 inches (483 mm) maximum above the finish floor or ground.

**11B-903.6 Structural strength.** *Benches shall be affixed to the wall or floor.* Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

**11B-903.7 Wet locations.** Where installed in wet locations, the surface of the seat shall be slip resistant and shall not accumulate water.

### **11B-904 Check-out aisles and sales and service counters**

**11B-904.1 General.** Check-out aisles and sales and service counters shall comply with the applicable requirements of *Section 11B-904*.

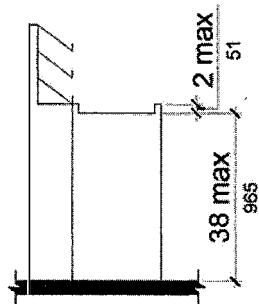
**11B-904.2 Approach.** All portions of counters required to comply with *Section 11B-904* shall be located adjacent to a walking surface complying with *Section 11B-403*.

**11B-904.3 Check-out aisles.** Check-out aisles shall comply with *Section 11B-904.3*.

**11B-904.3.1 Aisle.** Aisles shall comply with *Section 11B-403*.

**11B-904.3.2 Counter.** The counter surface height shall be 38 inches (965 mm) maximum above the finish floor or ground. The top of the counter edge protection shall be 2

inches (51 mm) maximum above the top of the counter surface on the aisle side of the check-out counter.



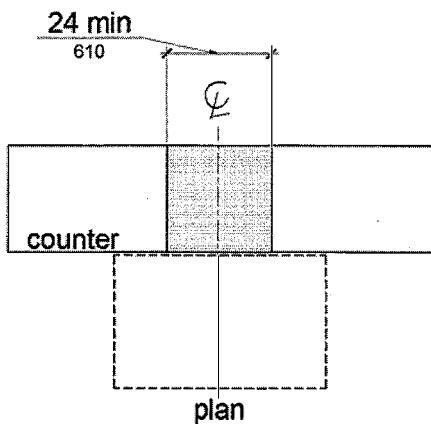
**FIGURE 11B-904.3.2  
CHECK-OUT AISLE COUNTERS**

**11B-904.3.3 Check writing surfaces.** Where provided, check writing surfaces shall comply with *Section 11B-902.3*.

**11B-904.3.4 Identification sign.** When not all check-out aisles are accessible, accessible check-out aisles shall be identified by a sign clearly visible to a person in a wheelchair displaying the International Symbol of Accessibility complying with *Section 11B-703.7.2.1*. The sign shall be a minimum of 4 inches by 4 inches (102 mm by 102 mm).

**11B-904.4 Sales and service counters.** Sales counters and service counters shall comply with *Section 11B-904.4.1* or *11B-904.4.2*. The accessible portion of the counter top shall extend the same depth as the sales or service counter top.

**Exception:** In alterations, when the provision of a counter complying with *Section 11B-904.4* would result in a reduction of the number of existing counters at work stations or a reduction of the number of existing mail boxes, the counter shall be permitted to have a portion which is 24 inches (610 mm) long minimum complying with *Section 11B-904.4.1* provided that the required clear floor or ground space is centered on the accessible length of the counter.



**FIGURE 11B-904.4 (EXCEPTION)  
ALTERATION OF SALES AND SERVICE COUNTERS**

**11B-904.4.1 Parallel approach.** A portion of the counter surface that is 36 inches (914 mm) long minimum and 34 inches (864 mm) high maximum above the finish floor shall be provided. A clear floor or ground space complying with *Section 11B-305* shall be positioned for a parallel approach adjacent to the 36 inch (914 mm) minimum length of counter.

**Exception:** Where the provided counter surface is less than 36 inches (914 mm) long, the entire counter surface shall be 34 inches (864 mm) high maximum above the finish floor.

**11B-904.4.2 Forward approach.** A portion of the counter surface that is 36 inches (914 mm) long minimum and 34 inches (864 mm) high maximum shall be provided. Knee and toe space complying with *Section 11B-306* shall be provided under the counter. A clear floor or ground space complying with *Section 11B-305* shall be positioned for a forward approach to the counter.

**11B-904.5 Food service lines.** Counters in food service lines shall comply with *Section 11B-904.5*.

**11B-904.5.1 Self-service shelves and dispensing devices.** Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall comply with *Section 11B-308*.

**11B-904.5.2 Tray slides.** The tops of tray slides shall be 28 inches (711 mm) minimum and 34 inches (864 mm) maximum above the finish floor or ground.

**11B-904.6 Security glazing.** Where counters or teller windows have security glazing to separate personnel from the public, a method to facilitate voice communication shall be provided. Telephone handset devices, if provided, shall comply with *Section 11B-704.3*.

## DIVISION 10:

### RECREATION FACILITIES

#### **11B-1001 General**

**11B-1001.1 Scope.** The provisions of *Division 10* shall apply where required by *Division 2* or where referenced by a requirement in this chapter.

#### **11B-1002 Amusement rides**

**11B-1002.1 General.** Amusement rides shall comply with *Section 11B-1002*.

**11B-1002.2 Accessible routes.** Accessible routes serving amusement rides shall comply with *Division 4*.

#### **Exceptions:**

1. In load or unload areas and on amusement rides, where compliance with *Section 11B-405.2* is not structurally or operationally feasible, ramp slope shall be permitted to be 1:8 maximum.
2. In load or unload areas and on amusement rides, handrails provided along walking surfaces complying with *Section 11B-403* and required on ramps complying with *Section 11B-405* shall not be required to comply with *Section 11B-505* where compliance is not structurally or operationally feasible.

**11B-1002.3 Load and unload areas.** A turning space complying with *Sections 11B-304.2* and *11B-304.3* shall be provided in load and unload areas.

**11B-1002.4 Wheelchair spaces in amusement rides.** Wheelchair spaces in amusement rides shall comply with *Section 11B-1002.4*.

**11B-1002.4.1 Floor or ground surface.** The floor or ground surface of wheelchair spaces shall be stable and firm.

**11B-1002.4.2 Slope.** The floor or ground surface of wheelchair spaces shall have a slope not steeper than 1:48 when in the load and unload position.

**11B-1002.4.3 Gaps.** Floors of amusement rides with wheelchair spaces and floors of load and unload areas shall be coordinated so that, when amusement rides are at rest in the load and unload position, the vertical difference between the floors shall be within plus or minus  $\frac{5}{8}$  inches (15.9 mm) and the horizontal gap shall be 3 inches (76 mm) maximum under normal passenger load conditions.

**Exception:** Where compliance is not operationally or structurally feasible, ramps, bridge plates, or similar devices complying with the applicable requirements of 36 CFR 1192.83(c) shall be provided.

**11B-1002.4.4 Clearances.** Clearances for wheelchair spaces shall comply with *Section 11B-1002.4.4*.

#### **Exceptions:**

1. Where provided, securement devices shall be permitted to overlap required clearances.

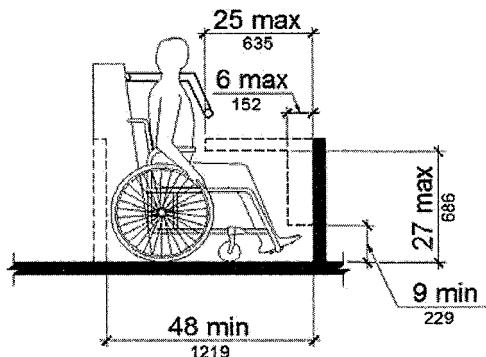
2. Wheelchair spaces shall be permitted to be mechanically or manually repositioned.

3. Wheelchair spaces shall not be required to comply with *Section 11B-307.4*.

**11B-1002.4.4.1 Width and length.** Wheelchair spaces shall provide a clear width of 30 inches (762 mm) minimum and a clear length of 48 inches (1219 mm) minimum measured to 9 inches (229 mm) minimum above the floor surface.

**11B-1002.4.4.2 Side entry.** Where wheelchair spaces are entered only from the side, amusement rides shall be designed to permit sufficient maneuvering clearance for individuals using a wheelchair or mobility aid to enter and exit the ride.

**11B-1002.4.4.3 Permitted protrusions in wheelchair spaces.** Objects are permitted to protrude a distance of 6 inches (152 mm) maximum along the front of the wheelchair space, where located 9 inches (229 mm) minimum and 27 inches (686 mm) maximum above the floor or ground surface of the wheelchair space. Objects are permitted to protrude a distance of 25 inches (635 mm) maximum along the front of the wheelchair space, where located more than 27 inches (686 mm) above the floor or ground surface of the wheelchair space.



**FIGURE 11B-1002.4.4.3  
PROTRUSIONS IN WHEELCHAIR  
SPACES IN AMUSEMENT RIDES**

**11B-1002.4.5 Ride entry.** Openings providing entry to wheelchair spaces on amusement rides shall be 32 inches (813 mm) minimum clear.

**11B-1002.4.6 Approach.** One side of the wheelchair space shall adjoin an accessible route when in the load and unload position.

**11B-1002.4.7 Companion seats.** Where the interior width of the amusement ride is greater than 53 inches (1346 mm), seating is provided for more than one rider, and the wheelchair is not required to be centered within the

amusement ride, a companion seat shall be provided for each wheelchair space.

**11B-1002.4.7.1 Shoulder-to-shoulder seating.** Where an amusement ride provides shoulder-to-shoulder seating, companion seats shall be shoulder-to-shoulder with the adjacent wheelchair space.

**Exception:** Where shoulder-to-shoulder companion seating is not operationally or structurally feasible, compliance with this requirement shall be required to the maximum extent practicable.

**11B-1002.5 Amusement ride seats designed for transfer.** Amusement ride seats designed for transfer shall comply with *Section 11B-1002.5* when positioned for loading and unloading.

**11B-1002.5.1 Clear floor or ground space.** A clear floor or ground space complying with *Section 11B-305* shall be provided in the load and unload area adjacent to the amusement ride seats designed for transfer.

**11B-1002.5.2 Transfer height.** The height of amusement ride seats designed for transfer shall be 14 inches (356 mm) minimum and 24 inches (610 mm) maximum measured from the surface of the load and unload area.

**11B-1002.5.3 Transfer entry.** Where openings are provided for transfer to amusement ride seats, the openings shall provide clearance for transfer from a wheelchair or mobility aid to the amusement ride seat.

**11B-1002.5.4 Wheelchair storage space.** Wheelchair storage spaces complying with *Section 11B-305* shall be provided in or adjacent to unload areas for each required amusement ride seat designed for transfer and shall not overlap any required means of egress or accessible route.

**11B-1002.6 Transfer devices for use with amusement rides.** Transfer devices for use with amusement rides shall comply with *Section 11B-1002.6* when positioned for loading and unloading.

**11B-1002.6.1 Clear floor or ground space.** A clear floor or ground space complying with *Section 11B-305* shall be provided in the load and unload area adjacent to the transfer device.

**11B-1002.6.2 Transfer height.** The height of transfer device seats shall be 14 inches (356 mm) minimum and 24 inches (610 mm) maximum measured from the load and unload surface.

**11B-1002.6.3 Wheelchair storage space.** Wheelchair storage spaces complying with *Section 11B-305* shall be provided in or adjacent to unload areas for each required transfer device and shall not overlap any required means of egress or accessible route.

### 11B-1003 Recreational boating facilities

**11B-1003.1 General.** Recreational boating facilities shall comply with *Section 11B-1003*.

**11B-1003.2 Accessible routes.** Accessible routes serving recreational boating facilities, including gangways and floating piers, shall comply with *Division 4* except as modified by the exceptions in *Section 11B-1003.2*.

**11B-1003.2.1 Boat slips.** Accessible routes serving boat slips shall be permitted to use the exceptions in *Section 11B-1003.2.1*.

#### Exceptions:

- Where an existing gangway or series of gangways is replaced or altered, an increase in the length of the gangway shall not be required to comply with *Section 11B-1003.2* unless required by *Section 11B-202.4*.
- Gangways shall not be required to comply with the maximum rise specified in *Section 11B-405.6*.
- Where the total length of a gangway or series of gangways serving as part of a required accessible route is 80 feet (24384 mm) minimum, gangways shall not be required to comply with *Section 11B-405.2*.
- Where facilities contain fewer than 25 boat slips and the total length of the gangway or series of gangways serving as part of a required accessible route is 30 feet (9144 mm) minimum, gangways shall not be required to comply with *Section 11B-405.2*.
- Where gangways connect to transition plates, landings specified by *Section 11B-405.7* shall not be required.
- Where gangways and transition plates connect and are required to have handrails, handrail extensions shall not be required. Where handrail extensions are provided on gangways or transition plates, the handrail extensions shall not be required to be parallel with the ground or floor surface.
- The cross slope specified in *Sections 11B-403.3* and *11B-405.3* for gangways, transition plates, and floating piers that are part of accessible routes shall be measured in the static position.
- Changes in level complying with *Sections 11B-303.3* and *11B-303.4* shall be permitted on the surfaces of gangways and boat launch ramps.

**11B-1003.2.2 Boarding piers at boat launch ramps.** Accessible routes serving boarding piers at boat launch ramps shall be permitted to use the exceptions in *Section 11B-1003.2.2*.

#### Exceptions:

- Accessible routes serving floating boarding piers shall be permitted to use Exceptions 1, 2, 5, 6, 7 and 8 in *Section 11B-1003.2.1*.
- Where the total length of the gangway or series of gangways serving as part of a required accessible route is 30 feet (9144 mm) minimum, gangways shall not be required to comply with *Section 11B-405.2*.
- Where the accessible route serving a floating boarding pier or skid pier is located within a boat launch ramp, the portion of the accessible route

located within the boat launch ramp shall not be required to comply with *Section 11B-405*.

**11B-1003.3 Clearances.** Clearances at boat slips and on boarding piers at boat launch ramps shall comply with *Section 11B-1003.3*.

**11B-1003.3.1 Boat slip clearance.** Boat slips shall provide clear pier space 60 inches (1524 mm) wide minimum and at least as long as the boat slips. Each 10 feet (3048 mm) maximum of linear pier edge serving boat slips shall contain at least one continuous clear opening 60 inches (1524 mm) wide minimum.

**Exceptions:**

1. Clear pier space shall be permitted to be 36 inches (914 mm) wide minimum for a length of 24 inches (610 mm) maximum, provided that multiple 36 inch (914 mm) wide segments are separated by segments that are 60 inches (1524

mm) wide minimum and 60 inches (1524 mm) long minimum.

2. Edge protection shall be permitted at the continuous clear openings, provided that it is 4 inches (102 mm) high maximum and 2 inches (51 mm) wide maximum.
3. In existing piers, clear pier space shall be permitted to be located perpendicular to the boat slip and shall extend the width of the boat slip, where

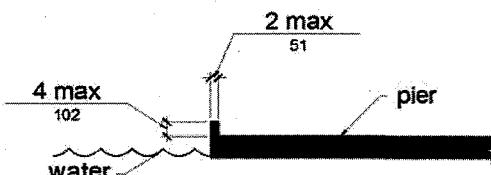


FIGURE 11B-1003.3.1 (EXCEPTION 2)  
EDGE PROTECTION AT BOAT SLIPS

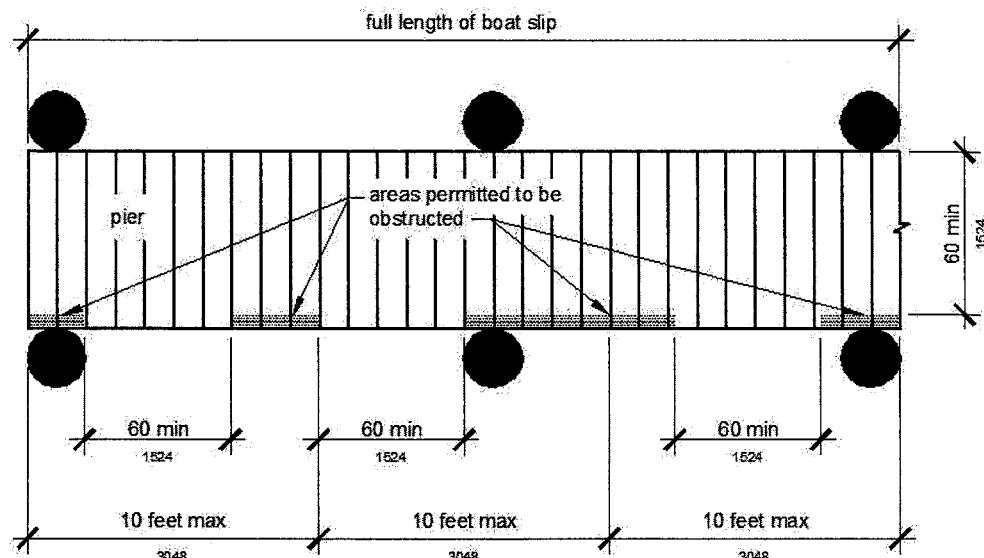


FIGURE 11B-1003.3.1  
BOAT SLIP CLEARANCE

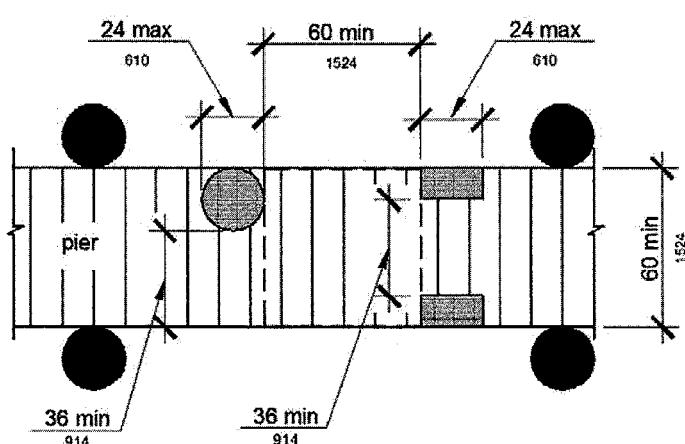


FIGURE 11B-1003.3.1 (EXCEPTION 1)  
CLEAR PIER SPACE REDUCTION AT BOAT SLIPS

the facility has at least one boat slip complying with *Section 11B-1003.3*, and further compliance with *Section 11B-1003.3* would result in a reduction in the number of boat slips available or result in a reduction of the widths of existing slips.

**11B-1003.3.2 Boarding pier clearances.** Boarding piers at boat launch ramps shall provide clear pier space 60 inches (1524 mm) wide minimum and shall extend the full length of the boarding pier. Every 10 feet (3048 mm) maximum of linear pier edge shall contain at least one continuous clear opening 60 inches (1524 mm) wide minimum.

**Exceptions:**

1. The clear pier space shall be permitted to be 36 inches (914 mm) wide minimum for a length of 24 inches (610 mm) maximum provided that multiple 36 inch (914 mm) wide segments are separated by segments that are 60 inches (1524 mm) wide minimum and 60 inches (1524 mm) long minimum.

2. Edge protection shall be permitted at the continuous clear openings provided that it is 4 inches (102 mm) high maximum and 2 inches (51 mm) wide maximum.

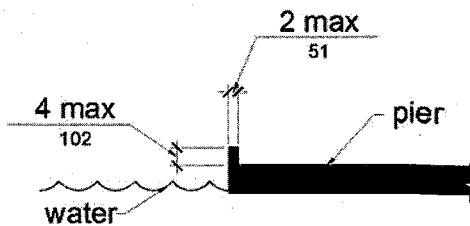


FIGURE 11B-1003.3.2 (EXCEPTION 2)  
EDGE PROTECTION AT BOARDING PIERS

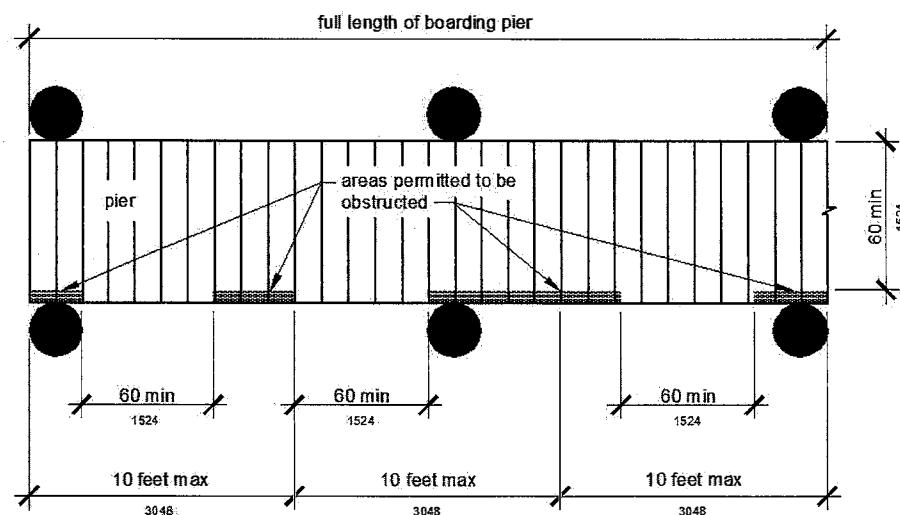


FIGURE 11B-1003.3.2  
BOARDING PIER CLEARANCE

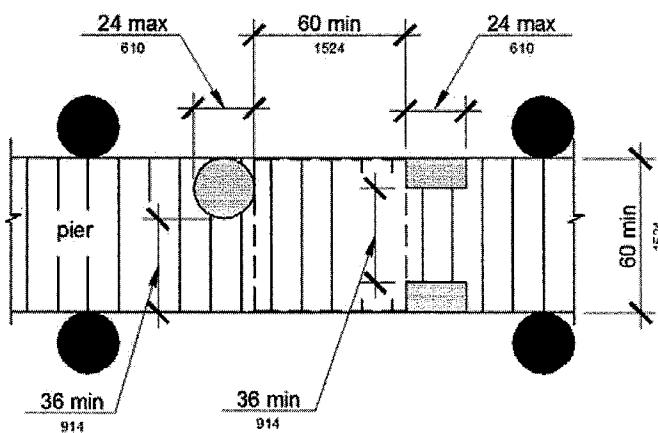


FIGURE 11B-1003.3.2 (EXCEPTION 1)  
CLEAR PIER SPACE REDUCTION AT BOARDING PIERS

**11B-1004 Exercise machines and equipment**

**11B-1004.1 Clear floor space.** Exercise machines and equipment shall have a clear floor space complying with *Section 11B-305* positioned for transfer or for use by an individual seated in a wheelchair. Clear floor or ground spaces required at exercise machines and equipment shall be permitted to overlap.

**11B-1005 Fishing piers and platforms**

**11B-1005.1 Accessible routes.** Accessible routes serving fishing piers and platforms, including gangways and floating piers, shall comply with *Division 4*.

**Exceptions:**

1. Accessible routes serving floating fishing piers and platforms shall be permitted to use Exceptions 1, 2, 5, 6, 7 and 8 in *Section 11B-1003.2.1*.
2. Where the total length of the gangway or series of gangways serving as part of a required accessible route is 30 feet (9144 mm) minimum, gangways shall not be required to comply with *Section 11B-405.2*.

**11B-1005.2 Railings.** Where provided, railings, guards, or handrails shall comply with *Section 11B-1005.2*.

**11B-1005.2.1 Height.** At least 25 percent of the railings, guards, or handrails shall be 34 inches (864 mm) maximum above the ground or deck surface.

**Exception:** Where a guard complying with *Chapter 10, Sections 1013.2 through 1013.4* is provided, the guard shall not be required to comply with *Section 11B-1005.2.1*.

**11B-1005.2.1.1 Dispersion.** Railings, guards, or handrails required to comply with *Section 11B-1005.2.1* shall be dispersed throughout the fishing pier or platform.

**11B-1005.3 Edge protection.** Where railings, guards, or handrails complying with *Section 11B-1005.2* are provided, edge protection complying with *Section 11B-1005.3.1* or *11B-1005.3.2* shall be provided.

**11B-1005.3.1 Curb or barrier.** Curbs or barriers shall extend 2 inches (51 mm) minimum above the surface of the fishing pier or platform.

**11B-1005.3.2 Extended ground or deck surface.** The ground or deck surface shall extend 12 inches (305 mm) minimum beyond the inside face of the railing. Toe clearance shall be provided and shall be 30 inches (762 mm) wide minimum and 9 inches (229 mm) minimum above the ground or deck surface beyond the railing.

**11B-1005.4 Clear floor or ground space.** At each location where there are railings, guards, or handrails complying with *Section 11B-1005.2.1*, a clear floor or ground space complying with *Section 11B-305* shall be provided. Where there are no railings, guards, or handrails, at least one clear floor or ground space complying with *Section 11B-305* shall be provided on the fishing pier or platform.

**11B-1005.5 Turning space.** At least one turning space complying with *Section 11B-304.3* shall be provided on fishing piers and platforms.

**11B-1006 Golf facilities**

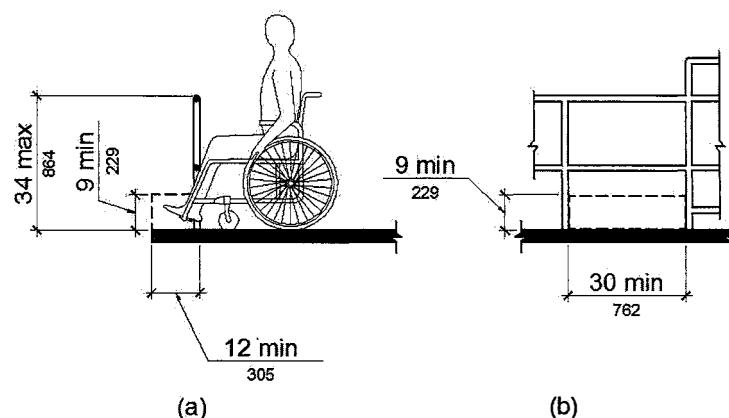
**11B-1006.1 General.** Golf facilities shall comply with *Section 11B-1006*.

**11B-1006.2 Accessible routes.** Accessible routes serving teeing grounds, practice teeing grounds, putting greens, practice putting greens, teeing stations at driving ranges, course weather shelters, golf car rental areas, bag drop areas, and course toilet rooms shall comply with *Division 4* and shall be 48 inches (1219 mm) wide minimum. Where handrails are provided, accessible routes shall be 60 inches (1524 mm) wide minimum.

**Exception:** Handrails shall not be required on golf courses. Where handrails are provided on golf courses, the handrails shall not be required to comply with *Section 11B-505*.

**11B-1006.3 Golf car passages.** Golf car passages shall comply with *Section 11B-1006.3*.

**11B-1006.3.1 Clear width.** The clear width of golf car passages shall be 48 inches (1219 mm) minimum.



**FIGURE 11B-1005.3.2  
EXTENDED GROUND OR DECK SURFACE AT FISHING PIERS AND PLATFORMS**

**11B-1006.3.2 Barriers.** Where curbs or other constructed barriers prevent golf cars from entering a fairway, openings 60 inches (1524 mm) wide minimum shall be provided at intervals not to exceed 75 yards (69 m).

**11B-1006.4 Weather shelters.** A clear floor or ground space 60 inches (1524 mm) minimum by 96 inches (2438 mm) minimum shall be provided within weather shelters.

#### 11B-1007 Miniature golf facilities

**11B-1007.1 General.** Miniature golf facilities shall comply with *Section 11B-1007*.

**11B-1007.2 Accessible routes.** Accessible routes serving holes on miniature golf courses shall comply with *Division 4*. Accessible routes located on playing surfaces of miniature golf holes shall be permitted to use the exceptions in *Section 11B-1007.2*.

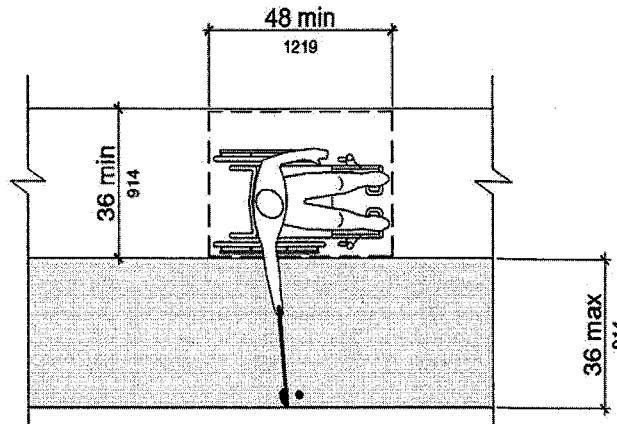
#### Exceptions:

1. Playing surfaces shall not be required to comply with *Section 11B-302.2*.
2. Where accessible routes intersect playing surfaces of holes, a 1 inch (25 mm) maximum curb shall be permitted for a width of 32 inches (813 mm) minimum.
3. A slope not steeper than 1:4 for a 4 inch (102 mm) maximum rise shall be permitted.
4. Ramp landing slopes specified by *Section 11B-405.7.1* shall be permitted to be 1:20 maximum.
5. Ramp landing length specified by *Section 11B-405.7.3* shall be permitted to be 48 inches (1219 mm) long minimum.
6. Ramp landing size specified by *Section 11B-405.7.4* shall be permitted to be 48 inches (1219 mm) minimum by 60 inches (1524 mm) minimum.
7. Handrails shall not be required on holes. Where handrails are provided on holes, the handrails shall not be required to comply with *Section 11B-505*.

**11B-1007.3 Miniature golf holes.** Miniature golf holes shall comply with *Section 11B-1007.3*.

**11B-1007.3.1 Start of play.** A clear floor or ground space 48 inches (1219 mm) minimum by 60 inches (1524 mm) minimum with slopes not steeper than 1:48 shall be provided at the start of play.

**11B-1007.3.2 Golf club reach range area.** All areas within holes where golf balls rest shall be within 36 inches (914 mm) maximum of a clear floor or ground space 36 inches (914 mm) wide minimum and 48 inches (1219 mm) long minimum having a running slope not steeper than 1:20. The clear floor or ground space shall be served by an accessible route.



**FIGURE 11B-1007.3.2  
GOLF CLUB REACH RANGE AREA**

#### 11B-1008 Play areas

**11B-1008.1 General.** Play areas shall comply with *Section 11B-1008*.

**11B-1008.2 Accessible routes.** Accessible routes serving play areas shall comply with *Division 4* and *Section 11B-1008.2* and shall be permitted to use the exceptions in *Sections 11B-1008.2.1* through *11B-1008.2.3*. Where accessible routes serve ground level play components, the vertical clearance shall be 80 inches high (2032 mm) minimum.

**11B-1008.2.1 Ground level and elevated play components.** Accessible routes serving ground level play components and elevated play components shall be permitted to use the exceptions in *Section 11B-1008.2.1*.

#### Exceptions:

1. Transfer systems complying with *Section 11B-1008.3* shall be permitted to connect elevated play components except where 20 or more elevated play components are provided no more than 25 percent of the elevated play components shall be permitted to be connected by transfer systems.
2. Where transfer systems are provided, an elevated play component shall be permitted to connect to another elevated play component as part of an accessible route.

**11B-1008.2.2 Soft contained play structures.** Accessible routes serving soft contained play structures shall be permitted to use the exception in *Section 11B-1008.2.2*.

**Exception:** Transfer systems complying with *Section 11B-1008.3* shall be permitted to be used as part of an accessible route.

**11B-1008.2.3 Water play components.** Accessible routes serving water play components shall be permitted to use the exceptions in *Section 11B-1008.2.3*.

**Exceptions:**

1. Where the surface of the accessible route, clear floor or ground spaces, or turning spaces serving water play components is submerged, compliance with *Sections 11B-302, 11B-403.3, 11B-405.2, 11B-405.3, and 11B-1008.2.6* shall not be required.
2. Transfer systems complying with *Section 11B-1008.3* shall be permitted to connect elevated play components in water.

**11B-1008.2.4 Clear width.** Accessible routes connecting play components shall provide a clear width complying with *Section 11B-1008.2.4*.

**11B-1008.2.4.1 Ground level.** At ground level, the clear width of accessible routes shall be 60 inches (1524 mm) minimum.

**Exceptions:**

1. In play areas less than 1000 square feet (93 m<sup>2</sup>), the clear width of accessible routes shall be permitted to be 44 inches (1118 mm) minimum, if at least one turning space complying with *Section 11B-304.3* is provided where the restricted accessible route exceeds 30 feet (9144 mm) in length.
2. The clear width of accessible routes shall be permitted to be 36 inches (914 mm) minimum for a distance of 60 inches (1524 mm) maximum provided that multiple reduced width segments are separated by segments that are 60 inches (1524 mm) wide minimum and 60 inches (1524 mm) long minimum.

**11B-1008.2.4.2 Elevated.** The clear width of accessible routes connecting elevated play components shall be 36 inches (914 mm) minimum.

**Exceptions:**

1. The clear width of accessible routes connecting elevated play components shall be permitted to be reduced to 32 inches (813 mm) minimum for a distance of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1219 mm) long minimum and 36 inches (914 mm) wide minimum.
2. The clear width of transfer systems connecting elevated play components shall be permitted to be 24 inches (610 mm) minimum.

**11B-1008.2.5 Ramps.** Within play areas, ramps connecting ground level play components and ramps connecting elevated play components shall comply with *Section 11B-1008.2.5*.

**11B-1008.2.5.1 Ground level.** Ramp runs connecting ground level play components shall have a running slope not steeper than 1:16.

**11B-1008.2.5.2 Elevated.** The rise for any ramp run connecting elevated play components shall be 12 inches (305 mm) maximum.

**11B-1008.2.5.3 Handrails.** Where required on ramps serving play components, the handrails shall comply with *Section 11B-505* except as modified by *Section 11B-1008.2.5.3*.

**Exceptions:**

1. Handrails shall not be required on ramps located within ground level use zones.
2. Handrail extensions shall not be required.

**11B-1008.2.5.3.1 Handrail gripping surfaces.**

Handrail gripping surfaces with a circular cross section shall have an outside diameter of 0.95 inch (24 mm) minimum and 1.55 inches (39 mm) maximum. Where the shape of the gripping surface is non-circular, the handrail shall provide an equivalent gripping surface.

**11B-1008.2.5.3.2 Handrail height.** The top of handrail gripping surfaces shall be 20 inches (508 mm) minimum and 28 inches (711 mm) maximum above the ramp surface.

**11B-1008.2.6 Ground surfaces.** Ground surfaces on accessible routes, clear floor or ground spaces, and turning spaces shall comply with *Section 11B-1008.2.6*.

**11B-1008.2.6.1 Accessibility.** Ground surfaces shall comply with ASTM F 1951. Ground surfaces shall be inspected and maintained regularly and frequently to ensure continued compliance with ASTM F 1951.

**11B-1008.2.6.2 Use zones.** Ground surfaces located within use zones shall comply with ASTM F 1292 (1999 edition or 2004 edition).

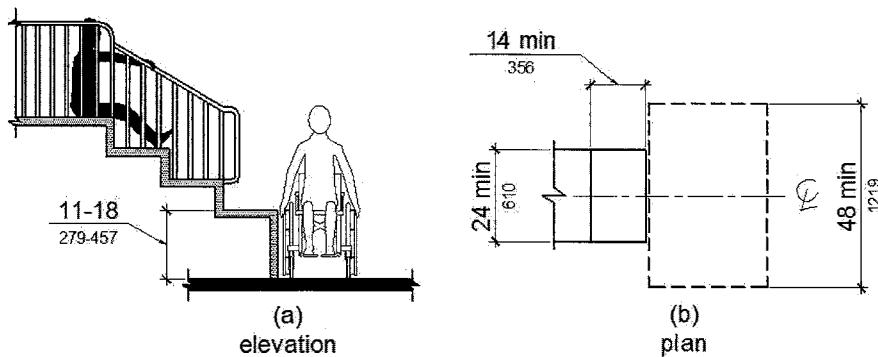
**11B-1008.3 Transfer systems.** Where transfer systems are provided to connect to elevated play components, transfer systems shall comply with *Section 11B-1008.3*.

**11B-1008.3.1 Transfer platforms.** Transfer platforms shall be provided where transfer is intended from wheelchairs or other mobility aids. Transfer platforms shall comply with *Section 11B-1008.3.1*.

**11B-1008.3.1.1 Size.** Transfer platforms shall have level surfaces 14 inches (356 mm) deep minimum and 24 inches (610 mm) wide minimum.

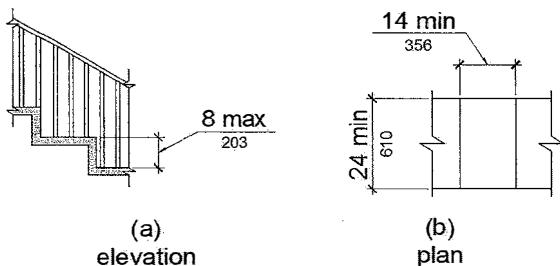
**11B-1008.3.1.2 Height.** The height of transfer platforms shall be 11 inches (279 mm) minimum and 18 inches (457 mm) maximum measured to the top of the surface from the ground or floor surface.

**11B-1008.3.1.3 Transfer space.** A transfer space complying with *Sections 11B-305.2 and 11B-305.3* shall be provided adjacent to the transfer platform. The 48 inch (1219 mm) long minimum dimension of the transfer space shall be centered on and parallel to the 24 inch (610 mm) long minimum side of the transfer platform. The side of the transfer platform serving the transfer space shall be unobstructed.

FIGURE 11B-1008.3.1  
TRANSFER PLATFORMS

**11B-1008.3.1.4 Transfer supports.** At least one means of support for transferring shall be provided.

**11B-1008.3.2 Transfer steps.** Transfer steps shall be provided where movement is intended from transfer platforms to levels with elevated play components required to be on accessible routes. Transfer steps shall comply with *Section 11B-1008.3.2*.

FIGURE 11B-1008.3.2  
TRANSFER STEPS

**11B-1008.3.2.1 Size.** Transfer steps shall have level surfaces 14 inches (356 mm) deep minimum and 24 inches (610 mm) wide minimum.

**11B-1008.3.2.2 Height.** Each transfer step shall be 8 inches (203 mm) high maximum.

**11B-1008.3.2.3 Transfer supports.** At least one means of support for transferring shall be provided.

**11B-1008.3.2.4 Contrasting stripe.** Striping complying with *Section 11B-504.4.1* shall be provided at each transfer step.

**11B-1008.4 Play components.** Ground level play components on accessible routes and elevated play components connected by ramps shall comply with *Section 11B-1008.4*.

**11B-1008.4.1 Turning space.** At least one turning space complying with *Section 11B-304* shall be provided on the same level as play components. Where swings are provided, the turning space shall be located immediately adjacent to the swing.

**11B-1008.4.2 Clear floor or ground space.** Clear floor or ground space complying with *Sections 11B-305.2* and *11B-305.3* shall be provided at play components.

**11B-1008.4.3 Play tables.** Where play tables are provided, knee clearance 24 inches (610 mm) high minimum, 17 inches deep (432 mm) minimum, and 30 inches (762 mm) wide minimum shall be provided. The tops of rims, curbs, or other obstructions shall be 31 inches (787 mm) high maximum.

**Exception:** Play tables designed and constructed primarily for children 5 years and younger shall not be required to provide knee clearance where the clear floor or ground space required by *Section 11B-1008.4.2* is arranged for a parallel approach.

**11B-1008.4.4 Entry points and seats.** Where play components require transfer to entry points or seats, the entry points or seats shall be 11 inches (279 mm) minimum and 24 inches (610 mm) maximum from the clear floor or ground space.

**Exception:** Entry points of slides shall not be required to comply with *Section 11B-1008.4.4*.

**11B-1008.4.5 Transfer supports.** Where play components require transfer to entry points or seats, at least one means of support for transferring shall be provided.

#### 11B-1009 Swimming pools, wading pools, and spas

**11B-1009.1 General.** Where provided, pool lifts, sloped entries, transfer walls, transfer systems, and pool stairs shall comply with *Section 11B-1009*.

**11B-1009.2 Pool lifts.** Pool lifts shall comply with *Section 11B-1009.2*.

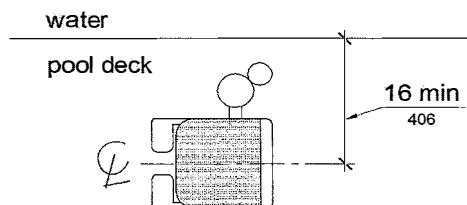
**11B-1009.2.1 Pool lift location.** Pool lifts shall be located where the water level is 36 inches (914 mm) minimum and 48 inches (1219 mm) maximum.

#### Exceptions:

1. Where the entire pool depth is less than 36 inches (914 mm) or greater than 48 inches (1219 mm), compliance with *Section 11B-1009.2.1* shall not be required.
2. Where multiple pool lift locations are provided, no more than one pool lift shall be required to be located in an area where the water level is 48 inches (1219 mm) maximum.

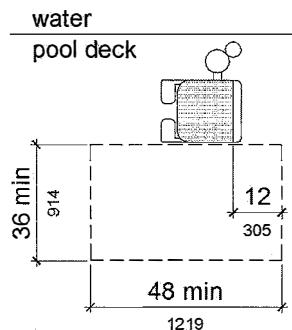
**11B-1009.2.2 Seat location.** In the raised position, the centerline of the seat shall be located over the deck and 16 inches (406 mm) minimum from the edge of the pool. The

deck surface between the centerline of the seat and the pool edge shall have a slope not steeper than 1:48.



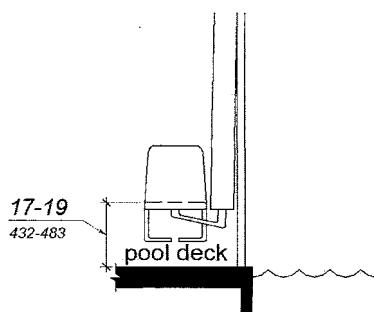
**FIGURE 11B-1009.2.2  
POOL LIFT SEAT LOCATION**

**11B-1009.2.3 Clear deck space.** On the side of the seat opposite the water, a clear deck space shall be provided parallel with the seat. The space shall be 36 inches (914 mm) wide minimum and shall extend forward 48 inches (1219 mm) minimum from a line located 12 inches (305 mm) behind the rear edge of the seat. The clear deck space shall have a slope not steeper than 1:48.



**FIGURE 11B-1009.2.3  
CLEAR DECK SPACE AT POOL LIFTS**

**11B-1009.2.4 Seat.** The seat shall be rigid and shall have a back support that is at least 12 inches (305 mm) tall. The height of the lift seat shall be designed to allow a stop at 17 inches (432 mm) minimum to 19 inches (483 mm) maximum measured from the deck to the top of the seat surface when in the raised (load) position. The seat shall have a restraint for the use of the occupant with operable parts complying with Section 11B-309.



**FIGURE 11B-1009.2.4  
POOL LIFT SEAT HEIGHT**

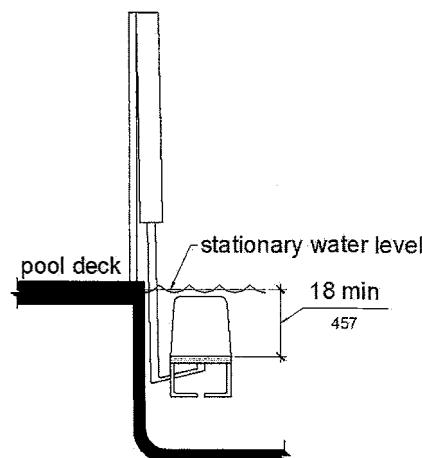
**11B-1009.2.5 Seat width.** The seat shall be 16 inches (406 mm) wide minimum.

**11B-1009.2.6 Footrests and armrests.** Footrests shall be provided and shall move with the seat. *The seat shall have two armrests. The armrest positioned opposite the water shall be removable or shall fold clear of the seat when the seat is in the raised (load) position.*

**Exception:** Footrests shall not be required on pool lifts provided in spas.

**11B-1009.2.7 Operation.** The lift shall be capable of unassisted operation from both the deck and water levels. Controls and operating mechanisms shall be unobstructed when the lift is in use and shall comply with Section 11B-309.4. *The lift shall be stable and not permit unintended movement when a person is getting into or out of the seat.*

**11B-1009.2.8 Submerged depth.** The lift shall be designed so that the seat will submerge to a water depth of 18 inches (457 mm) minimum below the stationary water level.



**FIGURE 11B-1009.2.8  
POOL LIFT SUBMERGED DEPTH**

**11B-1009.2.9 Lifting capacity.** Single person pool lifts shall have a weight capacity of 300 pounds (136 kg) minimum and be capable of sustaining a static load of at least one and a half times the rated load.

**11B-1009.3 Sloped entries.** Sloped entries shall comply with Section 11B-1009.3.

**11B-1009.3.1 Sloped entries.** Sloped entries shall comply with Division 4 except as modified in Sections 11B-1009.3.1 through 11B-1009.3.3.

**Exception:** Where sloped entries are provided, the surfaces shall not be required to be slip resistant.

**11B-1009.3.2 Submerged depth.** Sloped entries shall extend to a depth of 24 inches (610 mm) minimum and 30 inches (762 mm) maximum below the stationary water level. Where landings are required by Section 11B-405.7, at least one landing shall be located 24 inches (610 mm) minimum and 30 inches (762 mm) maximum below the stationary water level.

**Exception:** In wading pools, the sloped entry and landings, if provided, shall extend to the deepest part of the wading pool.

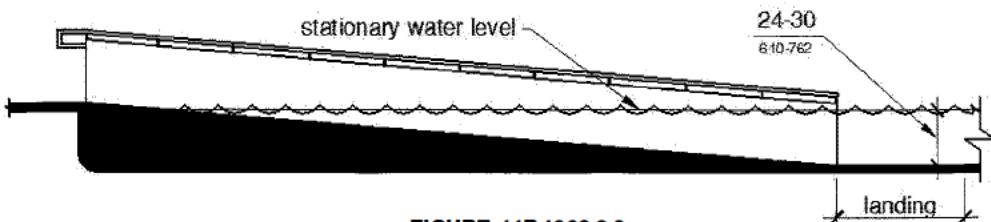


FIGURE 11B-1009.3.2  
SLOPED ENTRY SUBMERGED DEPTH

**11B-1009.3.3 Handrails.** At least two handrails complying with *Section 11B-505* shall be provided on the sloped entry. The clear width between required handrails shall be 33 inches (838 mm) minimum and 38 inches (965 mm) maximum.

**Exceptions:**

1. Handrail extensions specified by *Section 11B-505.10.1* shall not be required at the bottom landing serving a sloped entry.
2. Where a sloped entry is provided for wave action pools, leisure rivers, sand bottom pools, and other pools where user access is limited to one area, the handrails shall not be required to comply with the clear width requirements of *Section 11B-1009.3.3*.
3. Sloped entries in wading pools shall not be required to provide handrails complying with *Section 11B-1009.3.3*. If provided, handrails on sloped entries in wading pools shall not be required to comply with *Section 11B-505*.

**11B-1009.4 Transfer walls.** Transfer walls shall comply with *Section 11B-1009.4*.

**11B-1009.4.1 Clear deck space.** A clear deck space of 60 inches (1524 mm) minimum by 60 inches (1524 mm) minimum with a slope not steeper than 1:48 shall be provided at the base of the transfer wall. Where one grab bar is provided, the clear deck space shall be centered on the grab bar. Where two grab bars are provided, the clear deck space shall be centered on the clearance between the grab bars.

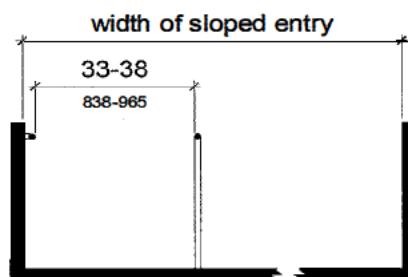


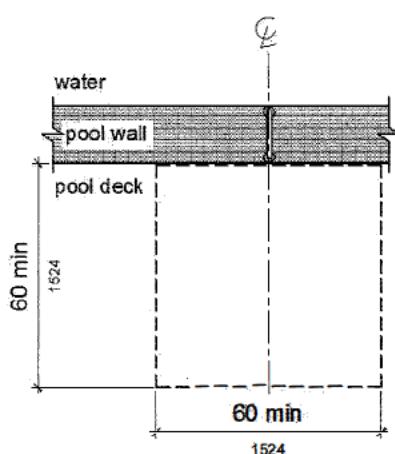
FIGURE 11B-1009.3.3  
HANDRAILS FOR SLOPED ENTRY

**11B-1009.4.2 Height.** The height of the transfer wall shall be 16 inches (406 mm) minimum and 19 inches (483 mm) maximum measured from the deck.

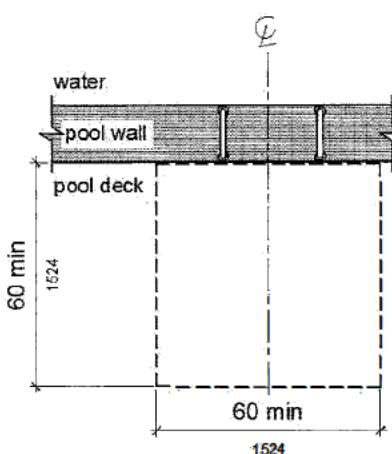
**11B-1009.4.3 Wall depth and length.** The depth of the transfer wall shall be 12 inches (305 mm) minimum and 16 inches (406 mm) maximum. The length of the transfer wall shall be 60 inches (1524 mm) minimum and shall be centered on the clear deck space.



FIGURE 11B-1009.4.2  
TRANSFER WALL HEIGHT

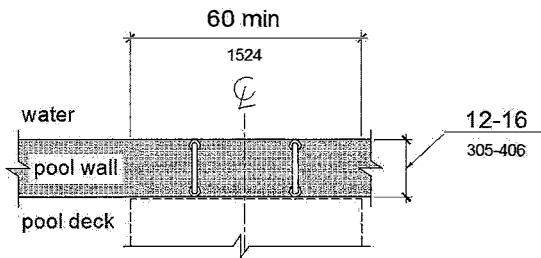


(a)



(b)

FIGURE 11B-1009.4.1  
CLEAR DECK SPACE AT TRANSFER WALLS



**FIGURE 11B-1009.4.3  
DEPTH AND LENGTH OF TRANSFER WALLS**

**11B-1009.4.4 Surface.** Surfaces of transfer walls shall not be sharp and shall have rounded edges.

**11B-1009.4.5 Grab bars.** At least one grab bar complying with *Section 11B-609* shall be provided on the transfer wall. Grab bars shall be perpendicular to the pool wall and shall extend the full depth of the transfer wall. The top of the gripping surface shall be 4 inches (102 mm) minimum and 6 inches (152 mm) maximum above transfer walls. Where one grab bar is provided, clearance shall be 24 inches (610 mm) minimum on both sides of the grab bar. Where two grab bars are provided, clearance between grab bars shall be 24 inches (610 mm) minimum.

**Exception:** Grab bars on transfer walls shall not be required to comply with *Section 11B-609.4*.

**11B-1009.5 Transfer systems.** Transfer systems shall comply with *Section 11B-1009.5*.

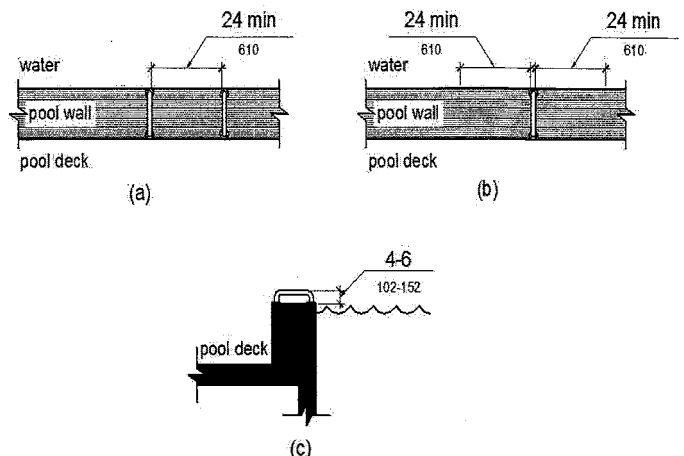
**11B-1009.5.1 Transfer platform.** A transfer platform shall be provided at the head of each transfer system. Transfer platforms shall provide 19 inches (483 mm) minimum clear depth and 24 inches (610 mm) minimum clear width.

**11B-1009.5.2 Transfer space.** A transfer space of 60 inches (1524 mm) minimum by 60 inches (1524 mm) minimum with a slope not steeper than 1:48 shall be provided at the base of the transfer platform surface and shall be centered along a 24 inch (610 mm) minimum side of the transfer platform. The side of the transfer platform serving the transfer space shall be unobstructed.

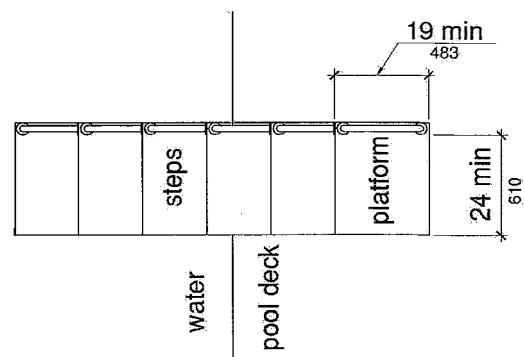
**11B-1009.5.3 Height.** The height of the transfer platform shall comply with *Section 11B-1009.4.2*.

**11B-1009.5.4 Transfer steps.** Transfer step height shall be 8 inches (203 mm) maximum. The surface of the bottom tread shall extend to a water depth of 18 inches (457 mm) minimum below the stationary water level.

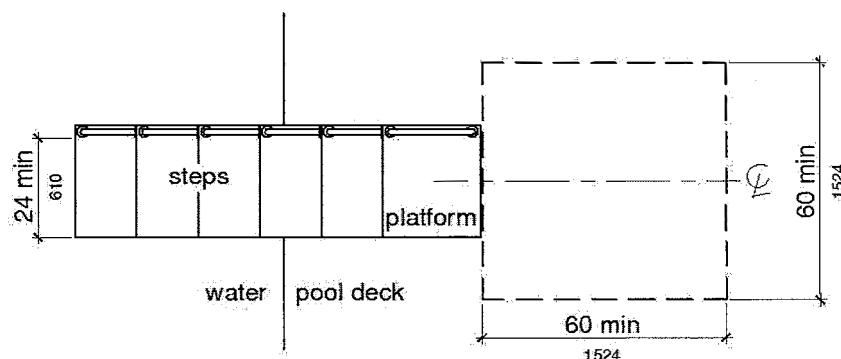
**11B-1009.5.5 Surface.** The surface of the transfer system shall not be sharp and shall have rounded edges.



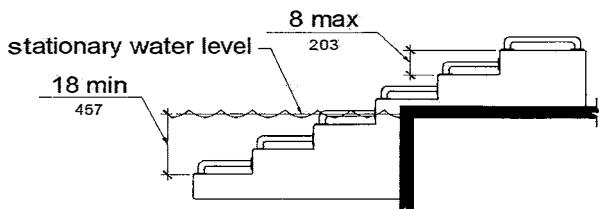
**FIGURE 11B-1009.4.5  
GRAB BARS FOR TRANSFER WALLS**



**FIGURE 11B-1009.5.1  
SIZE OF TRANSFER PLATFORM**

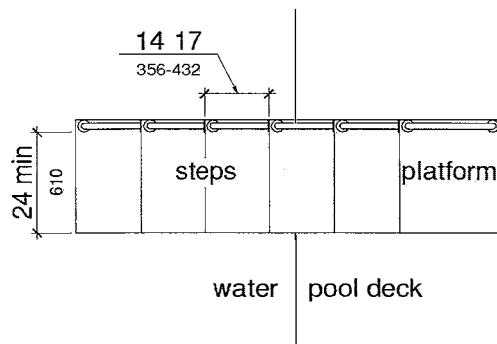


**FIGURE 11B-1009.5.2  
CLEAR DECK SPACE AT TRANSFER PLATFORM**



**FIGURE 11B-1009.5.4  
TRANSFER STEPS**

**11B-1009.5.6 Size.** Each transfer step shall have a tread clear depth of 14 inches (356 mm) minimum and 17 inches (432 mm) maximum and shall have a tread clear width of 24 inches (610 mm) minimum.



**FIGURE 11B-1009.5.6  
SIZE OF TRANSFER STEPS**

**11B-1009.5.7 Grab bars.** At least one grab bar on each transfer step and the transfer platform or a continuous grab bar serving each transfer step and the transfer platform shall be provided. Where a grab bar is provided on each step, the tops of gripping surfaces shall be 4 inches (102 mm) minimum and 6 inches (152 mm) maximum above

each step and transfer platform. Where a continuous grab bar is provided, the top of the gripping surface shall be 4 inches (102 mm) minimum and 6 inches (152 mm) maximum above the step nosing and transfer platform. Grab bars shall comply with *Section 11B-609* and be located on at least one side of the transfer system. The grab bar located at the transfer platform shall not obstruct transfer.

**Exception:** Grab bars on transfer systems shall not be required to comply with *Section 11B-609.4*.

**11B-1009.6 Pool stairs.** Pool stairs shall comply with *Section 11B-1009.6*.

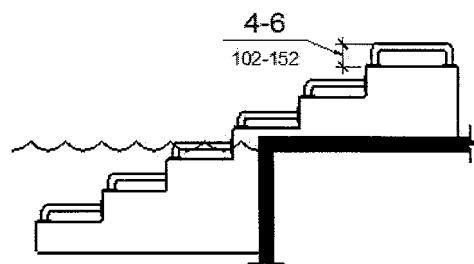
**11B-1009.6.1 Pool stairs.** Pool stairs shall comply with *Section 11B-504*.

**Exception:** Pool step riser heights shall not be required to be 4 inches (102 mm) high minimum and 7 inches (178 mm) high maximum provided that riser heights are uniform.

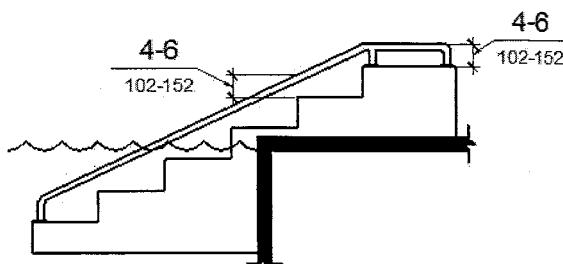
**11B-1009.6.2 Handrails.** The width between handrails shall be 20 inches (508 mm) minimum and 24 inches (610 mm) maximum. Handrail extensions required by *Section 11B-505.10.3* shall not be required on pool stairs.

**11B-1010 Shooting facilities with firing positions**

**11B-1010.1 Turning space.** A circular turning space 60 inches (1524 mm) diameter minimum with slopes not steeper than 1:48 shall be provided at shooting facilities with firing positions.



(a)  
individual grab bars



(b)  
continuous grab bars

**FIGURE 11B-1009.5.7  
GRAB BARS**

## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 12 – INTERIOR ENVIRONMENT

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter						X	X													
Adopt entire chapter as amended (amended sections listed below)	X		X	X					X	X	X	X								
Adopt only those sections that are listed below		X												X	X		X			
Chapter / Section																				
1203.1									X	X	X	X								
1203.1.1																		X		
1203.3.2																		X		
1203.4			X	X																
1203.4.2.1			X	X																
1203.5		X	X	X																
1204.1			X	X																
1204.1 w/Excs/			X						X	X	X	X								
1205.1			X	X																
1205.6	X																			
1206		X																		
1207.1			X	X																
1207.2			X	X																
1207.3			X	X																
1207.4			X	X																
1208		X																		
1208.1			X																	
1208.2									X	X	X	X								
1208.2.1									X	X	X	X								
1208.4			X																	
1209		X																		
1209.1.1																		X		
1210.1			X	X																
1211-1211.6			X	X																
1212			X	X																
1224									X											
1225										X										
1226											X									
1227												X								
1230													X							
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1251																X				
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1253																X				
1254																	X			

The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 111.



## CHAPTER 12

# INTERIOR ENVIRONMENT

### SECTION 1201 GENERAL

**1201.1 Scope.** The provisions of this chapter shall govern ventilation, temperature control, lighting, yards and courts, sound transmission, room dimensions, surrounding materials and rodent proofing associated with the interior spaces of buildings.

### SECTION 1202 DEFINITIONS

**1202.1 General.** The following terms are defined in Chapter 2:

SUNROOM.

THERMAL ISOLATION.

### SECTION 1203 VENTILATION

**1203.1 General.** Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *California Mechanical Code*.

**1203.2 Attic spaces.** Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilation openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. An airspace of not less than 1 inch (25 mm) shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150<sup>th</sup> of the area of the space ventilated.

#### Exceptions:

1. (*Not adopted by HCD*) The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided that not less than 50 percent and not more than 80 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.
2. (*Not adopted by HCD*) The net free cross-ventilation area shall be permitted to be reduced to 1/300 where a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.
3. Attic ventilation shall not be required when determined not necessary by the building official due to atmospheric or climatic conditions.

4. [*HCD 1 & HCD 2*] The net cross-ventilation area shall be permitted to be reduced to 1/300, provided that at least 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located no more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

5. [*HCD 1 & HCD 2*] The net cross-ventilation area shall be permitted to be reduced to 1/300 in Climate Zones 14 and 16, where a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.

**1203.2.1 Openings into attic.** Exterior openings into the attic space of any building intended for human occupancy shall be protected to prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. Openings for ventilation having a least dimension of not less than 1/16 inch (1.6 mm) and not more than 1/4 inch (6.4 mm) shall be permitted. Openings for ventilation having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of not less than 1/16 inch (1.6 mm) and not more than 1/4 inch (6.4 mm). Where combustion air is obtained from an *attic* area, it shall be in accordance with Chapter 7 of the *California Mechanical Code*.

**1203.3 Under-floor ventilation.** The space between the bottom of the floor joists and the earth under any building except spaces occupied by basements or cellars shall be provided with ventilation openings through foundation walls or exterior walls. Such openings shall be placed so as to provide cross ventilation of the under-floor space.

**1203.3.1 Openings for under-floor ventilation.** The net area of ventilation openings shall not be less than 1 square foot for each 150 square feet (0.67 m<sup>2</sup> for each 100 m<sup>2</sup>) of crawl-space area. Ventilation openings shall be covered for their height and width with any of the following materials, provided that the least dimension of the covering shall be not greater than 1/4 inch (6 mm):

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.
2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.
3. Cast-iron grilles or gratings.
4. Extruded load-bearing vents.

5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.
6. Corrosion-resistant wire mesh, with the least dimension not greater than  $\frac{1}{8}$  inch (3.2 mm).

**1203.3.1.1 [SPCB]** Openings for under-floor ventilation shall be not less than  $1\frac{1}{2}$  square feet ( $0.135 \text{ m}^2$ ) for each 25 linear feet (7620 linear mm) of exterior wall. They shall be covered with corrosion-resistant wire mesh with mesh openings not less than  $\frac{1}{4}$  inch (6.4 mm) nor more than  $\frac{1}{2}$  inch (13 mm) in any dimension.

**1203.3.2 Exceptions.** The following are exceptions to Sections 1203.3 and 1203.3.1:

1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.
2. The total area of ventilation openings is permitted to be reduced to  $\frac{1}{1,500}$  of the under-floor area where the ground surface is covered with a Class I vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.
3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet ( $1.02 \text{ L/s}$  for each  $10 \text{ m}^2$ ) of crawl space floor area and the ground surface is covered with a Class I vapor retarder.
4. Ventilation openings are not required where the ground surface is covered with a Class I vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with the *California Energy Code*.
5. For buildings in flood hazard areas as established in Section 1612.3, the openings for under-floor ventilation shall be deemed as meeting the flood opening requirements of ASCE 24 provided that the ventilation openings are designed and installed in accordance with ASCE 24.
6. [SPCB] For purposes of structural pest control inspections, ventilation shall be considered inadequate when the lack thereof has contributed to the growth of wood-destroying pests or organisms.

**1203.4 Natural ventilation.** Natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.

**[HCD 1]** In employee housing, all openable windows in rooms used for living, dining, cooking or sleeping purposes, and toilet and bath buildings, shall be provided and maintained with insect screening.

**[HCD 1]** Door openings of rooms used for dining, cooking, toilet and bathing facilities in employee housing shall be provided and maintained with insect screening or with solid

doors equipped with self-closing devices in lieu thereof, when approved by the enforcement agency.

**[HCD 1]** The windows, doors, louvers or other approved closeable openings not required by Section 1029 may open into a passive solar energy collector for ventilation required by this section. The area of ventilation openings to the outside of the passive solar energy collector shall be increased to compensate for the openings required by the interior space.

**1203.4.1 Ventilation area required.** The openable area of the openings to the outdoors shall be not less than 4 percent of the floor area being ventilated.

**1203.4.1.1 Adjoining spaces.** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet ( $2.3 \text{ m}^2$ ). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

**Exception:** Exterior openings required for ventilation shall be permitted to open into a sunroom with thermal isolation or a patio cover provided that the openable area between the sunroom addition or patio cover and the interior room shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet ( $1.86 \text{ m}^2$ ). The openable area of the openings to the outdoors shall be based on the total floor area being ventilated.

**1203.4.1.2 Openings below grade.** Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

**1203.4.2 Contaminants exhausted.** Contaminant sources in naturally ventilated spaces shall be removed in accordance with the *California Mechanical Code* and the *California Fire Code*.

**1203.4.2.1 Bathrooms.** Rooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with the *California Mechanical Code*.

The minimum exhaust rate shall not be less than that established by Table 403.7 "Minimum Exhaust Rates." See *California Mechanical Code*, Chapter 5, for additional provisions related to environmental air ducts.

**[HCD 1]** In addition to the requirements in this section and in the *California Mechanical Code*, bathrooms in Group R occupancies shall be mechanically ventilated in accordance with the *California Green Building Standards Code (CALGreen)*, Chapter 4, Division 4.5.

**1203.4.3 Openings on yards or courts.** Where natural ventilation is to be provided by openings onto yards or courts, such yards or courts shall comply with Section 1206.

**1203.5 Other ventilation and exhaust systems.** Ventilation and exhaust systems for occupancies and operations involving flammable or combustible hazards or other contaminant sources as covered in the *California Mechanical Code* or the *California Fire Code* shall be provided as required by both codes.

## SECTION 1204 TEMPERATURE CONTROL

**1204.1 Equipment and systems.** Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining an indoor temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

### Exceptions:

1. Space heating systems are not required for interior spaces where the primary purpose of the space is not associated with human comfort.
2. *[HCD 1] For limited-density owner-built rural dwellings, a heating facility or appliance shall be installed in each dwelling subject to the provisions of Subchapter 1, Chapter 1, Title 25, California Code of Regulations, commencing with Section 74; however, there shall be no specified requirement for heating capacity or temperature maintenance. The use of solid-fuel or solar-heating devices shall be deemed as complying with the requirements of this section. If nonrenewable fuel is used in these dwellings, rooms so heated shall meet current installation standards.*
3. *[OSHPD 1, 2, 3 & 4] Space heating systems shall comply with the requirements of the California Mechanical Code.*
4. *[HCD 1] When a passive solar energy collector is designed as a conditioned area it shall comply with the California Energy Code, Title 24, Part 6. Non-conditioned passive solar energy collectors are exempt from Title 24, Part 6.*

## SECTION 1205 LIGHTING

**1205.1 General.** Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings in accordance with Section 1205.2 or shall be provided with artificial light in accordance with Section 1205.3. Exterior glazed openings shall open directly onto a public way or onto a yard or court in accordance with Section 1206.

*[HCD 1] Glazed openings may open into a passive solar energy collector provided the area of exterior glazed openings in the passive solar energy collector is increased to compensate for the area required by the interior space.*

**1205.2 Natural light.** The minimum net glazed area shall be not less than 8 percent of the floor area of the room served.

**1205.2.1 Adjoining spaces.** For the purpose of natural lighting, any room is permitted to be considered as a portion of an adjoining room where one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room or 25 square feet (2.32 m<sup>2</sup>), whichever is greater.

**Exception:** Openings required for natural light shall be permitted to open into a sunroom with thermal isolation or a patio cover where the common wall provides a glazed area of not less than one-tenth of the floor area of the interior room or 20 square feet (1.86 m<sup>2</sup>), whichever is greater.

**1205.2.2 Exterior openings.** Exterior openings required by Section 1205.2 for natural light shall open directly onto a public way, yard or court, as set forth in Section 1206.

### Exceptions:

1. Required exterior openings are permitted to open into a roofed porch where the porch:
  - 1.1. Abuts a public way, yard or court;
  - 1.2. Has a ceiling height of not less than 7 feet (2134 mm); and
  - 1.3. Has a longer side at least 65 percent open and unobstructed.
2. Skylights are not required to open directly onto a public way, yard or court.

**1205.3 Artificial light.** Artificial light shall be provided that is adequate to provide an average illumination of 10 footcandles (107 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

**1205.4 Stairway illumination.** Stairways within dwelling units and exterior stairways serving a dwelling unit shall have an illumination level on tread runs of not less than 1 footcandle (11 lux). Stairs in other occupancies shall be governed by Chapter 10.

**1205.4.1 Controls.** The control for activation of the required stairway lighting shall be in accordance with the *California Electrical Code*.

**1205.5 Emergency egress lighting.** The means of egress shall be illuminated in accordance with Section 1006.1.

**1205.6 Campus lighting for parking facilities and primary walkways at California state universities, colleges and community colleges.** Artificial light shall be provided for parking facilities and primary walkways at California State Universities, Colleges and Community Colleges in accordance with provisions of this subsection. This subsection shall not apply to the University of California unless the Regents of the University of California, by resolution, make it applicable.

**1205.6.1 Lighting requirements.** Based on the recommendations of the most current edition of the Illumination Engineering Society lighting handbook, the following lighting standards shall be used for all new construction of open parking facilities, covered parking facilities and primary walkways:

1. Open and covered parking facilities.
  - 1.1. Medium-level activity usage when medium usage is present.
  - 1.2. High-level activity usage when high usage is present.
2. Primary campus walkways.
  - 2.1. Medium-level activity usage when medium usage is present.

2.2. High-level activity usage when high usage is present.

## SECTION 1206 YARDS OR COURTS

**1206.1 General.** This section shall apply to yards and courts adjacent to exterior openings that provide natural light or ventilation. Such yards and courts shall be on the same lot as the building.

**1206.2 Yards.** Yards shall be not less than 3 feet (914 mm) in width for buildings two stories or less above grade plane. For buildings more than two stories above grade plane, the minimum width of the yard shall be increased at the rate of 1 foot (305 mm) for each additional story. For buildings exceeding 14 stories above grade plane, the required width of the yard shall be computed on the basis of 14 stories above grade plane.

**1206.3 Courts.** Courts shall be not less than 3 feet (914 mm) in width. Courts having windows opening on opposite sides shall be not less than 6 feet (1829 mm) in width. Courts shall be not less than 10 feet (3048 mm) in length unless bounded on one end by a public way or yard. For buildings more than two stories above grade plane, the court shall be increased 1 foot (305 mm) in width and 2 feet (610 mm) in length for each additional story. For buildings exceeding 14 stories above grade plane, the required dimensions shall be computed on the basis of 14 stories above grade plane.

**1206.3.1 Court access.** Access shall be provided to the bottom of courts for cleaning purposes.

**1206.3.2 Air intake.** Courts more than two stories in height shall be provided with a horizontal air intake at the bottom not less than 10 square feet ( $0.93\text{ m}^2$ ) in area and leading to the exterior of the building unless abutting a yard or public way.

**1206.3.3 Court drainage.** The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the *California Plumbing Code*.

## SECTION 1207 SOUND TRANSMISSION

**1207.1 Scope.** This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units and sleeping units or between dwelling units and sleeping units and adjacent public areas such as halls, corridors, stairs or service areas.

**1207.2 Air-borne sound.** Walls, partitions and floor/ceiling assemblies separating dwelling units and sleeping units from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings.

> This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

**1207.2.1 Masonry.** The sound transmission class of concrete masonry and clay masonry assemblies shall be calcu-

lated in accordance with TMS 0302 or determined through testing in accordance with ASTM E 90.

**1207.3 Structure-borne sound.** Floor/ceiling assemblies between dwelling units and sleeping units or between a dwelling unit or sleeping unit and a public or service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

**Exception:** Impact sound insulation is not required for floor-ceiling assemblies over nonhabitable rooms or spaces not designed to be occupied, such as garages, mechanical rooms or storage areas.

**1207.4 Allowable interior noise levels.** Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

## SECTION 1208 INTERIOR SPACE DIMENSIONS

**1208.1 Minimum room widths.** Habitable spaces, other than a kitchen, shall be not less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a clear passageway of not less than 3 feet (914 mm) between counter fronts and appliances or counter fronts and walls.

[HCD 1] For limited-density owner-built rural dwellings, there shall be no requirements for room dimensions, provided there is adequate light and ventilation and adequate means of egress.

**1208.2 Minimum ceiling heights.** Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

### Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center shall be permitted to project not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.
3. Mezzanines constructed in accordance with Section 505.1.
4. [OSHPD 1, 2 & 3] Minimum ceiling heights shall comply with Section 1224.4.10.
5. [OSHPD 4] Minimum ceiling heights shall comply with Section 1227.8

**1208.2.1 Furred ceiling.** Any room with a furred ceiling shall be required to have the minimum ceiling height in two-thirds of the area thereof, but in no case shall the height of the furred ceiling be less than 7 feet (2134 mm).

**1208.3 Room area.** Every dwelling unit shall have no fewer than one room that shall have not less than 120 square feet ( $13.9 \text{ m}^2$ ) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet ( $6.5 \text{ m}^2$ ).

**Exception:** Kitchens are not required to be of a minimum floor area.

**1208.4 Efficiency dwelling units.** [HCD 1] Unless modified by local ordinance pursuant to Health and Safety Code Section 17958.1, efficiency dwelling units shall comply with the following:

1. The unit shall have a living room of not less than 220 square feet ( $20.4 \text{ m}^2$ ) of floor area. An additional 100 square feet ( $9.3 \text{ m}^2$ ) of floor area shall be provided for each occupant of such unit in excess of two.
2. The unit shall be provided with a separate closet.
3. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and ventilation conforming to this code shall be provided.
4. The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower.

## SECTION 1209 ACCESS TO UNOCCUPIED SPACES

**1209.1 Crawl spaces.** Crawl spaces shall be provided with no fewer than one access opening which shall be not less than 18 inches by 24 inches (457 mm by 610 mm).

**1209.1.1 [SPCB]** Accessible under-floor areas shall be provided with an 18-inch by 24-inch (457 mm by 610 mm) access crawl hole. Pipes, ducts and other nonstructural construction shall not interfere with the accessibility to or within under-floor areas.

**1209.2 Attic spaces.** An opening not less than 20 inches by 30 inches (559 mm by 762 mm) shall be provided to any attic area having a clear height of over 30 inches (762 mm). Clear headroom of not less than 30 inches (762 mm) shall be provided in the attic space at or above the access opening.

**1209.3 Mechanical appliances.** Access to mechanical appliances installed in under-floor areas, in attic spaces and on roofs or elevated structures shall be in accordance with the California Mechanical Code.

## SECTION 1210 TOILET AND BATHROOM REQUIREMENTS

**[P] 1210.1 Required fixtures.** The number and type of plumbing fixtures provided in any occupancy shall comply with the California Plumbing Code.

**1210.2 Finish materials.** Walls, floors and partitions in toilet and bathrooms shall comply with Sections 1210.2.1 through 1210.2.4.

**1210.2.1 Floors and wall bases.** In other than dwelling units, toilet, bathing and shower room floor finish materi-

als shall have a smooth, hard, nonabsorbent surface. The intersections of such floors with walls shall have a smooth, hard, nonabsorbent vertical base that extends upward onto the walls not less than 4 inches (102 mm).

**1210.2.2 Walls and partitions.** Walls and partitions within 2 feet (610 mm) of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of not less than 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

**Exception:** This section does not apply to the following buildings and spaces:

1. Dwelling units and sleeping units.
2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

**1210.2.3 Showers.** Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth, nonabsorbent surface to a height not less than 70 inches (1778 mm) above the drain inlet.

**1210.2.4 Waterproof joints.** Built-in tubs with showers shall have waterproof joints between the tub and adjacent wall.

**[P] 1210.3 Privacy.** Privacy at water closets and urinals shall be provided in accordance with Sections 1210.3.1 and 1210.3.2.

**[P] 1210.3.1 Water closet compartment.** Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

### Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 occupancy housing areas.

**[P] 1210.3.2 Urinal partitions.** Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The walls or partitions shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the

urinal measured from the finished backwall surface, whichever is greater.

**Exceptions:**

1. Urinal partitions shall not be required in a single-occupant or family or assisted-use toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

**1210.4 Toilet room location.** Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

**SECTION 1211 [HCD 1 & HCD 2]  
GARAGE DOOR SPRINGS**

**1211.1 General.** This section shall apply to applications listed in Sections 1.8.2.1.1 and 1.8.2.1.3 regulated by the Department of Housing and Community Development.

**1211.1.1 Extension garage door springs.** Every extension garage door spring sold or offered for sale, whether new or as a replacement, or installed in any garage or carport which is accessory to an apartment house, hotel, motel or dwelling shall conform to the following requirements:

Hard-drawn spring wire shall conform to ASTM A 227 06 (2011) or a more current version, and shall be made by the steel processes described therein, conforming to the chemical composition requirements listed and meeting the standards of steel heat as set forth by the ladle analysis. Wire tensile strength and dimension variations shall meet the prescribed properties of established standards.

Oil-tempered wire shall conform to ASTM A 229-12 or a more current version, and shall be made by the steel processes described therein, conforming to the chemical composition requirements listed and meeting the standards of steel heat as set forth by the ladle analysis. Wire tensile strength and dimension variations shall meet the prescribed properties of established standards.

Extension springs shall be fabricated from either hard-drawn spring wire or oil-tempered wire as specified above.

**1211.2 Design standards.** Minimum design standard shall be 9,000 cycles. (One cycle is equal to door opening plus door closing at maximum working load.)

**1211.3 Certification.**

Mill certification of wire physical tests and chemical properties shall be kept on file by the spring manufacturer.

Physical cycling tests shall be performed for each extension spring design and shall be certified by an approved testing agency acceptable to the department and reports kept on file by the manufacturer.

Containment devices shall be physically tested for each extension spring design by installing the device on the spring and by destroying the spring at maximum recommended stretch. Containment tests shall be certified by an approved testing agency acceptable to the department and reports kept on file by the manufacturer.

**1211.4 Containment devices.** Each extension spring shall be equipped with an approved device capable of restraining the spring or any part thereof in the event it breaks.

**1211.5 Identification.** Extension springs shall be permanently identified as to manufacturer and also to indicate maximum recommended stretch. Both extension springs and containment devices shall bear information stating that they have been manufactured in accordance with requirements of the California Department of Housing and Community Development.

**1211.6 Installation.** Installation of extension springs, containment devices and hardware shall be in accordance with the manufacturer's installation instructions. Instructions shall be provided by the manufacturer and shall specify the approved method of restraint and maximum recommended stretch. Unless otherwise permitted by the manufacturer's installation instructions, the hardware and extension springs shall be mounted to nominal 12 by 6 framing members, conforming to the applicable provisions of Section 2303.

**SECTION 1212 [HCD 1]  
POLLUTANT CONTROL**

**1212.1 Finish material pollutant control.** Finish materials, including adhesives, sealants, caulk, paints and coatings, aerosol paints and coatings, carpet systems, carpet cushion, carpet adhesive, resilient flooring systems, and composite wood products shall meet the volatile organic compound (VOC) emission limits in accordance with the California Green Building Standards Code (CALGreen), Chapter 4, Division 4.5.

**SECTION 1213  
Reserved**

**SECTION 1214  
Reserved**

**SECTION 1215  
Reserved**

**SECTION 1216  
Reserved**

**SECTION 1217  
Reserved**

**SECTION 1218  
Reserved**

**SECTION 1219  
Reserved**

**SECTION 1220  
Reserved**

**SECTION 1221  
Reserved**

**SECTION 1222  
Reserved**

## **SECTION 1223 Reserved**

## **SECTION 1224 [OSHPD 1] HOSPITALS**

**1224.1 Scope.** The provisions of this section shall apply to general acute-care hospitals, acute psychiatric hospitals and general acute-care hospitals providing only acute medical rehabilitation center services. The provisions of Section 1225 shall apply to distinct part skilled nursing and intermediate-care services on a general acute-care or acute psychiatric hospital license, provided either in a separate unit or a freestanding building.

**1224.2 Application.** New buildings and additions, alterations or repairs to existing buildings subject to licensure shall comply with applicable provisions of the California Electrical Code, California Mechanical Code, California Plumbing Code, California Fire Code (Parts 3, 4, 5 and 9 of Title 24) and this section.

### **Exceptions:**

1. Facilities licensed and in operation prior to the effective date of this section shall not be required to institute corrective alterations or construction to comply with any new requirements imposed thereby or subsequently, except where specifically required or where the enforcing agency determines that a definite hazard to health and safety exists. Facilities for which preliminary drawings have been submitted to the enforcing agency prior to the effective date of this change shall not be required to comply with such new requirements, provided working drawings are submitted within one year of the effective date of such new requirements.
2. The provisions of this section do no prohibit the use of alternate space utilization, new concepts of design, treatment techniques, equipment and alternate finish materials provided the intent of this section is accommodated and written approval for such alternative is granted by the enforcing agency. Written substantiating evidence in support of the alternate and a written request for consideration shall be submitted to the enforcing agency.
3. Nothing in this section shall prohibit the provisions of required services from a centralized service facility serving two or more licensed facilities when approved in writing by the licensing agency. Buildings and required spaces for services provided in a separate centralized services facility shall comply with all applicable provisions of these regulations and applicable local codes and ordinances for the services so provided.
4. Acute psychiatric hospitals and general acute-care hospitals providing only acute medical rehabilitation center services may provide for surgical and anesthesia services to be provided by an outside licensed facility when approved by the licensing agency.
5. When the Corrections Standards Authority, the Department of Corrections or the Department of

Youth Authority determines that a particular requirement for hospitals located in a correctional facility may compromise the safety, security or protection of staff, inmates or property, the enforcement agency shall consider an alternate design.

### **1224.3 Definitions.**

**AIR CONDITIONING.** The process or system by which simultaneously the temperature, humidity, air motion and quality are maintained within required limits.

**AIRBORNE INFECTION ISOLATION ROOM.** A single-occupancy patient room where environmental factors are controlled in an effort to minimize the transmission of those infectious agents usually spread from person to person by droplet nuclei associated with coughing and inhalation.

**AMBULATORY CARE.** A defined health care encounter(s) of less than 24 hours in duration that requires direct professional health care support within a specific facility.

**AMBULATORY SURGICAL FACILITY.** Any surgical facility organized for the purpose of providing procedural, invasive surgical care to patients with the expectation that they will be recovered sufficiently to be discharged in less than a 24-hour period.

**ANGIOGRAPHY.** The radiographic visualization of blood vessels following introduction of contrast material for purposes of diagnosis.

**BASIC SERVICES.** Those essential services required for licensure as a hospital, including medical, nursing, surgical, anesthesia, laboratory, radiology, pharmacy, dietary services and support services. See "SUPPLEMENTAL SERVICES."

**BIOTERRORISM.** The use, or threat of use, of biological agents to intimidate a political entity or population group.

**CENTRAL AIR-HANDLING SYSTEMS.** Any units requiring ductwork on the supply or inlet side and serving more than one room.

**COURT.** An open exterior space bounded on three or more sides by the walls of a structure.

**ENVIRONMENT OF CARE.** Those features in a built health care entity that are created, structured, and maintained to support quality health care.

**EXAM ROOM.** A room with a bed, stretcher, or examination table and capability for periodic monitoring (e.g., measurement of blood pressure or pulse oximetry) in which procedures that do not require a specialized suite can be performed (e.g., pelvic examination, blood transfusion).

**FLOOR AREA, CLEAR.** The actual occupied area exclusive of fixed or wall-mounted cabinets, built-in shelves, toilet rooms, closets, lockers, wardrobes, alcoves, anterooms or vestibules.

**GENERAL ACUTE-CARE HOSPITAL.** A hospital, licensed by the California Department of Public Health, having a duly constituted governing body with overall administrative and professional responsibility and an organized medical staff which provides 24-hour inpatient care, including the basic services.

**HANDWASHING STATION.** An area that provides a hand-washing fixture, cleansing agents and means for drying

**hands.** Refer to the California Plumbing Code, Section 210.0 for the definition of handwashing fixture.

**HOSPITAL.** A general acute-care hospital, including those providing only acute medical rehabilitation center services and acute psychiatric hospitals.

**HOUSEKEEPING.** Services anywhere within a health care facility that include general cleaning and tidying and the provision and positioning of identified materials, e.g., soaps, towels, etc. (While routine disinfection protocols can be included in such a definition, the definition is not intended to include complex, nonroutine disinfection procedures nor the nonroutine disposition of hazardous materials such as potentially toxic drugs or other chemicals and radioactive wastes.)

**LDR.** Labor, Delivery, Recovery (an unlicensed patient bed)

**LDRP.** Labor, Delivery, Recovery, Postpartum (a licensed patient bed)

**LICENSING AGENCY.** The Department of Public Health, Licensing and Certification.

**MONOLITHIC.** A surface free of fissures, cracks, perforations, and crevices.

**MONOLITHIC CEILING.** A ceiling constructed with a surface free of fissures, cracks, and crevices. Any penetrations such as lights, diffusers, and access panels shall be sealed or gasketed. Lay-in ceilings are not considered "monolithic."

**NURSING UNIT.** A designated patient care area of the hospital which is planned, organized, operated and maintained to function as a unit. It includes patient rooms with adequate support facilities, services and personnel providing nursing care and necessary management of patients.

**OPERATING ROOM.** A room specifically designed for the performance of surgical procedures. (In common understanding, this means most types of surgical procedures, especially those involving the administration of anesthesia, multiple personnel, recovery room access, and a fully controlled environment.)

**OUTPATIENT SERVICE.** An organizational unit of the hospital, which provides nonemergency healthcare services to patients.

**PATIENT ROOM.** Licensed patient bed rooms.

**PERIOPERATIVE.** Patient care and other related supportive activities before, during or after the operative event.

**PROTECTIVE ENVIRONMENT.** A bedded unit or patient room where severely immunosuppressed patients are cared for.

**RESTRICTED AREA.** A designated space with limited access eligibility. Such space has one or more of the following attributes: specific signage, physical barriers, security controls and protocols that delineate requirements for monitoring, maintenance, attire, and use. The term is often applied to specialized procedure suites, such as operating rooms and suites, interventional imaging, cardiac catheterization labs, angiography suites, etc.

**SCRUB SINK.** A sink used to wash and scrub the hands and arms during the aseptic preparation for surgery, and equipped with a supply spout and controls as required for a handwashing fixture. Refer to the California Plumbing Code Sections 210.0 and 221.0.

**SERVICE SINK.** A sink located in a housekeeping room and designed for the purpose of cleaning mops and the disposal of waste water.

**SUB-ACUTE CARE.** A segment within a continuum of levels of care determined by patient acuity, clinical stability, and resource needs.

**SUPPLEMENTAL SERVICE.** An inpatient or outpatient service which is not required to be provided by law or regulation for licensure. A supplemental service, when provided, must accommodate the provisions of this section.

**Note:** See "BASIC SERVICES."

**SURGICAL SERVICE SPACE.** A space that includes the operating room(s) and service areas.

#### 1224.4 GENERAL CONSTRUCTION.

**1224.4.1 Services/systems and utilities.** See Section 3416A or 3424 for single-story light frame skilled nursing facilities and intermediate care facilities.

**1224.4.2 Service spaces.** Spaces for dietary, laundry, morgue, ambulance entrance, receiving areas, power plants, mechanical equipment, incinerator, garbage can cleaning, automobile parking and storage areas for garbage, trash and medical gases shall be located and constructed to minimize noise, steam, odors, hazards and unsightliness in patient-care areas and bedrooms.

**1224.4.3 Treatment spaces.** Radiology, laboratory, pharmacy, physical therapy and service spaces serving only outpatients and similar outpatient service departments shall not be located in nursing units, surgical units, perinatal units, nursery areas, central sterilization rooms, food-service' areas, power plants, mechanical equipment rooms, maintenance shops, general storage, laundry, employees' dressing or housekeeping facilities.

**Exception:** Physical and occupational therapy spaces of a rehabilitation service may serve both outpatients and inpatients.

#### 1224.4.4 Support areas for patients.

##### 1224.4.4.1 Examination and treatment rooms.

**1224.4.4.1.1 Examination room.** Unless specified elsewhere, if an exam room is provided, it shall have a minimum clear floor area of 80 square feet ( $7.4 \text{ m}^2$ ), the least dimension of which shall be 8 feet (2438mm). The room shall contain a handwashing fixture and accommodations for written or electronic documentation shall be provided.

**1224.4.4.1.2 Treatment room.** Unless specified elsewhere, if a treatment room is provided, it shall have a minimum clear floor area of 120 square feet ( $11.15 \text{ m}^2$ ), the least dimension of which shall be 10 feet (3048 mm). A minimum of 3 feet (914 mm) is required between the sides and foot of the bed/gurney/table and any wall or other fixed obstruction. The room shall contain an examination light, a work counter for medical equipment, a handwashing fixture, cabinets, medication storage and counter space for writing or electronic documentation. Multi-bed treatment rooms shall have separate

patient cubicles with a minimum clear floor area of 80 square feet ( $7.4 \text{ m}^2$ ) per cubicle. Each cubicle shall contain an examination light, counter and storage facilities. In multi-bed treatment rooms, a handwashing fixture shall be provided in the room for each three or fewer cubicles.

**1224.4.4.1.3 Airborne infection isolation exam/treatment room.** When provided, the airborne infection isolation room shall be an exam/treatment room, shall be labeled with the words "Airborne Infection Room", and provide the following:

1. **Capacity.** Each airborne infection isolation exam/treatment room shall contain only one examination table or recliner.
2. **Handwashing station.** A handwashing station shall be located in each airborne infection isolation exam/treatment room.
3. **Gowning and storage area.** An area for gowning and storage of clean and soiled materials shall be located directly outside or inside the entry door to the airborne infection isolation exam/treatment room.
4. **Doors.** Room doors shall be self-closing and include latching devices.
5. **Sealed-tight room.** Room perimeter walls, ceiling, floors, doors and penetration shall be sealed tightly to minimize air infiltration from the outside or from other spaces.
6. **Ventilation.** The ventilation shall be provided as required by the California Mechanical Code for airborne infection isolation room.

**1224.4.4.1.3.1 Airborne infection isolation exam/treatment anteroom.** An airborne infection isolation anteroom is not required; however, when an anteroom is provided, it shall meet the following requirements:

1. The anteroom shall provide space for persons to don personal protective equipment before entering the patient room.
2. All doors to the anteroom shall have self-closing devices.
3. The anteroom shall provide storage of personal protective equipment (e.g. respirators, gowns, gloves) and clean equipment.
4. Ventilation shall be provided in the anteroom as required by the California Mechanical Code for airborne infection isolation anteroom.

#### **1224.4.4.2 Specimen and blood collection facilities.**

**1224.4.4.2.1 Specimen collection facilities.** When provided, specimen collection facilities shall comply with the following requirements:

1. Urine collection rooms shall be equipped with a water closet and handwashing station.

**Exception:** The handwashing station may be located immediately outside the collection room when the specimen is used for drug testing.

2. Use of the toilet room provided within the examination and treatment room shall be permitted for specimen collection.

**1224.4.4.2.2 Blood collection facilities.** When provided, blood collection facilities shall comply with the following requirements:

1. Space for a chair and work counter shall be provided.
2. A handwashing station shall be provided.

**1224.4.5 Outpatient waiting rooms.** Waiting rooms for outpatients shall provide a seating area and space for wheelchairs and have public corridor access to, or provisions for, public toilet, drinking fountain and telephone.

**Note:** One waiting area may serve more than one department or service.

**1224.4.5.1 Outpatient access.** If x-ray examinations are to be performed on outpatients, outpatient access to the radiological spaces shall not traverse a nursing unit.

**Exception:** Satellite radiology, laboratory, pharmacy, and physical and occupational therapy space serving inpatients may be located in nursing units and inpatient treatment areas.

#### **1224.4.6 Miscellaneous requirements.**

**1224.4.6.1 Station outlets.** Station outlets for oxygen, vacuum, and medical air shall comply with Table 1224.4.6.1.

**1224.4.6.2 Gas and vacuum systems.** The design, installation and testing of medical gas and vacuum systems shall conform to Table 1224.4.6.1 and NFPA 99.

**1224.4.6.3 Hyperbaric facilities.** The design and construction of hyperbaric facilities shall conform to NFPA 99.

**1224.4.6.4 Laboratories.** The design and construction of hospital laboratories shall conform to NFPA 99.

**1224.4.6.5 Nurse call systems.** The location of nurse call devices shall comply with Table 1224.4.6.5. The design of call systems shall comply with the California Electrical Code, Part 3 of Title 24.

#### **1224.4.7 Corridors.**

**1224.4.7.1 Width.** The minimum width of corridors and hallways shall be 8 feet (2438 mm).

**Exception:** Patient-care corridors and hallways in hospitals for psychiatric care of patients who are not bedridden shall have a minimum clear and unobstructed width of 6 feet (1829 mm). For the purposes of this section, bedridden patients shall be defined as patients confined to beds who would be transported or evacuated in beds or litters.

**1224.4.7.2 Light traffic.** Service corridors and hallways with anticipated light traffic volume for nonpatient use may be reduced to a width of 5 feet (1524 mm) if approved by the enforcing agency.

**Exception:** Corridors and hallways in administrative and business areas may be reduced to a width of 44 inches (1118 mm).

**INTERIOR ENVIRONMENT**

**TABLE 1224.4.6.1  
STATION OUTLETS FOR OXYGEN, VACUUM (SUCTION), AND MEDICAL AIR<sup>1,6</sup>**

	LOCATIONS	OXYGEN	VACUUM	MEDICAL AIR
1	Patient rooms (medical/surgical unit)	1/bed	1/bed	
2	Examination or treatment (medical/surgical unit and postpartum care)	1/room	1/room	
3	Airborne infection isolation or protective environment rooms (medical/surgical unit)	1/bed	1/bed	
4	Seclusion room (medical/surgical unit and postpartum care)	1/bed	1/bed	
5	Intensive care (general)	3/bed	3/bed	1/bed
6	Airborne infection isolation	3/bed	3/bed	1/bed
7	Coronary-care service space	3/bed	2/bed	1/bed
8	Pediatric intensive care	3/bed	3/bed	1/bed
9	Newborn intensive care	3/bassinet	3/bassinet	3/bassinet
10	Newborn nursery (full term)	1/4 bassinets <sup>2</sup>	1/4 bassinets <sup>2</sup>	1/4 bassinets <sup>2</sup>
11	Pediatric and adolescent	1/bed	1/bed	1/bed
12	Pediatric nursery	1/bassinet	1/bassinet	1/bassinet
13	Psychiatric patient room		-	
14	Seclusion treatment room			
15	General operating room	2/room	3/room	-
16	Cardio, ortho, neurological	2/room	3/room	-
17	Orthopedic surgery	2/room	3/room	
18	Surgical cysto and endo	1/room	3/room	
19	Post-anesthesia care unit	1/bed	3/bed	1/bed
20	Anesthesia workroom	1 per workstation	-	1 per workstation
21	Not used			
22	Postpartum bedroom	1/bed	1/bed	
23	Cesarean operating/delivery room	2/room	3/room	1/room
24	Infant resuscitation space <sup>4</sup>	1/bassinet	1/bassinet	1/bassinet
25	Labor room	1/room	1/room	
26	OB recovery room	1/bed	3/bed	
27	Labor/delivery/recovery (LDR) <sup>5</sup>	1/bed	1/bed	
28	Labor/delivery/recovery/postpartum (LDRP) <sup>5</sup>	1/bed	1/bed	
29	Initial emergency management	1/bed	1/bed	1/bed
30	Triage area (definitive emergency care)	1/station	1/station	
31	Definitive emergency care examination or treatment rooms	1/bed	1/bed	1/bed
32	Definitive emergency care observation unit	1/bed	1/bed	
33	Trauma/cardiac room(s)	2/bed	3/bed	1/bed
34	Orthopedic and cast room	1/room	1/room	
35	Cardiac catheterization lab	2/bed	2/bed	2/bed
36	Autopsy room		1 per workstation	-
37	MRI	1/room	1/room	1/room

1. For any area or room not described above, the facility clinical staff shall determine outlet requirements after consultation with the enforcing agency.

2. Four bassinets may share one outlet that is accessible to each bassinet.

3. Not used.

4. When infant resuscitation takes place in a room such as cesarean section/delivery or LDRP, then the infant resuscitation services must be provided in that room in addition to the minimum service required for the mother.

5. One outlet for mother and one for each bassinet.

6. Renovation projects of existing spaces where the existing function is not changed, are not required to comply with the requirements of this table.

**TABLE 1224.4.6.5**  
**[OSHPD 1, 2, 3 & 4] LOCATION OF NURSE CALL DEVICES**  
**KEY: • Required**

AREA DESIGNATION	PATIENT STATION	BATH STATION	STAFF EMERGENCY STATION	CODE CALL STATION	NURSE MASTER STATION	DUTY STATION	NOTE
<b>Nursing Units</b>							
Inpatient bed location	•	•					1, 2, 3, 4
Patient toilets, showers, and baths		•					2
Nurse/control station					•		
Clean workroom						•	
Soiled workroom						•	
Medication preparation room						•	
Examination/treatment room			•			•	
Staff lounge						•	
<b>Other Clinical Areas</b>							
Operating and cesarean delivery rooms			•				2
Procedure rooms			•				2
LDR/LDRP rooms	•		•	•			1, 2, 3, 4
Recovery—PACU			•	•			2, 4
Emergency exam, treatment, triage rooms	•		•	•			1, 2, 4
Patient preparation and holding areas	•		•				1, 2
Critical care bed locations, including NICU	•		•	•			1, 2, 4, 5
Newborn and special care nurseries			•				
Cardiac catheterization, interventional radiology, angiography			•	•			
MRI, CT, stress testing areas			•	•			2, 4
Psychiatric seclusion ante/exam rooms			•				

**Notes:**

1. One device shall be permitted to accommodate both patient station and emergency staff assistance station functionality.
2. A visible signal shall be activated in the corridor at the patient's door, at the nurse/control station, and at all duty stations. In multicorridor nursing units, additional visible signals shall be installed at corridor intersections.
3. Two way voice communication shall be provided with the nurse/control station.
4. One device shall be permitted to accommodate both emergency staff assistance and code call station functionality.
5. A patient station shall not be required in the NICU.

**1224.4.7.3 Outpatient services.** Outpatient clinics or outpatient departments which contain facilities for outpatient use only, such as laboratory, x-ray, physical therapy or occupational therapy, shall have a minimum corridor or hallway width of 5 feet (1524 mm). Outpatient clinics and outpatient departments consisting only of waiting rooms, business offices, doctor's offices, and examining rooms, where there is no traffic through such area to other services or to exits from the building, shall have a minimum corridor or hallway width of 44 inches (1118 mm).

**1224.4.7.4 Handrails.** Corridors for patient traffic in areas providing skilled nursing, intermediate care or rehabilitation services shall be furnished with a handrail on both sides at a height not less than 30 inches (762 mm) or greater than 36 inches (914 mm).

**1224.4.7.5 Connections.** Corridor systems shall connect all patient rooms and basic services.

**Exception:** Covered pedestrian walkways connecting separate buildings are permitted for ambulatory, psychiatric or chemical dependency patients.

**1224.4.8 Doors and door openings.**

**1224.4.8.1 Toilet room doors.** Doors to toilet rooms shall have an opening of not less than 32 inches (813 mm) clear in width and shall be equipped with hardware which will permit the door to swing outward or in a manner to negate the need to push against a patient who may have collapsed within the toilet room.

**1224.4.8.2 Pocket doors.** Pocket sliding doors are not permitted.

**Exception:** Administration and business areas.

**1224.4.9 Windows and screens.**

**1224.4.9.1 Windows.** Rooms approved for the housing of patients shall be provided with natural light by means of exterior glazed openings excluding clerestory window, obscure glass and skylights, with an area not less than one tenth of the total floor area.

**Exception:** Newborn intensive-care units shall comply with Section 1224.29.2.12 Daylight.

**1224.4.9.2 Operation and sills.** Patient room windows shall have sills not more than 36 inches (914 mm)

above the floor. If operable windows are provided that require the use of tools or keys for operation, the tools or keys shall be located at the nurses' station.

**Exception:** Window sills in intensive-care units may be 60 inches (1524 mm) above the floor.

**1224.4.9.2.1 Airborne infection isolation or protective environment rooms.** If operable windows are provided in airborne infection isolation or protective environment rooms, they shall only be operable by the use of tools or keys which shall be located at the nurses' station.

**1224.4.9.3 Psychiatric unit windows.** Safety glass or plastic glazing materials shall be used in windows in psychiatric patient areas.

**1224.4.9.4 Screens.** Windows which may be frequently left in an open position shall be provided with insect screens of 16 meshes to the inch.

**1224.4.9.5 Light and ventilation.** All portions of a building used by patients, personnel or other persons shall be provided with artificial light and a mechanically operated ventilating system as specified in the California Electrical Code and the California Mechanical Code.

#### 1224.4.10 Ceiling heights.

**1224.4.10.1 Minimum height.** The minimum height of ceilings shall be 8 feet (2438 mm).

**Exception:** Closet, toilet room and bathroom minimum ceiling heights shall not be less than 7 feet (2134 mm).

**1224.4.10.2 Minimum height with fixed ceiling equipment.** Operating rooms, emergency rooms, delivery rooms, radiographic rooms and other rooms containing ceiling-mounted, major fixed equipment or ceiling-mounted surgical light fixtures shall have ceiling heights to accommodate the equipment or fixtures and their normal movement. Suspended tracks, rails and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 7 feet (2134 mm) above the floor.

**Exception:** Mobile suspended tracks such as transverse rails for overhead patient lifts that may be moved out of the traffic path shall provide a clearance of not less than 6 feet, 8 inches (2032mm) above the floor when in use.

#### 1224.4.11 Interior finishes.

**1224.4.11.1 Floor finishes.** Floor finishes shall be smooth, waterproof and durable. Flooring surfaces shall provide smooth transitions between different floor materials. Slip-resistant flooring products shall be used for flooring surfaces in wet areas (e.g., kitchens,

shower and bath areas), ramps, stairways, entries from exterior to interior space, and other areas as determined by the functional program. Joints for floor openings for pipes, ducts and conduits shall be tightly sealed. Joints of structural elements shall be similarly sealed.

**Exception:** Upon written appropriate documented requests, the licensing agency may grant approval of the installation of carpets. See Table 1224.4.11.

**1224.4.11.1.1 Coved base.** Resilient flooring, if used in toilet and bathing rooms, shall be continuous and extend upward onto the wall at least 5 inches (127 mm) to minimize moisture infiltration. Wood bases are prohibited except in waiting areas and administration departments.

**1224.4.11.1.2 Food preparation areas.** Floors in areas used for food preparation and assembly shall be water-resistant. Floor surfaces, including tile joints, shall be resistant to food acids. Floor construction in dietary and food preparation areas shall be free of spaces that can harbor pests.

**1224.4.11.1.3 Wet cleaning.** In all areas subject to frequent wet-cleaning methods, flooring materials shall not be physically affected by germicidal or other types of cleaning solutions.

**1224.4.11.1.4 Airborne infection isolation, airborne infection exam/treatment and protective environment rooms.** These rooms and anterooms shall have seamless flooring with integral coved base.

#### 1224.4.11.2 Wall bases.

**1224.4.11.2.1 Material.** The material and textures of bases and the installation thereof shall be such as to minimize dust-catching surfaces, moisture, infiltration and the harboring of vermin.

**Exception:** In locations where carpet is permitted as a floor finish material, the use of carpeted base (coved or strip base) up to a maximum height of 5 inches (127mm) is also permissible.

**1224.4.11.2.2 Wet cleaning.** Floors and wall bases in operating rooms, delivery rooms, emergency operating rooms, cast rooms, interventional rooms and special procedure rooms shall be monolithic and constructed without joints. The floors and wall bases of kitchens, soiled and clean utility rooms, housekeeping rooms with mop sinks, patient, public and staff sanitary facilities and other areas subject to frequent wet cleaning, shall also be homogeneous, but may have tightly sealed joints and shall be constructed without voids at the intersection of floor and wall surfaces.

**TABLE 1224.4.11  
ACCEPTABLE CEILING AND CARPET LOCATIONS**

AREAS/ROOMS <sup>3,4</sup>	GENERAL ACUTE CARE HOSPITAL CEILING/CARPET	ACUTE PSYCHIATRIC HOSPITAL CEILING/CARPET	SKILLED NURSING AND INTERMEDIATE-CARE FACILITIES CEILING/CARPET	CLINIC CEILING/CARPET
Patient bedrooms	3	*	3	*
Patient corridors/hallways	3	*	3	*
Airborne infection isolation rooms	2	N	2	N
Protective environment rooms	1	N	1	N
Nurses' or administration station	3	Y	3	Y
Utility rooms	2	N	2	N
Surgical units <sup>2</sup>	2	N	-	2
Operation rooms	1	N	-	1
Surgical corridors/hallways	2	N	-	2
Recovery	3	N	-	3
Radiological unit <sup>2</sup>	3	*	3	-
X ray rooms <sup>1</sup>	3	N	3	N
Treatment rooms <sup>2</sup>	2	N	3	N
Examination rooms	3	*	3	*
Administration	4	Y	4	Y
Central sterile supply	2	N	2	N
Clinical laboratories	3	N	3	N
Pharmacy	3	*	3	*
Morgue and autopsy	3	N	-	-
General storage rooms	3	N	3	N
Housekeeping rooms	2	N	2	N
Laundry	I <sup>5</sup>	N	I <sup>5</sup>	N
Soiled linen	2	N	3	N
Clean linen	3	N	3	N
Kitchens	I <sup>5</sup>	N	I <sup>5</sup>	N
Dining rooms	3	*	3	*
Dishwasher rooms	2	N	2	N
Dietary day storage	2	N	2	N
Catheterization laboratory	1	N	-	-
Chronic dialysis	3	*	-	3
Coronary care	3	*	-	-
Dental	3	*	-	3
Hydrotherapy	2	N	2	N
Intensive-care nursery	3	*	-	-
Intensive care	3	*	-	-
Occupational therapy	3	*	3	*
Obstetrical unit <sup>2</sup>	3	*	-	-
Delivery rooms	1	N	-	-
Labor rooms, LDRP and LDR	3	N	-	-
Nurseries	3	N	-	-
Physical therapy	3	*	3	*
Radiation therapy	3	*	-	3
Speech pathology and audiology	3	Y	3	Y

**Ceilings:**

1 Continuous monolithic surface equal in smoothness to enamel plaster.

2 Smooth and easily cleanable without perforations or fissures.

3 Pin perforated, fine fissured, or lightly textured.

4 Any finish meeting code requirements.

**Carpets:**

Yes = Y

No = N

\* Upon approval by the licensing agency with adequate maintenance procedure. However, should the carpet not be maintained adequately, the licensing agency has the right to have it removed and replaced with another acceptable material.

**Footnotes:**

1. Carpet permitted in mammography.

2. Except those rooms specified otherwise.

3. For rooms not listed, contact the Office of Statewide Health Planning and Development (OSHPD).

4. Table applies to new construction, additions, remodels, and conversions. The patching and replacement of existing materials will be permitted.

5. Lay-in ceiling meeting the requirements of Section 1224.4.11.4.1.7 may be substituted in laundry and kitchens.

**1224.4.11.3 Wall finishes.** Wall finishes shall comply with the following requirements:

1. Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth, scrubbable and water-resistant.
2. Wall finishes in areas such as operating rooms, delivery rooms and trauma rooms shall be monolithic, scrubbable and able to withstand cleaning with chemicals.
3. Wall finishes in operating rooms, cesarean delivery rooms, isolation rooms and sterile processing rooms shall be free of fissures, open joints or crevices that may retain or permit passage of dirt particles.
4. Wall finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms and minor surgical procedure rooms shall be washable, smooth and able to withstand cleaning with chemicals.
5. Wall areas penetrated by pipes, ducts and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.
6. Wall finish requirements of Section 1224.4.11.3 do not apply to boiler rooms, mechanical equipment rooms, administration departments, other offices, enclosed stairways, maintenance shops and similar spaces.

**1224.4.11.3.1 Dietary and food preparation areas.** Dietary and food preparation areas shall comply with the following requirements:

1. In dietary and food preparation areas, wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of spaces that can harbor insects and rodents.
2. Wall surfaces in wet areas (e.g., kitchens, environmental services closets) shall be monolithic and all seams shall be covered and/or sealed.

**1224.4.11.4 Ceilings.** Ceilings in areas occupied by patients and the public shall be cleanable with the use of routine housekeeping equipment. Acoustic and lay-in ceiling, where used, shall not create ledges or crevices.

**1224.4.11.4.1 Ceiling finishes.** Ceiling finishes shall comply with Table 1224.4.11 and the following requirements:

**Semirestricted areas:**

1. Ceiling finishes in semirestricted areas such as airborne infection isolation exam/treatment rooms, surgical corridors, central sterile supply spaces and minor surgical procedure rooms, shall be nonabsorptive, nonperforated, capable of withstanding cleaning with chemicals, and without crev-

ices that can harbor mold and bacterial growth.

2. If a lay-in ceiling is provided in semi-restricted areas, it shall be gasketed or each ceiling tile shall weigh at least one pound per square foot to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, regular, serrated cut or highly textured tiles are not acceptable.

**Restricted areas:**

3. Ceilings in restricted areas shall be monolithic with no cracks or perforations.
4. Ceilings in restricted areas shall be scrubbable and able to withstand cleaning and/or disinfecting chemicals.
5. All access openings in restricted area ceilings shall be gasketed.

**Dietary and laundry areas:**

6. Provide either a sealed monolithic and scrubbable gypsum board ceiling or a lay-in ceiling.
7. If a lay-in ceiling is provided, it shall include the following:
  - a) A rust-free grid.
  - b) Ceiling tiles that weigh at least one pound per square foot and are smooth, scrubbable, nonabsorptive, nonperforated and able to withstand cleaning with chemicals.
8. Ceiling finish requirements of Section 1224.4.11.4.1 do not apply to boiler rooms, mechanical equipment rooms, administration departments, other offices, enclosed stairways, maintenance shops and similar spaces.

**1224.4.12 Courts.** Where one or more walls of a court contain a door or window of one or more patients' bedrooms, the least dimension of the court shall be 20 feet (6096 mm) between facing structures.

**1224.4.13 Elevators.**

**1224.4.13.1 Patient.** Patient elevators shall have minimum inside platform dimensions of 5 feet by 8 feet (1524 mm by 2438 mm), and a minimum clear door opening of 4 feet 0 inches (1219 mm).

**1224.4.13.2 Passenger.** Passenger elevators shall have minimum inside platform dimensions of 4 feet 8 inches by 7 feet 4 inches (1422 mm by 2236 mm).

**1224.4.13.3 Patient services.** Buildings over one story in height with accommodations or services for patients on floors without grade-level entrance shall provide at least one patient elevator.

**1224.4.13.4 Low patient capacity.** If bed patients are accommodated on one or more floors, other than the

main entrance floor or where operating rooms or delivery rooms are above or below the main entrance floor, at least one patient elevator shall be provided.

**1224.4.13.5 Medium patient capacity.** At least one patient elevator and one service elevator shall be provided in hospitals with a capacity of from 60 to 149 beds on floors other than the main entrance floor.

**1224.4.13.6 High patient capacity.** At least one patient elevator, one passenger elevator and one service elevator shall be provided in hospitals with a capacity of 150 or more beds on floors other than the main entrance floor.

**1224.4.14 Garbage, solid waste and trash storage.** Rooms or screening enclosures shall be provided for the washing and cleaning of garbage containers and for the storage of garbage, trash and other solid wastes. Such rooms or screening enclosures shall include the following:

1. A concrete floor with a curb and with a drain connected to the sewer.
2. Steam or hot-water and cold-water supply.
3. A minimum floor area of  $\frac{1}{2}$  square foot ( $0.046 \text{ m}^2$ ) per bed, but not less than 25 square feet ( $2.3 \text{ m}^2$ ), the least dimension of which shall be 4 feet (1219 mm).
4. A method of limiting access to the material except by authorized persons.

**1224.4.15 Housekeeping room.** This room shall be a minimum floor area of 15 square feet ( $1.4 \text{ m}^2$ ). It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

**1224.4.16 Laundry and trash chutes.** Gravity-type laundry and trash chutes shall have a minimum diameter of 2 feet (610 mm) and shall be designed to prevent distribution of airborne contaminating elements to all floors served.

**1224.4.17 Telephone.** Each floor accommodating patients shall have a telephone installed for patient use. Such telephones shall be readily accessible to patients who are limited to wheel chairs and stretchers. This may not be required in separate buildings having six or fewer beds which are restricted to occupancy by ambulatory patients.

**1224.4.18 Grab bars.** Each toilet, bathtub and shower serving patients shall have conveniently placed grab bars that shall comply with Chapter 11B.

**Exception:** Excluding facilities designed for use by persons with disabilities, grab bars may be deleted from those facilities serving chemical dependency recovery and psychiatric patients.

#### 1224.5 NOISE CONTROL.

**1224.5.1 Impact noises.** Recreation rooms, exercise rooms, equipment rooms and similar spaces where impact noises may be generated, shall not be located directly over patient bed areas or delivery and operating suites, unless special provisions are made to minimize such noise.

**1224.5.2 Noise reduction.** The noise reduction criteria shown in Table 1224.5 shall apply to partitions, floors, and ceiling construction in patient areas.

**TABLE 1224.5  
SOUND TRANSMISSION LIMITATIONS  
IN ACUTE CARE GENERAL HOSPITALS**

NEW CONSTRUCTION	AIRBORNE SOUND TRANSMISSION CLASS (STC) <sup>1</sup>	
	Partitions	Floors
Patient room to patient room	45	40
Public space to patient room <sup>3</sup>	55	40
Service areas to patient room <sup>4</sup>	65	45
Patient room access corridor <sup>5</sup>	45	45
Exam room to exam room	45	
Exam room to public space	45	
Toilet room to public space	45	
Consultation rooms/conference rooms to public space	45	
Consultation rooms/conference rooms to patient rooms	45	
Staff lounges to patient rooms	45	

1. Sound Transmission Class (STC) shall be determined by tests in accordance with methods set forth in ASTM 90 and ASTM 413. Where partitions do not extend to the structure above, sound transmission through ceilings and composite STC performance shall be considered.
2. Treatment rooms shall be treated the same as patient rooms.
3. Public space includes corridors (except patient room access corridors), lobbies, dining rooms, recreation rooms, and similar space.
4. Service areas for the purposes of this table include kitchens, elevators, elevator machine rooms, laundries, garages, maintenance rooms, boiler and mechanical equipment rooms, and similar spaces of high noise. Mechanical equipment located on the same floor or above patient rooms, offices, nurses stations, and similar occupied space shall be effectively isolated from the floor.
5. Patient room access corridors contain composite walls with doors/windows and have direct access to patient rooms.
6. Renovation projects of existing spaces where the existing function is not changed, are not required to comply with the requirements of Table 1224.5.

#### BASIC SERVICES

##### 1224.6 Reserved

##### 1224.7 Reserved

##### 1224.8 Reserved

##### 1224.9 Reserved

##### 1224.10 Reserved

##### 1224.11 Reserved

##### 1224.12 Reserved

##### 1224.13 Reserved

#### 1224.14 NURSING SERVICE SPACE.

##### 1224.14.1 Patient rooms.

**1224.14.1.1 Capacity.** No patient room shall be designed to accommodate more than eight beds.

**1224.14.1.2 Space requirements.** In new construction, patient rooms shall have a minimum of 100 square feet ( $9.29 \text{ m}^2$ ) of clear floor area per bed in multiple-bed rooms and 120 square feet ( $11.15 \text{ m}^2$ ) of clear floor area for single-bed rooms. The dimensions and arrangement of rooms shall be such that there is a minimum of 3 feet (914 mm) between the sides and foot of the bed and any wall or any other fixed obstruction. In multiple-bed

rooms, a minimum clearance of 3 feet (914 mm) shall be provided between beds and a clearance of 4 feet (1219 mm) shall be available at the foot of each bed to permit the passage of equipment and beds

**Exceptions:**

1. Where renovation of existing patient rooms is undertaken in facilities built under the 2001 or prior California Building Code, patient rooms shall have no less than 80 square feet (7.43 m<sup>2</sup>) of clear floor area per bed in multiple-bed rooms and 110 square feet (10.22 m<sup>2</sup>) of clear floor area in single-bed rooms.
2. For shelled spaces built under the 2001 or prior California Building Code, patient rooms shall have no less than 80 square feet (7.43 m<sup>2</sup>) of clear floor area per bed in multiple-bed rooms and 110 square feet (10.22 m<sup>2</sup>) of clear floor area in single-bed rooms.

**1224.14.1.3 Windows.** Each patient room shall have a window in accordance with Section 1224.4.9.

**1224.14.1.4 Arrangement.** Patient rooms shall not be designed to permit the placement of beds more than three deep from the exterior window, but shall be of such shape and dimensions to allow for the performance of routine functions, including the easy transfer of patients to and from bed to wheelchair or wheeled gurney.

**1224.14.1.5 Outside exposure.** All patient bedrooms shall have an outside exposure and shall not be below ground level.

**1224.14.1.6 Handwashing fixtures.** A handwashing fixture shall be provided in the patient room. Water spouts used shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc. In multiple-bed rooms the handwashing fixture shall be located outside of the patient's cubicle curtain so that it is accessible to staff. Where renovation of patient rooms is undertaken a handwashing fixture shall be located in the toilet room or patient room.

**1224.14.1.7 Toilet room.** Each patient shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a lavatory and the door shall swing outward or be double acting. Unless located in a toilet room, bedpan-washing fixtures shall be installed in dedicated rooms, separate from patient care areas.

**1224.14.1.8 Patient storage.** Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

**1224.14.1.9 Privacy.** A method of assuring visual privacy for each patient shall be maintained in patient rooms and in tub, shower and toilet rooms. Windows or doors within a normal sightline that would permit observation into the room shall be arranged or curtained as necessary for patient privacy. In multiple-bed

rooms, visual privacy from casual observation by other patients and visitors shall be provided for each patient. The design for privacy shall not restrict patient access to the entrance, lavatory, or toilet room.

**1224.14.1.10 Grab bars.** Grab bars shall be installed in accordance with Section 1224.4.18.

**1224.14.1.11 Room identification.** Each patient room shall be labeled with an identification number, letter or combination of the two.

**1224.14.2 Service areas.** Unless otherwise indicated, provision for the services listed below shall be in or readily available to each nursing unit. The size and location of each service area will depend upon the numbers and types of beds served. Identifiable spaces are required for each of the indicated functions. Each service area may be arranged and located to serve more than one nursing unit but, unless noted otherwise, at least one such service area shall be provided on each nursing floor. Where the words "room" or "offices" are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be specific space in another room or common area.

**1224.14.2.1 Administrative center(s) or nurse station(s).** This area shall have space for counters and storage and shall have convenient access to handwashing fixtures. It may be combined with or include centers for reception, charting and communication.

**1224.14.2.2 Nurse or supervisor office.**

**1224.14.2.3 Toilet room(s) conveniently located for staff use.**

**1224.14.2.4 Multipurpose room(s) for staff, patients, patients' families for patient conferences, reports, education, training sessions, and consultation.** These rooms must be accessible to each nursing unit. They may be on other floors if convenient for regular use. One such room may serve several nursing units and/or departments.

**1224.14.2.5 Examination or treatment room(s).** Examination or treatment rooms are optional. If provided, provision shall be made to preserve patient privacy from observation from outside the exam room through an open door.

**1224.14.2.6 Clean utility room.** If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility or holding rooms shall be separated and have no direct connection.

**1224.14.2.7 Soiled workroom or soiled holding room.** This room shall be separate from the clean utility room. The soiled workroom utilities room shall contain a clinical sink (or equivalent flushing-rim fixture). The room shall contain a handwashing fixture. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate cov-

ered containers for soiled linen and waste. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

**1224.14.2.8 Medication station.** Provision shall be made for distribution of medications. This shall be done from a medicine preparation room or from a self-contained medicine dispensing unit.

**1224.14.2.8.1 Medicine preparation room.** If provided, this room shall be directly accessible from the nursing station. It shall contain a work counter, handwashing fixture, refrigerator, and locked storage for controlled drugs. When a medicine preparation room is to be used to store one or more self-contained medicine dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine dispensing unit(s) present.

**1224.14.2.8.2 Self-contained medicine dispensing unit.** If provided, a self-contained medicine dispensing unit shall be located at the nurses' station, in the clean utility room, or in an alcove.

**1224.14.2.9 Clean linen storage.** Each nursing unit shall contain a designated area for clean linen storage. This may be within the clean utility room or a separate closet.

**1224.14.2.10 Nourishment area.** There shall be a nourishment area with sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishment between scheduled meals. The nourishment area shall include space for trays and dishes used for nonscheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at mealtime. Handwashing fixtures separate from the nourishment sink shall be in or adjacent to the nourishment area.

**1224.14.2.11 Ice machine.** Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice making equipment may be in the clean utility room/holding room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing icemakers.

**1224.14.2.12 Equipment storage room.** Appropriate room(s) shall be provided for storage of equipment necessary for patient care. Each unit shall provide not less than 10 square feet ( $0.93\text{ m}^2$ ) per patient bed.

**1224.14.2.13 Gurneys and wheelchairs.** Provide a storage room or alcove for gurneys and wheelchairs which shall be a minimum of 15 square feet ( $1.39\text{ m}^2$ ).

**1224.14.2.14 Showers and bathtubs.** When individual bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each 12 beds without such facilities. Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. Special bathing facilities, including space for atten-

dant, shall be provided for patients on gurneys, carts, and wheelchairs at the ratio of one per 100 beds or a fraction thereof. This may be on a separate floor if convenient for use.

**1224.14.2.15 Patient toilet room(s),** in addition to those serving bed areas, shall be conveniently located to multipurpose room(s) and within or directly accessible to each central bathing facility.

**1224.14.2.16 Emergency equipment storage.** Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a cardiopulmonary resuscitation (CPR) cart. This space shall be directly accessible from the nursing station, but out of normal traffic.

**1224.14.2.17 Housekeeping room.**

**1224.14.2.18 Grab bars.** Grab bars shall be installed in accordance with Section 1224.4.18.

#### 1224.14.3 Airborne infection isolation rooms.

**1224.14.3.1 General.** Single rooms shall be provided for the isolation of patients with airborne communicable disease at a ratio of one room for each 35 licensed beds, or major fraction thereof. At least one airborne infection isolation room shall be provided. Airborne infection isolation rooms shall be labeled with the words "Airborne Infection Room" on or adjacent to the anteroom side of the door between the isolation room and the anteroom.

##### Exceptions:

1. Acute psychiatric hospitals shall provide airborne infection isolation rooms at the ratio of one room for each 50 beds, or major fraction thereof.
2. Airborne infection isolation rooms are not required for chemical dependency recovery services.

**1224.14.3.2 Anteroom doors.** Airborne infection isolation room(s) shall have self-closing and latching devices on all anteroom doors.

**1224.14.3.3 Anteroom.** A separate anteroom shall be provided between the airborne infection isolation room and the corridor, which shall constitute the primary entrance to the airborne infection isolation room. This anteroom shall have a handwashing fixture, work counter at least 3 feet (914 mm) long, cabinets and space to gown and to store clean and soiled materials. There shall be a view window from the anteroom to the isolation room and means to allow for airflow from the anteroom into the airborne infection isolation room. Doors shall be aligned to allow large equipment to be wheeled into the airborne infection isolation room unless a secondary door complying with Section 1224.14.3.2 is provided. One anteroom may serve no more than two airborne infection isolation rooms.

**1224.14.3.4 Secondary entry.** When a secondary entry is provided, the secondary doors shall be provided with locking devices which are readily operable from the room side and which are readily operable by the facil-

ity staff on the other side. When key locks are used on isolation rooms, keys shall be located at the nurses' station in a prominent readily accessible location.

**1224.14.3.5 Sealed-tight room.** Airborne infection isolation room perimeter walls, ceilings, floors, doors, and penetrations shall be sealed tightly to minimize air infiltration from the outside or from other spaces.

**1224.14.3.6 Adjoining toilet room.** Each isolation room shall have its own adjoining toilet room with an emergency nurse call system, a lavatory, a shower providing a seat or a space for a shower chair and a toilet equipped with a bedpan flushing attachment with a vacuum breaker.

#### 1224.14.4 Protective environment room(s).

**1224.14.4.1 General.** Protective environment rooms for the protection of certain immunosuppressed patients may be provided by the facility. Protective environment rooms shall be labeled "Protective Environment Room" on or adjacent to the anteroom side of the door between the isolation room and the anteroom. Protective environment rooms shall contain only one bed.

**1224.14.4.2 Anteroom doors.** Protective environment room(s) shall have self-closing and latching devices on all anteroom doors.

**1224.14.4.3 Anteroom.** A separate anteroom shall be provided between the protective environment room and the corridor, hallway or adjoining space which shall constitute the only entrance to the protective environment room. This anteroom shall have a handwashing fixture, work counter at least 3 feet (914 mm) long, cabinets and space to gown and to store clean and soiled materials. There shall be a view window from the anteroom to the protective environment room. There shall be means to allow for airflow from the protective environment room into the anteroom. Anteroom doors shall be aligned so that large equipment can be wheeled into the protective environment room. One anteroom may serve no more than one protective environment room.

**Exception:** Alternate designs for protective environment rooms, without individual anterooms, may be approved by the enforcement agency when it can be demonstrated that the alternate design meets the requirements of the California Mechanical Code and does not compromise or alter any health or fire protection component, assembly or system.

**1224.14.4.4 Adjoining toilet room.** Room shall meet the requirements of Section 1224.14.3.6.

**1224.14.4.5 Sealed-tight room.** Protective environment room perimeter walls, ceiling, floors, doors, and penetrations shall be sealed tightly to minimize air infiltration from the outside or from other spaces.

**1224.14.5 Seclusion room(s).** If provided, the hospital shall provide one or more single bedrooms for patients needing close supervision for medical and/or psychiatric care. This may be part of the psychiatric unit described in Section 1224.31. If the single bedroom(s)

is part of the acute-care nursing unit, the provisions of Section 1224.14.1 shall apply, with the following exceptions: each room shall be for single occupancy; each shall be located to permit staff observation of the entrance, preferably adjacent to the nurses' station; and each shall be designed to minimize the potential for escape, hiding, injury or suicide. If vision panels are used for observation of patients, the arrangement shall insure patient privacy and prevent casual observation by visitors and other patients.

**1224.15 Surgical service space.** A minimum of one operating room and one recovery bed is required. The surgical service space shall be located and arranged to prevent nonrelated traffic through the service space.

An operating room suite design with a sterile core shall provide for no cross traffic of staff and supplies from the decontaminated/soiled areas to the sterile/clean areas. The use of facilities outside the operating room for soiled/decontaminated processing and clean assembly and sterile processing shall be designed to move the flow of goods and personnel from dirty to clean/sterile without compromising universal precautions or aseptic techniques in both departments.

**Exception:** Surgical service space is not required in a rural general acute care hospital, if the hospital maintains written transfer agreements with one or more general acute care hospitals that provide surgical and anesthesia services. Written transfer agreements shall be approved by the Department of Public Health, Licensing and Certification.

#### 1224.15.1 Surgery.

**1224.15.1.1 General operating room(s).** In new construction, each room shall have a minimum clear floor area of 400 square feet ( $37.16\text{ m}^2$ ) with a minimum of 20 feet (6096 mm) clear dimension between fixed cabinets and built-in shelves; and a system for emergency communication with the surgical service space control station. X-ray or imaging viewing capabilities shall be provided.

**Exception:**

1. Where renovation of existing operating rooms is undertaken in facilities built under the 2001 or prior California Building Code, each operating room shall have a minimum clear floor area of 324 square feet ( $30.10\text{ m}^2$ ) with a minimum of 18 feet (5486 mm) clear dimension between fixed cabinets and built-in shelves.
2. For shelled floor spaces built under the 2001 or prior California Building Code, each existing operating room shall have a minimum clear floor area of 324 square feet ( $30.10\text{ m}^2$ ) with a minimum of 18 feet (5486 mm) clear dimension between fixed cabinets and built-in shelves.

**1224.15.1.2 Surgical cystoscopic and other endo-urologic procedures.** In new construction each room shall have a minimum clear floor area of 250 square feet

( $23.23\text{ m}^2$ ) with a minimum of 15 feet (4572 mm) clear dimension between fixed cabinets and built-in shelves. X-ray viewing capability shall be provided.

**Exception:**

1. Where renovation of operating rooms is undertaken in facilities built under the 2001 or prior California Building Code rooms for surgical cystoscopy shall have a minimum clear floor area of 180 square feet ( $16.72\text{ m}^2$ ). Cast rooms for open reductions, if provided, shall have a minimum clear floor area of 180 square feet ( $16.72\text{ m}^2$ ), no dimension of which shall be less than 11 feet (3353 mm).
2. For shelled spaces built under the 2001 or prior California Building Code, each surgical cystoscopy shall have a minimum clear floor area of 180 square feet ( $16.72\text{ m}^2$ ). Cast rooms for open reductions, if provided, shall have a minimum floor area of 180 square feet ( $16.72\text{ m}^2$ ), no dimension of which shall be less than 11 feet (3353 mm).

**1224.15.2 Preoperative patient holding area(s).** In facilities with two or more operating rooms, area(s) shall be provided to accommodate gurney patients or sitting space for ambulatory patients not requiring gurneys. These area(s) shall be under the direct visual control of the nursing staff and may be part of the recovery service space. Each gurney station shall be a minimum clear floor area of 80 square feet ( $7.43\text{ m}^2$ ) and shall have a minimum clearance of 3 feet (914 mm) on the sides of the gurneys and the foot of the gurney. Provisions for patient privacy such as cubicle curtains shall be made.

**1224.15.3 Service areas.** Services, except for the enclosed soiled workroom referenced in Section 1224.15.3.7 and the housekeeping room referenced in Section 1224.15.3.12, may be shared with the obstetrical facilities. Service areas, when shared with delivery rooms, shall be designed to avoid the passing of patients or staff between the operating room and the delivery room areas. The following shall be provided in support of the surgical service space:

**1224.15.3.1 Control station.** Control stations shall be located to permit visual observation of all traffic into the surgical service space.

**1224.15.3.2 Supervisor's office or station.**

**1224.15.3.3 Sub-sterile areas.** If provided, a sub-sterile area(s) shall be equipped with a flash sterilizer, warming cabinet, and handwashing fixture. If a sterilizing facility(ies) with high-speed sterilizer(s) or other sterilizing equipment for immediate or emergency use are provided, they shall be grouped to service several operating rooms for convenient, efficient use; and a work space and handwashing fixture shall be included. Other facilities for processing and sterilizing reusable instruments, etc., may be located in another hospital department such as central services.

**1224.15.3.4 Medication station.** Shall be provided in accordance with Section 1224.14.2.8.

**1224.15.3.5 Scrub facilities.** Scrub sinks shall be located outside of sterile areas. A minimum of two scrub sinks shall be provided in a surgical unit containing one operating room. Four scrub sinks shall be provided in surgical units containing two operating rooms. One additional scrub sink shall be provided for each additional operating room. Scrub sinks shall have water supply controls not requiring direct contact of the hands for operation.

**1224.15.3.6 Clock.** A direct-wired or battery-operated clock or other equivalent timing device shall be visible from the scrub-up sinks.

**1224.15.3.7 Soiled workroom.** An enclosed soiled workroom (or soiled holding room that is part of a system for the collection and disposal of soiled material) for the exclusive use of the surgical service space shall be provided. The soiled workroom shall contain a flushing-rim clinical sink or equivalent flushing-rim fixture, a handwashing fixture, a work counter, and space for waste receptacles and soiled linen receptacles. Rooms used only for temporary holding of soiled material may omit the flushing-rim clinical sink and work counters. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided. The room shall not have direct connection with operating rooms. Soiled and clean utility room or holding rooms shall be separated. The soiled workroom shall provide 24 square feet ( $2.23\text{ m}^2$ ) per operating room up to eight operating rooms and shall have a minimum area of 48 square feet ( $4.46\text{ m}^2$ ), with no dimension less than 6 feet (1829 mm).

**1224.15.3.8 Clean utility room.** This room shall not be used for food preparation.

A clean utility room is required when clean materials are assembled within the surgical service space prior to use or following the decontamination cycle. It shall contain a work counter, a handwashing fixture, storage facilities for clean supplies, and a space to package reusable items. The storage for sterile supplies must be separated from this space. If the room is used only for storage and holding as part of a system for distribution of clean supply materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility rooms or holding rooms shall be separated.

**1224.15.3.9 Anesthesia workroom.** Provide an anesthesia workroom for cleaning, testing and storing anesthesia equipment. This room shall contain work counter(s) and sink(s) and racks for cylinders.

**1224.15.3.10 Equipment storage room(s)** for equipment and supplies used in surgical service space. Each surgical service space shall provide sufficient storage area to keep its required corridor width free of equipment and supplies, but not less than 150 square feet ( $13.94\text{ m}^2$ ) or 50 square feet ( $4.65\text{ m}^2$ ) per operating room, whichever is greater.

**1224.15.3.11 Staff clothing change areas.** Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses and doctors) working within the surgical service space. The areas shall con-

tain lockers, showers, toilets, lavatories equipped for handwashing, and space for donning surgical attire. These areas shall be arranged to encourage a one-way traffic pattern so that personnel entering from outside the surgical service space can change and move directly into the surgical service space.

**1224.15.3.12 Housekeeping room.** Shall be provided for the exclusive use of the surgical service space. It shall be directly accessible from the service space.

#### 1224.16 ANESTHESIA SERVICE SPACE.

**1224.16.1 Post-anesthetic care units (PACUs).** Each PACU shall contain a medication station in accordance with Section 1224.14.2.8; handwashing fixtures; nurse control with charting facilities; clinical sink, refrigerator, provisions for bedpan cleaning; and storage space for gurneys, supplies, and equipment. Additionally, the design shall provide a minimum of 80 square feet ( $7.43 \text{ m}^2$ ) for each patient position with a clearance of at least 5 feet (1524 mm) between patient gurneys and a minimum of 4 feet (1218 mm) between the sides and the foot of patient gurneys and adjacent walls or any other fixed obstructions. Provisions for patient privacy such as cubicle curtains shall be made. In new construction, at least one door to the recovery room shall access directly from the surgical service space without crossing public corridors. Handwashing fixtures shall be provided with at least one for every four gurneys uniformly distributed to provide equal access from each patient gurney.

**Exception:** In a rural general acute care hospital, when the surgical service space is not provided, the anesthesia service space is not required. The hospital must maintain written transfer agreements with one or more general acute care hospitals that provide surgical and anesthesia services. Written transfer agreements shall be approved by the Department of Public Health, Licensing and Certification.

#### 1224.17 CLINICAL LABORATORY SERVICE SPACE.

**1224.17.1 General requirements.** All hospitals shall provide space and equipment to perform urinalysis, complete blood counts, hemoglobin blood typing and cross matching. If laboratory facilities for bacteriological, serological, pathological and additional hematological procedures are not available in the community, then space, equipment and supplies for such procedures shall be provided. The following physical facilities shall be provided:

1. Laboratory work space.
2. Refrigerated blood storage facilities for transfusions shall be provided. Blood storage refrigerator shall be equipped with temperature-monitoring and alarm signals that are monitored continuously.
3. Handwashing fixture.

#### 1224.18 RADIOLOGICAL/DIAGNOSTIC IMAGING SERVICE SPACE.

**1224.18.1 Minimum requirements.** Hospital shall provide a minimum of:

1. One fluoroscopy room, which can also provide x-ray examination services.

2. Space for processing images.
3. A toilet room adjoining each fluoroscopy room, in addition to other toilet room facilities located adjacent to or in the immediate vicinity.
4. An office or other suitable area for viewing and reporting radiographic examination.
5. Storage spaces for all image equipment, supplies and copies of reports.
6. Handwashing fixtures located within the unit.
7. Dressing room facilities.

**1224.18.1.1 Radiation protection.** A certified physicist or other qualified expert shall specify the type, location, and amount of radiation protection to be installed in accordance with the final approved department layout and equipment selections. Where protected alcoves with view windows are required, a minimum of 1'-6" (0.45 meter) between the view window and the outside partition edge shall be provided. Radiation protection requirements shall be incorporated into the construction documents and comply with Chapter 31C and the requirements of California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, and Subchapter 4.

**1224.18.2 Angiography.** If provided, diagnostic angiography space shall accommodate the following:

1. A control room with a view window to permit full view of the patient.
2. A scrub sink located outside the staff entry to the procedure room.
3. Patient holding area shall accommodate at least one patient gurney with a minimum of 3-foot (914 mm) clearance on the long side.
4. Storage for portable equipment and catheters shall be provided.

**1224.18.2.1 Interventional angiography procedures.** If interventional angiography procedures are to be performed in the angiography room, the suite must comply with general operating room requirements in Section 1224.15.1.1 and have the support of the service areas in Section 1224.15.3. If cardiac catheterization procedures are performed refer to Section 1224.28.

**1224.18.3 Computerized tomography (CT) scanning.** If provided, CT space shall accommodate the following:

**1224.18.3.1 Spaces required.** If provided, CT scan spaces shall accommodate the equipment with a minimum of 3 feet (914 mm) on all sides of the equipment, together with the following:

1. A control room shall be provided that is designed to accommodate the computer and other controls for the equipment. A view window shall be provided to permit view of the patient.
2. A patient toilet room convenient to the procedure room.

**1224.18.4 Magnetic resonance imaging (MRI).** If provided, the MRI room shall accommodate the equipment

with a minimum of 3 feet (914 mm) on all sides of the equipment, together with the following:

1. A control room shall be provided with full view of the patient in the MRI scanner. The control console shall be positioned so the operator has a full view of the approach and entrance to the MRI scanner room.
2. An anteroom or area visible from the control room shall be located outside the MRI scanner room so that patients, health care personnel, and other employees must pass through it before entering the scanning area and control room. The room or area shall be outside the restricted areas of the MRI's magnetic field.
3. A computer room shall be provided.

**1224.18.4.1 Hand-washing station.** Hand-washing station(s) shall be provided convenient to the MRI scanner room, but need not be within the room.

**1224.18.4.2 Wall, floor, and ceiling assemblies.** Wall, floor, and ceiling assemblies shall accommodate the installation of required radio frequency (RF)-shielded assemblies. All doors, windows, and penetrations into the RF-shielded enclosure shall be RF-shielded. As well as RF shielding, individual sites may also require magnetic shielding on some or all surfaces to contain portions of the magnetic field not contained by the RF shield.

**1224.18.4.3 Lighted sign.** MRI rooms shall be clearly marked with a red light and lighted sign stating, "The Magnet Is On". This light and sign are to be lighted at all times and have a backup energy source to remain illuminated for at least 24 hours in the event of a loss of power.

**1224.18.4.4 Magnetic field strength identification.** Facilities shall use finishes or markings to identify the critical values of the magnetic field surrounding the MRI scanner, including the 5-gauss exclusion zone or other magnetic field strength values that may impair the operation of equipment.

**1224.18.4.5 Special ventilation requirements.** Where superconducting MRI scanners are installed, an insulated cryogen quench exhaust pipe as well as room exhaust and pressure equalization shall be provided to protect occupants in the event of a cryogen breach.

**1224.18.5 Ultrasound.** When provided, the ultrasound room shall comply with the following:

#### **1224.18.5.1 Space requirements.**

1. Area. Rooms used for ultrasound examination/treatment shall have a minimum clear floor area of 120 square feet ( $11.15 \text{ m}^2$ ).
2. Clearances. A minimum clear dimension of 3 feet (914 mm) shall be provided on three sides of the table/stretcher.

**1224.18.5.2 Handwashing fixture.** A handwashing fixture shall be provided within the procedure room.

**1224.18.5.3 Patient toilet(s).** A patient toilet shall be directly accessible to the ultrasound procedure room.

The patient toilet may be permitted to serve more than one ultrasound procedure room.

**1224.18.6 Mammography.** When provided, the mammography room shall comply with the following:

#### **1224.18.6.1 Space requirements.**

1. Area. Mammography rooms shall be a minimum of 100 square feet ( $9.3 \text{ m}^2$ ).
2. Shielded alcove. Each x-ray room shall include a shielded control alcove. For mammography machines with built-in shielding for the operator, omission of the alcove shall be permitted when approved by the certified physicist.

**1224.18.6.2 Handwashing fixture.** A handwashing fixture shall be provided within the procedure room.

**1224.18.7 Support spaces.** The following spaces are common to the imaging service area and are minimum requirements unless stated otherwise:

**1224.18.7.1 Patient's toilet room(s).** In service spaces with procedure rooms that do not have dedicated patient toilets, provide a minimum of one patient toilet room within the service space.

**1224.18.7.2 Patient dressing rooms.** Dressing rooms shall be provided convenient to the imaging rooms.

**1224.18.7.3 Staff facilities.** In service space of three or more procedure rooms, staff toilet room(s) internal to the service space shall be provided.

**1224.18.7.4 Film storage (active).** If film systems are used, provide the following:

1. A room with cabinet or shelves for filing patient film for immediate retrieval shall be provided.
2. Storage facilities for unexposed film which shall include protection of film against exposure or damage.

**1224.18.7.5 Locked storage.** Provision shall be made for locked storage of medications and drugs.

### **1224.19 PHARMACEUTICAL SERVICE SPACE**

**1224.19.1 Licensed pharmacy.** All hospitals having a licensed capacity of 100 or more beds shall have a pharmacy on the premises licensed by the California Board of Pharmacy.

**Note:** See General Acute Care Hospitals §70263(a), Article 3, Chapter 1, Division 5, Title 22, California Code of Regulations, for requirements concerning hospitals with fewer than 100 beds. The pharmacy room or service space shall conform to the requirements of § 1751, Article 7, Division 17, Title 16, California Code of Regulations as enforced by the California Board of Pharmacy.

**1224.19.1.1 Handwashing fixture.** Handwashing fixture(s) shall be provided within each separate room where open medication is handled, or in an anteroom, or immediately outside the room where open medication is handled, still within the pharmaceutical service space.

**Exception:** ISO Class 5 sterile preparation areas (e.g., chemotherapy and intravenous solutions) and

*their ISO Class 7 buffer area(s) shall not contain sources of water (sinks) or floor drains. However the anteroom to the buffer area shall have a hand-washing fixture regardless of its intended ISO Classification (i.e. Class 7 or Class 8). Reference: U.S. Pharmacopeia (USP) 797 Pharmaceutical Compounding – Sterile Preparations.*

**1224.19.1.2 Location.** Provide for convenient access to toilet room and locker.

#### 1224.20 DIETETIC SERVICE SPACE

**1224.20.1 General.** Food service facilities and equipment shall conform to these standards, the standards of the National Sanitation Foundation and the requirements of the local public health agency.

**1224.20.2 Functional elements.** On-site conventional food service preparation shall be provided as follows in the size and number appropriate for the type of food service selected:

**1224.20.2.1 Location.** Patient food preparation areas shall be directly accessible to the entry for food supply deliveries and for the removal of kitchen wastes, interior transportation, storage, etc., without traversing patient or public circulation. Food preparation, service and storage shall be inaccessible to nondietetic service staff.

**1224.20.2.2 Receiving/control stations.** Provide an area for the receiving and control of incoming dietary supplies.

##### 1224.20.2.3 Storage.

- Food storage space shall be convenient to the receiving area and shall be located to exclude traffic through the food preparation area to reach them. Storage spaces for bulk, refrigerated, and frozen foods shall be provided. At least one week's (7 days) supply of staple foods and at least two (2) days' supply of frozen, and two (2) days' supply of perishable foods shall be maintained on the premises. Food storage components shall be grouped for convenient access from receiving and to the food preparation areas. All food shall be stored clear of the floor. Lowest shelf shall be not less than 12 inches (305 mm) above the floor or shall be closed in and sealed tight for ease of cleaning.

*As a minimum, dietary storage space shall be provided in accordance with the following schedule:*

Licensed Bed Capacity	Storage Space
1 to 99 beds	2 square feet (0.19 m <sup>2</sup> ) per bed
100 to 199 beds	200 square feet (18.58 m <sup>2</sup> ) plus 1 square foot 0.0929 m <sup>2</sup> ) per bed in excess of 100 beds

200 beds and over	<i>300 square feet (27.99 m<sup>2</sup>), plus 1/2 square foot (0.0465 m<sup>2</sup>) per bed in excess of 200 beds</i>
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*Space to allow refrigeration for the storage of frozen and chilled foods shall be provided at a minimum of 2 cubic feet (0.057 m<sup>3</sup>) of usable space per bed.*

- Additional storage space for dietetic service supplies, such as paper products, equipment, tray delivery carts, etc., shall be provided.
- Storage areas and sanitizing facilities for cans, carts and mobile-tray conveyors shall be provided.
- Waste storage and recycling facilities (per local requirements) shall be located in a separate room easily accessible to the outside for direct pickup or disposal.

**1224.20.2.4 Cleaning supplies storage.** Provide a separate storage room for the storage of nonfood items such as cleaning supplies that might contaminate edibles.

**1224.20.2.5 Food preparation workspaces.** Provide workspaces for food preparation, cooking, and baking. These areas shall be as close as possible to the user (i.e. tray assembly and dining). Provide additional spaces for thawing and portioning.

**1224.20.2.6 Assembly and distribution.** Provide a patient tray assembly area and locate within close proximity to the food preparation and distribution areas.

**1224.20.2.7 Food service carts.** A cart distribution system shall be provided with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. The cart traffic shall be designed to eliminate any danger of cross-circulation between outgoing food carts and incoming soiled carts, and the cleaning and sanitizing process. Cart circulation shall not be through food preparation areas.

**1224.20.2.8 Dining area.** Provide dining space(s) for ambulatory patients, staff, and visitors. These spaces shall be separate from the food preparation and distribution areas.

**1224.20.2.9 Vending services.** If vending devices are used for unscheduled meals, provide a separate room that can be accessed without having to enter the main dining area.

**1224.20.2.10 Ware-washing facilities.** Ware-washing space shall be provided in a room separate from food preparation and serving areas. It shall be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares shall be transferred for storage or use in the dining room area without having to pass through food preparation areas.

- Commercial-type ware-washing equipment shall be provided.

2. Space shall be provided for receiving, scraping, sorting and stacking soiled tableware separate from food preparation areas.
3. Convenient handwashing stations shall be provided in the ware-washing space.

**1224.20.2.11 Pot washing facilities.** Pot washing shall include multi-compartmented sinks.

**1224.20.2.12 Waste storage room.** A food waste storage room shall be conveniently located to the food preparation and ware washing areas but not within the food preparation area. It shall have direct access to the hospital's waste collection and disposal facilities.

**1224.20.2.13 Handwashing fixtures.** Handwashing fixtures shall be located conveniently accessible at locations throughout the unit.

**1224.20.2.14 Office space.** Office or other space shall be provided for the dietician or dietetic service supervisor.

**1224.20.2.15 Toilet room(s) and locker spaces.** Toilet rooms shall be provided for the exclusive use of the dietary staff. They shall not open directly into the food preparation areas, but shall be in close proximity to them. An enclosed, separate locker area shall be provided for dietetic service employee's clothing and personal belongings.

**1224.20.2.16 Housekeeping room.** A housekeeping room, meeting the requirements of Section 1224.4.15, shall be provided within the dietary department for the exclusive use of the dietary department.

**1224.20.3 Outside service.** On approval of the Licensing Agency, when food is provided by an outside food service, all applicable licensing and certification requirements shall be met. The facility shall maintain adequate space, equipment and food supplies to accommodate required functional elements listed in Section 1224.20.2, as required to provide patient food service in the event that outside food service is interrupted.

## SUPPORT SERVICES

### 1224.21 ADMINISTRATIVE SPACE.

**1224.21.1 Administration.** An administration area shall be provided which shall provide for the following functions:

1. A lobby with reception and information counter or desk, waiting space, men's and women's public toilet room facilities, telephones and drinking fountain.
2. Offices for administrator and admitting.

**1224.21.2 Records.** Hospitals shall provide a health record service which shall accommodate the following functions:

1. Work area for sorting and recording records for either paper or electronic media.

2. Storage area for records for either paper or electronic media.

### 1224.22 CENTRAL STERILE SUPPLY.

**1224.22.1 Minimum requirements.** A central supply and sterilizing area shall be provided. Rooms and spaces shall accommodate the following services and equipment:

1. **Soiled work area.** A receiving and gross cleaning area which shall contain work space and equipment for cleaning medical and surgical equipment and for disposal of or processing of soiled material.
2. **Clean work area.** A clean work area which shall contain work space and equipment for sterilizing medical and surgical equipment and supplies.
3. **Sterilizing space.**
4. **Storage.** Provide storage space for sterile supplies and unsterile supplies.

**Exception:** Section 1224.22.1 does not apply to hospitals which serve psychiatric or alcoholism patients exclusively.

**1224.22.2** All sterilizers and autoclaves which emit steam exhaust shall be vented to the outside of the building. Such vents shall be independent from the plumbing vent system.

**Exception:** Small instrument sterilizers.

### 1224.23 STORAGE.

**1224.23.1 General storage.** Hospitals shall provide general storage space of at least 20 square feet ( $1.86 \text{ m}^2$ ) per bed in addition to specialized storage spaces. All storage spaces shall be readily accessible on the site of the facility.

**1224.23.2 Specialized storage.** Specialized storage spaces shall include the following:

**1224.23.2.1 Linen.** Provide separate and enclosed facilities for clean and soiled linen in each nursing unit. The clean linen storage space shall have a minimum area of 10 square feet ( $0.93 \text{ m}^2$ ) and may be within the clean utility room. The soiled linen collection space shall have an area of no less than 10 square feet ( $0.93 \text{ m}^2$ ), except where linen chutes are provided, and may be within the soiled utility room.

**1224.23.2.2 Supply.** One supply storage space having a minimum area of 15 square feet ( $1.39 \text{ m}^2$ ) shall be provided in each nursing unit. Supply storage may be within the clean utility room used only as part of a system for distributing clean and sterile supplies.

**1224.23.2.3 Wheelchairs.** A room or space shall be provided in each nursing unit for wheelchairs and gurneys. The wheelchair and gurney space shall have a minimum area of 15 square feet ( $1.39 \text{ m}^2$ ).

**1224.23.2.4 Sterile and unsterile supplies** shall be stored separately.

**1224.23.2.5 Food storage** shall be as described in Section 1224.20.

**1224.24 MORGUE AND AUTOPSY FACILITIES.**

**1224.24.1** General acute-care hospitals with a licensed bed capacity of 50 or more beds shall provide a morgue with autopsy facilities.

**Exception:** This may not be required if it can be demonstrated to the licensing agency that morgue and autopsy facilities are available locally.

**1224.24.2 Minimum requirements.** The morgue and autopsy space shall have a minimum of 250 square feet ( $23.23 \text{ m}^2$ ) of floor area, no dimension of which shall be less than 10 feet (3048 mm), and provide for:

1. Handwashing fixture.
2. Space for refrigerated compartments if human remains are held unembalmed. Refrigerated rooms and prefabricated body refrigerator temperatures shall not be higher than 45°F (25°C).

**1224.25 EMPLOYEE DRESSING ROOMS AND LOCKERS.**

**1224.25.1 Minimum facilities.** Hospitals shall provide the following:

1. Separate dressing rooms for male and female personnel with lockers, lavatory and toilet.
2. Additional dressing rooms for the surgical service and as required within any of the supplemental services.

**1224.26 HOUSEKEEPING ROOMS.** Shall be provided to serve each department and nursing unit, and may be shared by compatible departments, except when specifically required by other sections.

**1224.27 LAUNDRY.**

**1224.27.1** If a laundry is to be provided, the following is required in addition to the laundry room:

1. A separate soiled linen receiving, holding and sorting room with handwashing fixture.
2. A separate clean linen storage, issuing and holding room.
3. Storage for laundry supplies.

**1224.27.2 Outside service.** If linen is processed off site, the following shall be provided within the hospital:

1. Soiled linen holding room.
2. Clean linen receiving room.
3. Clean linen storage room.

**SUPPLEMENTAL SERVICES****1224.28 SUPPLEMENTAL SURGERY SERVICES.**

**1224.28.1 Cardiovascular and other special procedures.** When provided, the cardiovascular room shall have a minimum clear floor area of 650 square feet ( $60.39 \text{ m}^2$ ), with a minimum of 20 feet (6096 mm) clear dimension. Orthopedic surgical and other special procedure rooms shall have a minimum clear floor area of 600 square feet ( $55.74 \text{ m}^2$ ), with a minimum of 20 feet (6096 mm) clear dimension. When open-heart surgery is performed, an additional room in the restricted area of the surgical ser-

vice space, preferably adjoining this operating room, shall be designated as a pump room where extra corporeal pump(s), supplies and accessories are stored and serviced. Appropriate plumbing and electrical connections shall be provided in the cardiovascular, pump, and storage rooms.

**1224.28.1.1 Service areas.** Shall be provided in accordance with Section 1224.15.3.

**Exceptions:**

1. Where renovation work is undertaken in facilities built under the 2001 or prior California Building Code, existing rooms for cardiovascular, and other special procedures may have a minimum clear floor area of 500 square feet ( $46.45 \text{ m}^2$ ). Orthopedic surgical rooms shall have a minimum clear floor area of 360 square feet ( $33.44 \text{ m}^2$ ) and a minimum dimension of 18 feet (5486 mm).
2. For shelled spaces built under the 2001 or prior California Building Code Rooms for cardiovascular, and other special procedures may have a minimum clear floor area of 500 square feet ( $46.45 \text{ m}^2$ ). Orthopedic surgical rooms shall have a minimum clear floor area of 360 square feet ( $33.44 \text{ m}^2$ ) and a minimum dimension of 18 feet (5486 mm).

**1224.28.2 Cardiac catheterization.**

**1224.28.2.1 Procedure room.** A procedure room with a minimum clear floor area of 400 square feet ( $37.16 \text{ m}^2$ ) for the procedure room in addition to spaces for control, monitoring and recording equipment, and x-ray power and controls, and a minimum of one scrub sink for each catheterization laboratory. This space does not include the control room.

**1224.28.2.2 Control room.** A control room or area shall be provided. A view window permitting full view of the patient from the control console shall be provided.

**1224.28.2.3 Equipment space.** An equipment space or enclosure large enough to contain x-ray transformers, power modules, and associated electronics and electrical gear shall be provided.

**1224.28.2.4 Scrub facilities.** Scrub facilities with hands-free operable controls shall be provided adjacent to the entrance of procedure rooms.

**1224.28.2.5 Staff clothing change areas.** Appropriate areas shall be provided for male and female staff working within the surgical service space. The areas shall contain lockers, showers, toilets, lavatories equipped for handwashing, and space for donning surgical attire. These areas shall be arranged to ensure a traffic pattern so that personnel entering from outside the service space can enter, change their clothing, and move directly into the cardiac catheterization service space. The staff change area may be combined with the surgical staff change area.

**1224.28.2.6 Patient holding.** A patient preparation, holding, and recovery area or room shall be provided and arranged to provide visual observation before and after the procedure. This may occur in a unit outside of the catheterization service space.

**1224.28.2.7 Clean utility room.** A clean utility room shall be provided. If the room is used for preparing patient care items, it shall contain a work counter and handwashing fixture. If the room is used only for storage and holding of clean and sterile supply materials, the work counter and handwashing fixtures shall be permitted to be omitted. The clean utility may be shared with an adjacent surgical unit.

**1224.28.2.8 Soiled utility room.** A soiled utility room shall be provided which shall contain a handwashing fixture and a clinical sink (or equivalent flushing rim fixtures). When the room is used for temporary holding or soiled materials, the clinical sink and handwashing fixture shall be permitted to be omitted. The soiled utility may be shared with an adjacent surgical unit.

**1224.28.2.9 Housekeeping room.** Shall be a minimum floor area of 15 square feet ( $1.4 \text{ m}^2$ ). It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment. This may be shared with an adjacent surgical unit.

**1224.28.3 Freestanding cardiac catheterization laboratory service space.** A general acute care hospital referenced in Health and Safety Code Section 1255 (d)(3)(E) may provide cardiac catheterization laboratory service in a freestanding nonhospital building in conformance with this section and Section 1226.2.2. In addition, the service space shall comply with Section 1224.28.2 and applicable requirements in Section 1224.15.3 that are not covered by this section.

**1224.28.3.1 Outpatient support areas.** Outpatient support areas shall include outpatient waiting rooms in compliance with Section 1224.4.5. A separate space shall be provided where outpatients change from street clothing and are prepared for a procedure. This space shall include provisions for clothing storage, toilet room(s), sink and an area for clothing change and gowning.

**1224.28.3.2 Connection to hospital.** The freestanding cardiac catheterization laboratory service space shall be located in the nonhospital building such that the service space has a direct connection to the general acute care hospital providing cardiac surgery by a patient corridor link in compliance with Section 1224.4.7. The corridor link shall have a minimum width of 8 feet (2438 mm) as required under Section 1224.4.7.1. The corridor link shall connect to the hospital corridor system with access to all basic services as required under Section 1224.4.7.5.

**1224.28.3.3 Control station.** Control station(s) shall be located to permit visual observation of all traffic into the semi-restricted service space from unrestricted corridors and/or passageways.

**1224.28.3.4 Essential electrical system.** Cardiac catheterization laboratories shall meet the provisions for ambulatory surgical clinics required in the California Electrical Code including the requirements of Article 517.45 for an essential electrical system.

**1224.28.3.5 Services/systems and utilities.** Services/systems and utilities that support the catheterization laboratory space include, but are not limited to: normal power; emergency power; nurse call; communication and data systems; space heating systems; cooling systems; domestic hot and cold water systems; building drain and sewer systems; and medical gas systems. When these systems serve other portions of the building, any alteration to the system shall be subject to review by the Office of Statewide Health Planning and Development.

## 1224.29 INTENSIVE CARE UNITS.

**1224.29.1 General.** The following shall apply to all types of intensive care service spaces, acute respiratory-care service spaces, burn center spaces, critical-care units, coronary-care service spaces, pediatric intensive-care service spaces unless otherwise noted. Each unit shall comply with the following provisions:

**1224.29.1.1 Service space.** Each intensive-care unit shall contain not less than four or more than 12 beds.

**Exception:** When approved by the licensing agency a small or rural hospital intensive care unit may consist of less than four but not less than two patient beds.

**1224.29.1.2 Patient space.** In new construction, each patient space (whether separate rooms, cubicles, or multiple bed space) shall have a minimum of 200 square feet ( $18.58 \text{ m}^2$ ) of clear floor area with a minimum headwall width of 13 feet (3962 mm) per bed. There shall be a minimum clear dimension of 1 foot (305 mm) clear space from the head of the bed to the wall, a minimum of 5 feet (1524 mm) clear space from the foot of the bed to the wall, a minimum of 5 feet (1524 mm) clear space on one side of each bed for patient transfer, a minimum of 4 feet (1218 mm) clear width on the non-transfer side, and a minimum of 8 feet (2438 mm) clear space between beds.

**Exceptions:**

- Where renovation of existing intensive care units is undertaken, in facilities approved under the 2001 or prior California Building Code, existing patient space (whether separate rooms, cubicles, or multiple bed space) may be renovated or replaced in kind one for one in the renovated space. Such patient space shall have no less than 132 square feet ( $12.26 \text{ m}^2$ ) with no dimension less than 11 feet (3353 mm), and with 4 feet (1219 mm) of clearance at each side and the foot of the bed, and with a minimum of 8 feet (2438 mm) between beds. The space shall be designed so that all beds shall be placed in relation to the nurse's sta-

*tion or work area to permit, enable or allow maximum observance of patients.*

2. *For shelled space approved under the 2001 or prior California Building Code as an intensive-care unit, patient space (whether separate rooms, cubicles, or multiple bed space) may be renovated or replaced in kind one for one in the renovated space. Such patient space shall have separate rooms or cubicles for single patient use no less than 132 square feet ( $12.26 \text{ m}^2$ ) with no dimension less than 11 feet (3353 mm) and with 4 feet (1219 mm) of clearance at each side and the foot of the bed, and with a minimum of 8 feet (2428 mm) between beds. The space shall be designed so that all beds shall be placed in relation to the nurses' station or work area to permit, enable or allow maximum observation of patients.*

**1224.29.1.3 Private rooms.** When private rooms or cubicles are provided, view panels to the corridor shall be required with a means to provide visual privacy. Where only one door is provided to a bed space, it shall be at least 4 feet (1219 mm) wide and arranged to minimize interference with movement of beds and large equipment. Sliding doors shall not have floor tracks. Where sliding doors are used for access to cubicles within a service space, a 3-foot-wide (914 mm) swinging door may also be provided for personnel communication.

**1224.29.1.4 Modular toilet.** Modular toilet/sink combination units located within a privacy curtain may be used within each patient space or private room. The toilet fixture shall be completely contained within cabinetry when not in use. This fixture shall not be equipped with a bedpan washing attachment. Exhaust ventilation requirements shall comply with the California Mechanical Code.

**1224.29.1.5 Visitors and visual privacy.** Each patient bed area shall have space at each bedside for visitors, and provisions for visual privacy from casual observation by other patients and visitors. For both adult and pediatric units, there shall be a minimum of 8 feet (2438 mm) between beds.

**1224.29.1.6 Outside environment.** Each patient bed shall have visual access, other than clerestory windows and skylights, to the outside environment with not less than one outside window in each patient bed area.

**1224.29.1.6.1 Distance.** The distance from the patient bed to the outside window shall not exceed 50 feet (15 240 mm). When partitioned cubicles are used, patients' view to outside windows may be through no more than two separate clear vision panels.

**1224.29.1.7 Handwashing fixtures.** Handwashing fixtures shall be convenient to nurse stations and patient bed areas. There shall be at least one handwashing fixture for every three beds in open plan areas, and one in

each patient room. The handwashing fixture shall be located near the entrance to the patient cubicle or room.

**1224.29.1.8 Administrative center or nurse station.** This area shall have space for counters and storage. It may be combined with or include centers for reception and communication.

**1224.29.1.9 Nurses' work area.** There shall be direct visual observation between either a centralized or distributed nurse station or work station and the heads of all patient beds in the intensive care unit.

**1224.29.1.10 Monitoring.** Each unit shall contain equipment for continuous monitoring. Monitors shall be located to permit easy viewing but not interfere with access to the patient.

**1224.29.1.11 Emergency equipment storage.** Space that is easily accessible to the staff shall be provided for emergency equipment such as a CPR cart.

**1224.29.1.12 Medication station.** Shall be provided in accordance with Section 1224.14.2.8.

**1224.29.1.13 Airborne infection isolation room.** At least one airborne infection isolation room shall be provided per unit. The room shall comply with the requirements of Section 1224.14.3; however, the adjoining toilet room is not required. Modular toilet units located within a privacy curtain may be used within the airborne infection isolation room. The modular toilet fixture shall comply with Section 1224.29.1.4.

**Exception:** When approved by the licensing agency an airborne infection isolation room is not required for small or rural hospitals.

**1224.29.1.14 Additional service spaces.** The following additional service spaces shall be immediately available within each intensive care service space. These may be shared by more than one intensive care unit provided that direct access is available from each.

**1224.29.1.14.1 Clean utility room.** If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility rooms or holding rooms shall be separated and have no direct connection.

**1224.29.1.14.2 Clean linen storage.** There shall be a designated area for clean linen storage. This may be within the clean utility room or a separate closet.

**1224.29.1.14.3 Soiled utility room.** Size shall be a minimum 50 square feet ( $4.65 \text{ m}^2$ ); if shared between units, it shall be a minimum of 75 square feet ( $6.97 \text{ m}^2$ ). The soiled workroom shall contain a clinical sink (or equivalent flushing-rim fixture). The room shall contain a handwashing fixture. The

above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and a variety of waste types. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

**1224.29.1.14.4 Nourishment area.** There shall be a nourishment area with sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishments between scheduled meals. The nourishment station shall include space for trays and dishes used for nonscheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at mealtime. Handwashing fixtures shall be in or immediately accessible from the nourishment area.

**1224.29.1.14.5 Ice machine.** There shall be available equipment to provide ice for treatments and nourishment. Ice-making equipment may be in the clean utility room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing icemakers.

**1224.29.1.14.6 Equipment storage room.** Appropriate room(s) shall be provided for storage of large items of equipment necessary for patient care. Each intensive care unit shall provide not less than 20 square feet ( $1.86 \text{ m}^2$ ) per patient bed.

**1224.29.1.15 Support.** The following shall be provided and shall be located immediately adjacent to the unit:

1. **Visitors' waiting room.**
2. **Office space.**
3. **Staff lounge(s) and toilet room(s).**
4. **Multipurpose room(s).** Provide for staff, patients, and patients' families for patient conferences, reports, education, training sessions, and consultation.
5. **Housekeeping room.** Provide within or immediately adjacent to the intensive care unit. It shall not be shared with other nursing units or departments.
6. **Gurney and wheelchair storage.** Provide a minimum 15 square feet (1.39 mm) per each nursing unit.

**1224.29.2 Newborn intensive care units (NICU).** The NICU shall comply with all the requirements of Section 1224.29.1. Additionally each NICU shall include or comply with the following:

**1224.29.2.1 Entrance.** The NICU shall have a clearly identified entrance and reception area for families. The area shall permit visual observation and contact with all traffic entering the unit.

**1224.29.2.2 Handwashing fixture(s).** Provide one handwashing fixture for each four infants or major

fraction thereof. In a multiple-bed room, every bed position shall be within 20 feet (6096 mm) of a handwashing fixture. Where an individual room concept is used, a handwashing fixture shall be provided within each infant care room.

**1224.29.2.3 Doors.** At least one door to each patient room shall be a minimum of 44 inches (1118 mm) wide.

**1224.29.2.4 View windows.** When viewing windows are provided, provision shall be made to control casual viewing of infants. Controls shall be provided to enable lighting to be adjusted over individual patient care spaces. Darkening sufficient for transillumination shall be available when necessary.

**1224.29.2.5 Control station.** A central area shall serve as a control station, shall have space for counters and storage, and shall have convenient access to handwashing fixture. It may be combined with or include centers for reception and communication and patient monitoring.

**1224.29.2.6 Area.** Each patient care space shall contain a minimum of 120 square feet ( $11.15 \text{ m}^2$ ) of clear floor area per bassinet excluding handwashing fixtures and aisles. There shall be an aisle for circulation adjacent to each patient care space with a minimum width of 4 feet (1219 mm).

#### Exceptions:

1. Where renovation of existing NICUs is undertaken in facilities built under the 2001 or prior California Building Code, patient care areas shall have no less than 80 square feet (7.43 m<sup>2</sup>) of clear floor area per bassinet exclusive of space for nurse control, scrubbing and gowning, and reception area.
2. For shelled spaces built under the 2001 or prior California Building Code, NICUs shall have no less than 80 square feet (7.43 m<sup>2</sup>) of clear floor area per bassinet, exclusive of space for nurse control, scrubbing and gowning, and reception area.

**1224.29.2.7 Ceilings.** Ceilings shall have a noise reduction coefficient (NRC) of at least 0.90.

**1224.29.2.8 Airborne infection isolation room.** Shall comply with the requirements of Section 1224.29.1.13 except for separate toilet, bathtubs or shower. The room shall be enclosed and separated from the nursery unit with provisions for observation of the infant from adjacent nurseries or control area(s).

**1224.29.2.9 Lactation.** Space shall be provided for lactation support and consultation in or immediately adjacent to the NICU.

**1224.29.2.10 Infant formula facilities.**

#### 1224.29.2.10.1 Location.

1. Where infant formula is prepared on site, direct access from the formula preparation room to any infant care room is prohibited.

2. The formula preparation room shall be located in or adjacent to the NICU. The formula preparation room may be located at another location as approved by the Licensing Agency.

**1224.29.2.10.2 Formula preparation room.** The formula preparation room shall include the following:

1. A separate cleanup area for washing and sanitizing. This area shall include a handwashing station, facilities for bottle washing and a work counter.
2. A separate room for preparing infant formula. This room shall contain a refrigerator, work counter, formula sterilizer, storage facilities and a handwashing station.

**1224.29.2.10.3 Refrigerated storage and warming facilities for infant formula.** Shall be accessible for use by NICU personnel at all times.

**1224.29.2.10.4 Commercial infant formula.** Where a commercial infant formula is used, omission of the separate cleanup and preparation rooms shall be permitted, and storage and handling in the NICU workroom or another appropriate room that is conveniently accessible at all hours shall be permitted. The preparation area shall have the following:

1. A work counter
2. A hand-washing station
3. Storage facilities

**1224.29.2.11 Emergency equipment storage.** Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart.

**1224.29.2.12 Housekeeping room.** Shall be directly accessible from the unit and be dedicated for the exclusive use of the neonatal intensive care unit.

**1224.29.2.13 Daylight.** At least one source of daylight shall be visible from newborn care areas.

1. External windows in infant care rooms shall be glazed with insulating glass to minimize heat gain or loss.
2. External windows in infant care rooms shall be situated at least 2 feet (60.96 centimeters) away from any part of a baby's bed to minimize radiant heat loss from the baby.
3. All external windows shall be equipped with easily cleaned shading devices that are neutral color or opaque to minimize color distortion from transmitted light.

**1224.30 PEDIATRIC AND ADOLESCENT UNIT.** A pediatric nursing unit shall be provided if the hospital has eight or more licensed pediatric beds. The unit shall meet the following standards:

**1224.30.1 Patient rooms.** Each patient room shall meet the following standards:

**1224.30.1.1 Beds.** The space requirements for pediatric patient beds shall be the same as required by Section 1224.14.1.2.

**1224.30.1.2 Windows.** Each patient room shall have a window in accordance with Section 1224.4.9.

**1224.30.2 Examination or treatment rooms.** This room shall be provided for pediatric and adolescent patients. A separate area for infant examination and treatment may be provided within the pediatric nursery workroom.

**1224.30.3 Service areas.** The service areas in the pediatric and adolescent nursing units shall conform to Section 1224.14.2 and shall also provide the following:

**1224.30.3.1 Play area.** A play area shall be provided.

**1224.30.3.2 Infant formula.** Space for preparation and storage of infant formula shall be provided within the unit or other convenient location.

**1224.30.3.3 Toilet rooms.** Patient toilet room(s) with a lavatory in each room, in addition to those serving bed areas, shall be conveniently located to play area(s) and to each central bathing facility.

**1224.30.3.4 Storage.** Closets or cabinets for toys, educational, and recreational equipment shall be provided.

**1224.30.3.5 Airborne infection isolation room.** At least one airborne infection isolation room shall be provided within each pediatric unit; minimum of one per 15 beds. Airborne infection isolation room(s) shall comply with the requirements of Section 1224.14.3.

**1224.30.3.6 Clean and soiled workrooms.** Separate clean and soiled workrooms or holding rooms shall be provided as described in Sections 1224.14.2.6 and 1224.14.2.7.

#### **1224.31 PSYCHIATRIC NURSING UNIT.**

**1224.31.1 Psychiatric unit space.** A psychiatric unit shall be housed in a separate and distinct nursing unit and shall provide the following:

**1224.31.1.1 General.** A psychiatric nursing unit shall meet the requirements of Section 1224.14.

**1224.31.1.2 Windows.** Windows modified to prevent patients from leaving the unit.

**1224.31.1.3 Access control.** Entrances and exits which may be locked if necessary.

**1224.31.1.4 Observation room(s).** Used for the observation of acutely disturbed patients. This room shall be designed to allow visual observation and be located near the nursing station and a bathroom.

**1224.31.1.5 Consultation room(s).** Used for interviewing patients.

**1224.31.1.6 Dining and recreation.** Provide spaces for dining and recreation. The total area for these purposes shall be not less than 30 square feet ( $2.8 \text{ m}^2$ ) per patient.

**1224.31.1.7 Storage.** Storage closets or cabinets for recreational and occupation therapy equipment.

**1224.31.1.8 Exam or treatment room.** A room for physical examinations and medical treatment.

**1224.31.1.9 Activity spaces.** Indoor and outdoor space for therapeutic activities.

**1224.31.1.10 Occupational therapy.** Facilities for occupational therapy shall comply with Section 1224.35.3.

**1224.31.1.11 Recreation.** A recreation room with a minimum of 100 square feet ( $9.3 \text{ m}^2$ ) in each building, and on each floor of a building accommodating six or more psychiatric patients.

**1224.31.1.12 Nurse call.** A nurses' call system is not required, but if it is included, provisions shall be made for easy removal, or for covering call button outlets.

**1224.31.1.13 Privacy.** Visual privacy in multibed rooms (e.g., cubicle curtains) is not required.

**1224.31.1.14 Tamper resistant.** The ceiling and the air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper-resistant type.

**1224.31.1.15 Toilet rooms.** Each patient room shall be provided with a private toilet room that meets the following requirements:

1. The door shall not be lockable from within.
2. The door shall be capable of swinging outward.
3. The ceiling shall be of tamper-resistant construction and the air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of the tamper-resistant type.

**1224.31.1.16 Handwashing fixtures.** Handwashing fixtures located in patient rooms and patient toilet rooms may include anti-ligature features that do not compromise compliance with the hot and cold water supply controls, laminar flow, and sink requirements of Section 210.0 and Table 4-2 of the California Plumbing Code. Handwashing fixtures within patient rooms and patient toilet rooms in psychiatric nursing units are not required to be equipped with gooseneck spouts and the discharge point may be less than 5 inches (127 mm) above the fixture rim.

**1224.31.2 Education.** If a unit treats children of school age over a period of one month or more, it shall provide physical facilities for an educational program, such as classrooms and an office for the teacher.

**1224.31.3 Service areas.** The standards noted in Section 1224.14.2 shall apply to service areas for psychiatric nursing units.

## **1224.32 OBSTETRICAL FACILITIES (PERINATAL UNIT SPACE)**

**1224.32.1 General.** The obstetrical facility, including cesarean operating room(s) and delivery room(s), shall be located and designed to prohibit nonrelated traffic through the unit.

### **1224.32.2 Antepartum and postpartum unit**

**1224.32.2.1 Patient bedrooms.** Antepartum and postpartum bedrooms shall comply with Section 1224.14.1.

**1224.32.2.2 Service areas.** Shall be provided in accordance with Section 1224.14.2 with the following additions:

1. Staff lounge.
2. Staff storage. Lockable closets or cabinets for personal articles of staff.
3. Consultation/conference room(s).

### **1224.32.3 Cesarean/delivery service space**

**1224.32.3.1 Cesarean operating room(s).** Provide a minimum clear floor area of 360 square feet ( $33.45 \text{ m}^2$ ) with a minimum dimension of 16 feet (4877 mm). There shall be a minimum of one such room.

**1224.32.3.2 Delivery room(s).** Provide a minimum clear floor area of 300 square feet ( $27.87 \text{ m}^2$ ). An emergency communication system shall be connected with the obstetrical facilities control station. There shall be a minimum of one such room.

**1224.32.3.2.1 Postpartum bed ratio.** Delivery rooms, which are used for no other purpose, shall be provided at the ratio of one per 12 postpartum beds or major fraction thereof.

#### **Exceptions:**

1. If LDR or LDRP beds are provided, each LDR or LDRP may be counted as a delivery room in the postpartum bed ratio.
2. When approved by the licensing agency, the operating room of small or rural hospitals with a licensed bed capacity of 50 or less may serve as the delivery room.

### **1224.32.3.3 Clocks.** Shall be provided as follows:

1. A direct-wired or battery-operated clock with sweep second hand and lapsed time indicators in each cesarean operating and delivery room.
2. A direct-wired or battery-operated clock or other equivalent timing device, visible from the scrub-up sinks.

**1224.32.3.4 Surgical lights.** Provide a surgical light in each cesarean operating or delivery room.

**1224.32.3.5 Infant resuscitation.** Provide within the cesarean operating rooms and delivery rooms a minimum clear floor area of 40 square feet ( $3.72 \text{ m}^2$ ) in addition to the required area of each room or may be provided in a separate but immediately accessible room with a clear floor area of 150 square feet ( $13.94 \text{ m}^2$ ). Six single or three duplex electrical outlets shall be provided for the infant in addition to the facilities required for the mother.

**1224.32.3.6 Labor room(s) (LDR or LDRP rooms may be substituted).** Where LDRs or LDRPs are not provided, a minimum of two labor beds shall be provided for each cesarean operating room. Each room shall be designed for either one or two beds with a minimum clear floor area of 120 square feet ( $11.15 \text{ m}^2$ ) per bed. Each labor room shall contain a handwashing fixture and have access to a toilet room. One toilet room may serve two labor rooms. Labor rooms shall have con-

trolled access with doors that are arranged for observation from a nursing station. At least one shower (which may be separate from the labor room if under staff control) for use of patients in labor shall be provided. Windows in labor rooms, if provided, shall be located, draped, or otherwise arranged, to preserve patient privacy from casual observation from outside the labor room.

**Exceptions:**

1. Where renovation of labor rooms is undertaken in facilities built under the 2001 or prior California Building Code, existing labor rooms shall have a minimum clear floor area of 100 square feet ( $9.29 m^2$ ) per bed.
2. For shelled spaces built under the 2001 or prior California Building Code, labor rooms shall have a minimum clear floor area of 100 square feet ( $9.29 m^2$ ) per bed.

**1224.32.3.7 Recovery room(s) (LDR or LDRP rooms may be substituted).** Each recovery room shall contain at least two beds and have a nurse control with charting facilities located to permit visual control of all beds. Each room shall include a handwashing fixture and a medication station. A clinical sink with bedpan flushing device shall be available, as shall storage for supplies and equipment. Provide visual privacy of the new family.

**1224.32.3.8 Service areas.** Individual rooms shall be provided as indicated in the following standards; otherwise, alcoves or other open spaces that do not interfere with traffic may be used.

**1224.32.3.8.1 Services.** The following services shall be provided:

1. Control/nurse station. This shall be located to restrict unauthorized traffic into the service space.
2. Soiled workroom or soiled holding room. See Section 1224.14.2.7.
3. Fluid waste disposal.

**1224.32.3.8.2 Shared services.** The following services shall be provided and may be shared with the surgical facilities. Where shared, areas shall be arranged to avoid direct traffic between the delivery and operating rooms

**1224.32.3.8.2.1 Supervisor's office or station.** Office or station shall be a minimum of 80 square feet ( $7.43 m^2$ ) and have a desk.

**1224.32.3.8.2.2 Waiting room.** This room shall have toilet room(s), telephone(s) and drinking fountain(s) conveniently located. The toilet room(s) shall contain a lavatory.

**1224.32.3.8.2.3 Drug distribution station.** Shall have a handwashing fixture and provisions for controlled storage, preparation and distribution of medication.

**1224.32.3.8.2.4 Scrub facilities for cesarean operating or delivery rooms(s).** Two positions

shall be provided adjacent to entrance to the first cesarean operating room. Provide one additional scrub sink per cesarean or delivery operating room. Scrub facilities shall be arranged to minimize any splatter on nearby personnel or supply carts. In new construction, provide view windows at scrub stations to permit the observation of room interiors.

**1224.32.3.8.2.5 Clean utility room.** A clean utility room shall be provided if clean materials are assembled within the obstetrical service space prior to use. If a clean utility room is provided see Section 1224.14.2.6.

**1224.32.3.8.2.6 Storage.**

1. Clean sterile storage area readily available to the delivery room.
2. Equipment storage room(s) for equipment and supplies used in the obstetrical service space.

**1224.32.3.8.2.7 Workroom.** An anesthesia workroom for cleaning, testing and storing anesthesia equipment. It shall contain a work counter, sink, and provisions for separation of clean and soiled items.

**1224.32.3.8.2.8 Male and female staff clothing change areas.** The clothing change area shall be designed to encourage one-way traffic and eliminate cross-traffic between clean and contaminated personnel. The area shall contain lockers, showers, toilets, handwashing fixtures, and space for donning and disposing scrub suits and booties.

**1224.32.3.8.2.9 Staff lounge.** Lounge and toilet room facilities for obstetrical staff convenient to cesarean operating room(s), delivery room(s), labor room(s) and recovery room(s). Each toilet room shall contain handwashing fixtures.

**1224.32.3.8.2.10 On-call room.** An on-call room(s) for physician and/or staff shall be provided, but may be located elsewhere in the facility.

**1224.32.3.8.2.11 Housekeeping room.**

**1224.32.4 LDR and LDRP facilities.**

**1224.32.4.1 Location.** LDR room(s) may be located in a separate LDR service space or as part of the cesarean/delivery service space. The postpartum unit may contain LDRP rooms.

**1224.32.4.2 Space requirements.** These rooms shall have a minimum of 250 square feet ( $23.23 m^2$ ) of clear floor area with a minimum dimension of 13 feet (3962 mm). There shall be space for crib and sleeping space for support person. An area within the room but distinct from the mother's area shall be provided for infant stabilization and resuscitation. The medical gas outlets shall be located in the room so that they are accessible to the mother's delivery area and infant resuscitation area.

**1224.32.4.3 Occupancy.** Each LDR or LDRP room shall be for single occupancy.

**1224.32.4.4 Shower or tub.** Each LDR or LDRP room shall have direct access to a private toilet room with shower or tub.

**1224.32.4.5 Handwashing fixtures.** Each LDR or LDRP room shall be equipped with handwashing fixtures.

#### 1224.32.5 Newborn/well baby nurseries

**1224.32.5.1 General.** Infants shall be housed in nurseries that comply with the standards below. All nurseries shall be adjacent to the postpartum unit and obstetrical facilities. The nurseries shall be located and arranged to preclude the need for unrelated pedestrian traffic. No nursery shall open directly onto another nursery. Each nursery shall contain the following:

**1224.32.5.1.1 Handwashing fixtures.** At least one handwashing fixture for each six infant bassinets.

**1224.32.5.1.2 Storage.** Storage for linens and infant supplies at each nursery room.

**1224.32.5.1.3 Lactation.** A consultation/demonstration/breast feeding or pump room shall be provided convenient to the nursery. Provision shall be made, either within the room or conveniently located nearby, for sink, counter, refrigeration and freezing, storage for pump and attachments, and educational materials. The area provided for the unit for these purposes, when conveniently located, may be shared.

**1224.32.5.1.4 Workroom(s).** Each nursery shall be served by a connecting workroom. The workroom shall contain gowning facilities at the entrance for staff and housekeeping personnel, work counter, refrigerator, storage for supplies, and a handwashing fixture. One workroom may serve more than one nursery room provided that required services are convenient to each. Adequate provision shall be made for storage of emergency cart(s) and equipment out of traffic and for the sanitary storage and disposal of soiled waste.

**1224.32.5.1.5 Housekeeping room.** A housekeeping room shall be provided for the exclusive use of the nursery unit. It shall be directly accessible from the unit.

**1224.32.5.1.6 Charting space.** Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

**1224.32.5.2 Space requirements.** Each newborn nursery room shall contain no more than 16 infant stations. Nurseries shall provide a minimum of 25 square feet ( $2.32 \text{ m}^2$ ) of floor area per bassinet, with at least 3 feet (914 mm) between bassinets and at least 6 inches (152 mm) from a wall.

#### 1224.33 EMERGENCY SERVICE

**1224.33.1 Definition.** Levels of emergency care range from initial emergency management to definitive emergency care.

**1224.33.2 Standby emergency medical service.** If provided, initial emergency management shall include:

**1224.33.2.1 Exterior entrance.** A well-marked, illuminated and covered entrance, at grade level. The emergency vehicle entry cover shall provide shelter for both the patient and the emergency medical crew during transfer from an emergency vehicle into the building. This exterior entrance shall not be substituted for the required accessible entrance protected from the weather by canopy or roof overhang assigned for passengers loading zone. Reception, triage and control station shall be located to permit staff observation and control of access to treatment area, pedestrian and ambulance entrances, and public waiting area.

**1224.33.2.2 Treatment room.** The area shall not be less than 120 square feet ( $11.15 \text{ m}^2$ ) of clear floor area, exclusive of toilet room(s), waiting area and storage. Each treatment room shall contain an examination light, work counter, handwashing fixtures, medical equipment, cabinets, medication storage and counter space for writing. The dimensions and arrangement of treatment rooms shall be such that there is a minimum of 3 feet (914 mm) between the sides and foot of the bed/gurney and any wall or any other fixed obstruction. The treatment room may have additional space and provisions for several patients with cubicle curtains for privacy. Multiple-bed treatment rooms shall provide a minimum of 80 square feet ( $7.43 \text{ m}^2$ ) per patient gurney, with a minimum 8 foot width (2,438 mm) and 3 feet (914 mm) at the foot of the bed/gurney, with a minimum of 3 feet to any wall or fixed obstruction, and a minimum of 5 feet (1524 mm) between patient gurneys. Patient gurneys shall be separated from adjoining cubicles by curtains.

#### Exceptions:

- Where renovation of existing treatment rooms is undertaken in facilities approved under the 2001 or prior California Building Code, existing treatment rooms may be renovated, or replaced in kind one for one in the renovated space. Such treatment rooms shall have no less than 80 square feet ( $7.43 \text{ m}^2$ ) of clear floor area, the least dimension of which shall be 8 feet (2438 mm).
- For shelled spaces approved under the 2001 or prior California Building Code as future emergency service space, treatment rooms shall have no less than 80 square feet ( $7.43 \text{ m}^2$ ) of clear floor area per bed, with a minimum dimension of 8 feet (2438 mm).

**1224.33.2.3 Storage.** Shall be sized for general medical/surgical emergency supplies, medications and equipment such as ventilator, defibrillator, splints, etc.

**1224.33.2.4 Lobby.** Provisions for reception, control, and public waiting, including a public toilet room(s) with handwashing fixture(s), and public telephone.

**1224.33.2.5 Toilet room(s).** Patient toilet room(s) with handwashing fixture(s) convenient to the treatment room(s).

**1224.33.2.6 Communication.** A communication hookup to the Poison Control Center and local EMS system.

**1224.33.2.7 Airborne infection isolation room.** Shall comply with the requirements of Section 1224.29.1.13 except for separate toilet room, bathtubs, or shower.

**1224.33.3 Basic emergency medical service.** When 24-hour emergency service is to be provided, at a minimum, the following shall be provided:

**1224.33.3.1 Exterior entrance.** Grade-level well-marked, illuminated, and covered entrance with direct access from public roads for ambulance and vehicle traffic conforming with the requirements of the local authorities having jurisdiction. Entrance and driveway shall be clearly marked. If a raised platform is used for ambulance discharge, provide a ramp for pedestrian and wheelchair access.

**1224.33.3.2 Patient access.** Paved emergency access to permit discharge of patients from automobiles and ambulances, and temporary parking convenient to the entrance.

**1224.33.3.3 Reception, triage, and control station(s).** This area shall be located to permit staff observation and control of access to treatment area, pedestrian and ambulance entrances, and public waiting area.

**1224.33.3.4 Wheelchair and gurney storage.** Shall be located with convenient access from emergency entrances.

**1224.33.3.5 Public waiting area with toilet room facilities, drinking fountains, and telephone.**

**1224.33.3.6. Examination or treatment room(s).** Shall have a minimum clear floor area of 120 square feet ( $11.15 \text{ m}^2$ ). The room shall contain work counter(s); cabinets; handwashing fixtures; and a vision panel adjacent to and/or in the door. The dimensions and arrangement of examination and treatment rooms shall be such that there is a minimum of 3 feet (914 mm) between the sides and foot of the bed/gurney and any wall or any other fixed obstruction. When treatment cubicles are in open multi-bed areas, each cubicle shall have a minimum of 80 square feet ( $7.43 \text{ m}^2$ ) of clear floor space with a minimum 8 foot (2438 mm) width and 3 feet (914 mm) at the foot of the bed, with a minimum of 3 feet to any wall or fixed obstruction and a minimum of 5 feet (1524 mm) between patient gurneys, and shall be separated from adjoining cubicles by curtains. Handwashing fixtures shall be provided for each four treatment cubicles or major fraction thereof in multiple-bed areas.

**Exceptions:**

1. Where renovation of existing examination or treatment room(s) is undertaken in facilities approved under the 2001 or prior California

*Building Code, existing examination or treatment rooms may be renovated, or replaced in kind one for one in the renovated space. Such examination or treatment rooms shall have no less than 80 square feet ( $7.43 \text{ m}^2$ ) of clear floor area per examination or treatment room, the least dimension of which shall be 8 feet (2438 mm).*

2. For shelled spaces approved under the 2001 or prior California Building Code as future Emergency Service space, examination or treatment room(s) shall have no less than 80 square feet ( $7.43 \text{ m}^2$ ) of clear floor area, the least dimension of which shall be 8 feet (2438 mm).

**1224.33.3.7 Trauma/cardiac rooms.** These rooms are for emergency procedures, including emergency surgery, and shall have at least 250 square feet ( $23.23 \text{ m}^2$ ) of clear floor space. Each room shall have cabinets and emergency supply shelves, image viewing capability, examination lights, and counter space for writing. Additional space with cubicle curtains for privacy may be provided to accommodate more than one patient at a time in the trauma room. There shall be storage provided for immediate access to attire used for universal precautions. Doors leading from the ambulance entrance to the cardiac trauma room shall have an opening with a minimum width of 5 feet (1524 mm).

**1224.33.3.8 Orthopedic and cast work.** Provisions may be made in separate room(s) or in the trauma room. They shall include storage for splints and other orthopedic supplies, traction hooks, image viewing capability, and examination lights. If a sink is used for the disposal of plaster of paris, a plaster trap shall be provided. The clear floor space for this area shall be a minimum of 180 square feet ( $16.7 \text{ m}^2$ ).

**1224.33.3.9 Poison Control Center and EMS communications center.** May be a part of the staff work and charting area.

**1224.33.3.10 Emergency equipment storage space.**

**1224.33.3.11 Patients' toilet room.** Where there are more than eight treatment areas, a minimum of two toilet rooms, with a lavatory in each toilet room, shall be required.

**1224.33.3.12 Storage.** Provide rooms for clean, soiled or used supplies.

**1224.33.3.12.1 Soiled workroom or soiled holding room.** See Section 1224.14.2.7. This room is for the exclusive use of the emergency service.

**1224.33.3.12.2 Clean utility room.** See Section 1224.14.2.6.

**1224.33.3.13 Administrative center or nurses' station for staff work and charting.** These areas shall have space for counters, cabinets, and medication storage, and shall have convenient access to handwashing fixtures. They may be combined with or include centers for reception and communication.

**1224.33.3.14 Staff lounge.**

**1224.33.3.15 Housekeeping room.** A housekeeping room shall be directly accessible from the unit.

**1224.33.3.16 Airborne infection isolation room.** If provided shall comply with the requirements of Section 1224.29.1.13 except for separate toilet room, bathtubs or shower.

**1224.33.3.17 Secured holding room.** If provided, shall have at least one holding/seclusion room of 120 square feet ( $11.15\text{ m}^2$ ). This room shall allow for security, patient and staff safety, patient observation and sound-proofing.

**1224.33.4 Other space considerations**

**1224.33.4.1 Observation units.** If provided shall have the following:

1. Handwashing fixtures shall be provided for each four treatment cubicles or major fraction thereof. Handwashing fixtures shall be convenient to nurse stations and patient bed areas.
2. Each patient bed area shall have space at each bedside for visitors and provision for visual privacy from casual observation by other patients and visitors.
3. One toilet room shall be provided for each eight treatment cubicles or major fraction thereof.
4. A sink, work counter, refrigerator, storage cabinets.

**1224.34 NUCLEAR MEDICINE**

**1224.34.1 General.** If nuclear medicine is provided, the following shall be provided:

**1224.34.1.1 Radiation protection.** A certified physicist shall specify the type, location and amount of radiation protection to be installed in accordance with final approved department layout and equipment selection. Radiation protection requirements shall be incorporated into the construction documents and comply with Chapter 31C and the requirements of California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, and Subchapter 4.

**1224.34.1.2 Nuclear medicine room.** Sized to accommodate the equipment and a gurney. Provide a handwashing fixture.

**1224.34.1.3 Radiopharmacy.** If radiopharmaceutical preparation is performed, an area adequate to house a radiopharmacy shall be provided with appropriate shielding. This area shall include adequate space for storage of radionuclides, chemicals for preparation, dose calibrators, and record keeping. If preprepared materials are used, storage and calculation area may be considerably smaller than that for on-site preparation. Space shall provide adequately for dose calibration, quality assurance, and record keeping. The area may still require shielding from other portions of the facilities.

**1224.34.2 Support areas for nuclear medicine services.**

Nuclear medicine area when operated separately from the imaging department shall provide the following:

**1224.34.2.1 Entrance.** Space shall be adequate to permit entry of gurneys, beds, and able to accommodate imaging equipment, electronic consoles, and if present, computer terminals.

**1224.34.2.2 Cleanup.** Provisions for cleanup shall be located within the service space for convenient access and use. It shall include service sink or floor receptacle as well as storage space for equipment and supplies.

**1224.34.2.3 Consultation.** A consultation area may be provided.

**1224.34.2.4 Waiting.** Waiting areas shall be provided out of traffic, under staff control. If the department is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening or visual privacy between the waiting areas.

**1224.34.2.5 Dose administration area.** Provide and locate near the preparation area. Since as much as several hours may elapse for the dose to take effect, the area shall provide for visual privacy from other areas.

**1224.34.2.6 Holding.** A holding area for patients on gurneys or beds shall be provided out of traffic and under control of staff and may be combined with the dose administration area with visual privacy between the areas.

**1224.34.2.7 Patient dressing rooms.** Located convenient to the waiting area and procedure rooms. Each dressing room shall include a seat or bench, a mirror, and provisions for hanging patients' clothing and for securing valuables.

**1224.34.2.8 Patient toilet room(s).** Reserved for nuclear medicine patients and shall be located convenient to waiting and procedure rooms.

**1224.34.2.9 Staff toilet rooms(s).** Shall be located convenient to the nuclear medicine laboratory.

**1224.34.2.10 Handwashing fixtures.** Shall be located within each procedure room.

**1224.34.2.11 Control desk and reception.**

**1224.34.2.12 Storage area for clean linen.**

**1224.34.2.13 Soiled and contaminated material.** Provisions with handwashing fixtures shall be made for holding soiled material. Separate provisions shall be made for holding contaminated material.

**1224.34.3 Radiotherapy service space.**

**1224.34.3.1 Radiation therapy space.** If radiation therapy is provided, the following shall be accommodated:

1. Patient reception and waiting areas.
2. Space for medical and physics staff functions.
3. Space for equipment and supplies.
4. Housekeeping room.

5. Direct access to or space provided for radiation measurement and calibration equipment, including a calibration constancy instrument and access to a secondary standard dose meter.
  - 5.1. A megavoltage treatment unit capable of delivering x-rays or gamma rays of effective energy 500 KeV or more and conforming to the requirements of Chapter 31C and the California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 4.
  - 5.2. Access to a medium voltage or superficial treatment unit delivering 500 KeV or less, but otherwise having the same functional characteristics as the above mega-voltage units and conforming to the requirements of Chapter 31C and the California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 4.
  - 5.3. Direct access to or space provided for brachytherapy equipment which shall meet the requirements of Chapter 31C and the California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 4.
  - 5.4. Shielding of the rooms shall meet the requirements of Chapter 31C and the California Radiation Control Regulations. California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 4.

**1224.34.3.2 Radiation protection.** Cobalt, linear accelerators, hot lab and high dose rate brachytherapy rooms and simulation rooms require radiation protection. All rooms that provide radiation treatment shall be appropriately shielded. A certified physicist shall specify the type, location, and amount of protection to be installed in accordance with final approved department layout and equipment selection. Radiation protection requirements shall be incorporated into the construction documents and comply with Chapter 31C and the requirements of California Radiation Control Regulations, California Code of Regulations, Title 17, Division 1, Chapter 5, and Subchapter 4.

**1224.34.3.3 Room sizes.** Rooms shall be sized as follows:

1. Cobalt rooms and linear accelerators shall be sized in accordance with equipment requirements and shall accommodate a gurney for litter borne patients. Layouts shall provide for preventing the escape of radioactive particles. Openings into the room, including doors, ductwork, vents and electrical raceways and conduits, shall be baffled to prevent direct exposure to other areas of the facility.
2. Simulator, accelerator and cobalt rooms shall be sized to accommodate the equipment with patient

access on a gurney, medical staff access to the equipment and patient, and service access.

**1224.34.3.4 General support area.** The following areas shall be provided:

1. A gurney hold area adjacent to the treatment rooms, screened for privacy, and combined with a seating area for outpatients.
2. Exam or treatment room shall be provided with a minimum of 100 square feet ( $9.29 m^2$ ) with a minimum dimension of 8 feet (2438 mm). Each exam room shall be equipped with a handwashing fixture.

**Exceptions:**

1. Where renovation of existing treatment rooms is undertaken in facilities built under the 2001 or prior California Building Code, treatment rooms shall have no less than 80 square feet ( $7.43 m^2$ ) of clear floor area.
2. For shelled spaces built under the 2001 or prior California Building Code, treatment rooms shall have no less than 80 square feet ( $7.43 m^2$ ) of clear floor area per bed.
3. Darkroom is optional. If provided, shall be convenient to the treatment room(s)
4. Patient gowning area with provision for safe storage of valuables and clothing and with direct access to toilet room(s). At least one space shall be large enough for staff-assisted dressing.
5. Film files area is optional. If provided shall have storage for unprocessed film.

**1224.34.4 Additional support areas for linear accelerator.**

**1224.34.4.1 Mold room with exhaust hood and hand-washing fixture.**

**1224.34.4.2 Block room with storage.** The block room may be combined with the mold room.

**1224.34.5 Additional support areas for cobalt room.**

**1224.34.5.1 Hot lab.**

**1224.34.6 High dose rate brachytherapy room.**

**1224.35 REHABILITATION THERAPY DEPARTMENT.**

**1224.35.1 Rehabilitation center space.** If provided, a rehabilitation center space shall be designed to meet the requirements of Section 1224.14, except as follows:

1. Patient bedrooms shall contain a minimum of 110 square feet ( $10.22 m^2$ ) of clear floor area per bed, exclusive of toilet room(s), closets, lockers, wardrobes, alcoves or vestibules, with greater space provided for special needs such as circ-o-electric beds.
2. Space for group dining shall be provided at the minimum rate of 20 square feet ( $1.86 m^2$ ) per bed.

3. Space for group recreation or patient's lounge shall be provided at the minimum rate of 20 square feet ( $1.86 \text{ m}^2$ ) per bed.
4. Space for staff conferences, patient evaluation, and progress reports.
5. A classroom space.
6. An examination and treatment room, adjacent or directly accessible to an office for the physician in charge of the outpatient service.
7. A patient waiting area with access to telephone, drinking fountain, and men's and women's toilet room facilities in or adjacent to the rehabilitation outpatient service area.
8. Access to an outside area to be used for therapeutic procedures for patients.
9. At least one training toilet room in each patient unit with minimum dimensions of 5 feet by 6 feet (1524 mm by 1829 mm).
10. Patient bathtubs, where provided, of standard height and located to provide access to both sides and one end of the tub.
11. Patient showers, where provided in centralized bathing facilities, shall comply with Section 11B-608.2.2, no dimension of which shall be less than 4 feet (1219 mm), be equipped with handrails, privacy curtains, and designed for ease of accessibility. The floor shall be sloped to provide drainage.

**1224.35.2 Physical therapy service space.** If physical therapy is part of the service, the following shall be included:

1. Individual treatment area(s) with privacy screens or curtains. Each such space shall have not less than 70 square feet ( $6.51 \text{ m}^2$ ) of clear floor area.
2. Handwashing fixtures for staff either within or at each treatment space. (One handwashing fixture may serve several treatment stations.)
3. Exercise area and facilities.
4. Clean linen and towel storage.
5. Storage for equipment and supplies.
6. Separate storage for soiled linen, towels, and supplies.

**Exception:** When approved by the licensing agency small or rural hospitals are exempt from Sections 1224.35.2.1 through 1224.35.2.6.

**1224.35.3 Occupational therapy service space.** If this service is provided, the following shall be included:

1. Work areas and counters suitable for wheelchair access.
2. Handwashing fixture(s).
3. Storage for supplies and equipment.
4. An area for teaching daily living activities shall be provided. It shall contain an area for a bed, kitchen

counter with appliances and sink, bathroom, and a table/chair.

**1224.35.4 Speech pathology and/or audiology service space.** If a speech pathology service is provided, space shall be provided for:

1. Tables and chairs to conduct interviews, consultations and treatment, and to accommodate patients in wheelchairs and stretchers.
2. A waiting area with access to public toilet room(s) if outpatients are being served.
3. Handwashing fixture.
4. Testing unit. If an audiology service is provided, there shall be, in addition to Items 1, 2 and 3 above, a minimum of one two-room testing unit that meets the American National Standards Institute, ANSI/ASA S-3.1, 1999, (2008) Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms.

#### **1224.36 RENAL DIALYSIS SERVICE SPACE (ACUTE AND CHRONIC)**

**1224.36.1 General.** If provided, renal dialysis service shall comply with the following:

##### **1224.36.2 Treatment area.**

**1224.36.2.1 Location.** The treatment area may be an open area and shall be separate from administrative and waiting areas.

**1224.36.2.2 Nurses' station(s).** Shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

**1224.36.2.3 Individual patient treatment areas.** Shall contain at least 80 square feet ( $7.44 \text{ m}^2$ ). There shall be at least a 4-foot (1219 mm) space around and between beds and/or lounge chairs.

**1224.36.2.4 Handwashing fixtures.** Shall be located convenient to the nurses' station and patient treatment areas. There shall be at least one handwashing fixture serving no more than four stations. These shall be uniformly distributed to provide equal access from each patient station.

**1224.36.2.5 Privacy.** The open unit shall be designed to provide privacy for each patient.

**1224.36.2.6 Bloodborne infection isolation room.** A minimum of one bloodborne infection isolation room of at least 120 square feet ( $11.15 \text{ m}^2$ ) of clear floor space shall be provided for patients. This room shall contain a counter and handwashing fixture.

**1224.36.2.7 Medication dispensing.** If provided, there shall be a medication dispensing station for the dialysis center. A work counter and handwashing fixtures shall be included in this area. Provisions shall be made for the controlled storage, preparation, distribution and refrigeration of medications.

**1224.36.2.8 Home training.** If provided in the unit, a private treatment area of at least 120 square feet ( $11.15 \text{ m}^2$ ) shall be provided for patients who are being

*trained to use dialysis equipment at home. This room shall contain counter, handwashing fixtures, and a separate drain for fluid disposal.*

**1224.36.2.9 Examination room.** An examination room with a handwashing fixture shall be provided with at least 100 square feet ( $9.29 m^2$ ).

**1224.36.2.10 Clean utility room.** A clean utility room shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility rooms or holding rooms shall be separated and have no direct connection.

**1224.36.2.11 Soiled utility room.** A soiled workroom shall be provided and contain a sink, handwashing fixture, work counter, storage cabinets, waste receptacles and a soiled linen receptacle.

**1224.36.2.12 Reprocessing room.** If dialyzers are reused, a reprocessing room is required and sized to perform the functions required and include one-way flow of materials from soiled to clean with provisions for a refrigerator (temporary storage or dialyzer), decontamination/cleaning areas, sinks, processors, computer processors and label printers, packaging area and dialyzer storage and disinfectants cabinets.

**1224.36.2.13 Nourishment station.** If a nourishment station for the dialysis service is provided, the nourishment station shall contain a sink, a work counter, a refrigerator, storage cabinets and equipment for serving nourishments as required.

**1224.36.2.14 Housekeeping room.** Provide adjacent to and for the exclusive use of the unit.

**1224.36.2.15 Repair room.** If required, an equipment repair and breakdown room shall be equipped with a handwashing fixture, deep service sink, work counter and storage cabinet. Needs water supply and drain connection for testing machines.

**1224.36.2.16 Supplies.** Supply areas or supply carts shall be provided.

**1224.36.2.17 Storage.** Storage space shall be available for wheelchairs and gurneys, if gurneys are provided, out of direct line of traffic.

**1224.36.2.18 Clean linen storage.** A clean linen storage area shall be provided. This may be within the clean utility room, a separate closet, or an approved distribution system. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

**1224.36.2.19 Mixing room.** Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring

*special dialysis solutions. The mixing room shall also include a sink, storage space and holding tanks.*

**1224.36.2.20 Water treatment room.** The water treatment equipment shall be located in an enclosed room.

**1224.36.2.21 Patient toilet.** A patient toilet room with a lavatory shall be provided.

### 1224.36.3 Ancillary facilities.

**1224.36.3.1 Staff lounge, lockers and toilet(s).** Space shall be available for male and female personnel for staff clothing change area and lounge. The areas shall contain lockers, shower, toilet(s), and handwashing fixtures.

**1224.36.3.2 Patient storage.** Storage for patients' belongings shall be provided.

**1224.36.3.3 Waiting room.** A waiting room, toilet room(s) with handwashing fixtures, drinking fountain, public telephone, and seating accommodations for waiting periods shall be available or accessible to the dialysis unit.

**1224.36.3.4 Administrative services.** Provide office and clinical work space.

**1224.37 RESPIRATORY THERAPY SERVICE SPACE.** If respiratory service is provided, the following elements shall be included:

1. **Storage for equipment and supplies.**

2. **Space and utilities for cleaning and disinfecting equipment.** Provide physical separation of the space for receiving and cleaning soiled materials from the space for storage of clean equipment and supplies. Appropriate local exhaust ventilation shall be provided if gluteraldehyde or other noxious disinfectants are used in the cleaning process. This space may be co-located with other reprocessing functions within the hospital.

3. **Additional facilities.** If respiratory services such as testing and demonstration for outpatients are part of the program, additional facilities and equipment shall be provided including but not limited to:

3.1. **Patient waiting.**

3.2. **A reception and control station.**

**1224.38 INTERMEDIATE-CARE SERVICE SPACE.** An intermediate-care service unit shall be housed in a separate and distinct nursing unit and shall comply with the applicable requirements of Section 1225.

### 1224.39 OUTPATIENT SERVICE SPACE.

**1224.39.1 Waiting area(s).** Provide with access to public toilet room facilities, a public telephone and a drinking fountain. These facilities may be shared with other services.

**1224.39.2 Outpatient surgery.** If out patient surgery is performed in the out patient service area, the following shall be provided:

1. An operating room(s) with a minimum clear floor area of 270 square feet ( $25.08 m^2$ ), no dimension of which shall be less than 15 feet (4572 mm).

2. Preoperative patient holding shall be provided in accordance with Section 1224.15.2.
3. A postanesthesia recovery area which meets the requirements of Section 1224.16.
4. Each surgical unit shall provide a separate cleanup room separated from any surgical sterilizing facilities. The cleanup room shall provide 24 square feet ( $2.2 \text{ m}^2$ ) per operating room up to eight operating rooms and shall have the minimum area of 48 square feet ( $4.5 \text{ m}^2$ ), with no dimension less than 6 feet (1829 mm).
5. Scrub sinks which meet the requirements of Section 1224.15.3.5.
6. Service areas which meet the requirements of Section 1224.15.3.
7. A housekeeping room shall be provided for the exclusive use of outpatient surgery. It shall be directly accessible from the service area.

**1224.39.3 Gastrointestinal endoscopy.** If gastrointestinal endoscopy is performed in the outpatient service area, the endoscopy suite shall be divided into a minimum of three major functional areas: the procedure room(s), instrument processing room(s), and patient holding/preparation and recovery room or area and the following shall be provided:

**1224.39.3.1 Procedure room(s).**

**1224.39.3.1.1 Space requirements.** Procedure room shall have a minimum clear floor area of 200 square feet ( $18.6 \text{ m}^2$ ). Room arrangement shall permit a minimum clearance of 3 feet, 6 inches (1067 mm) at each side, head, and foot of the gurney/table.

**1224.39.3.1.2 Handwashing fixture.** A separate dedicated handwashing station with hands-free controls shall be available in the procedure room.

**1224.39.3.2 Processing room.**

**1224.39.3.2.1 Dedicated processing room(s).** Dedicated processing room(s) for cleaning and decontaminating instruments shall be provided. The cleaning area shall allow for flow of instruments from the contaminated area to the clean assembly area and then to storage.

**1224.39.3.2.2 The decontamination area shall be equipped with the following:**

1. Utility sink(s) shall be provided as appropriate to the method of decontamination used.
2. One freestanding handwashing station.
3. Work counter space(s).

**1224.39.3.3 Pre-operative patient holding.** A pre-operative patient holding area shall be provided in accordance with Section 1224.15.2.

**1224.39.3.4 Post-anesthesia recovery area.** A post-anesthesia recovery area shall meet the requirements of Section 1224.16.

**1224.39.3.5 Communication system.** A system for emergency communication shall be provided.

**1224.39.4 CANCER TREATMENT/INFUSION THERAPY SERVICE SPACE.**

**1224.39.4.1 General.** If provided, cancer treatment/infusion therapy service shall comply with the following:

**1224.39.4.2 Treatment area.**

**1224.39.4.2.1 Location.** The treatment area may be an open area and shall be separated from administrative and waiting areas.

**1224.39.4.2.2 Nurses' station(s).** Shall be located within the cancer treatment/infusion therapy area and designed to provide visual observation of all patient stations.

**1224.39.4.2.3 Individual patient treatment areas.** Shall contain at least 80 square feet ( $7.4 \text{ m}^2$ ).

There shall be at least a 4-foot (1219 mm) space around and between beds and/or lounge chairs used for chemotherapy treatment/infusion.

**1224.39.4.2.4 Handwashing fixtures.** Shall be located convenient to the nurses' station and patient treatment areas. There shall be at least one handwashing fixture serving no more than four patient stations. These shall be uniformly distributed to provide equal access from each patient station.

**1224.39.4.2.5 Privacy.** The open unit shall be designed to provide privacy for each patient.

**1224.39.4.2.6 Medication dispensing.** If provided, there shall be a medication dispensing station for the cancer treatment/infusion therapy area. A work counter and handwashing fixture(s) shall be included in the area. Provisions shall be made for the controlled storage, preparation, distribution and refrigeration of medications.

**1224.39.4.2.7 Examination room.** An examination room with a handwashing fixture shall be provided with at least 100 square feet ( $9.29 \text{ m}^2$ ).

**1224.39.4.2.8 Clean utility room.** A clean utility room shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility rooms or holding rooms shall be separated and have no direct connection.

**1224.39.4.2.9 Soiled utility room.** A soiled workroom shall be provided and contain a sink, handwashing fixture, work counter, storage cabinets, waste receptacles and a soiled linen receptacle.

**1224.39.4.2.10 Nourishment station.** If nourishment station for the cancer treatment/infusion therapy service is provided, the nourishment station shall contain a sink, a work counter, a refrigerator, storage cabinets and equipment for serving nourishment as required.

**1224.39.4.2.11 Housekeeping room.** Adjacent to and for the exclusive use of the unit.

**1224.39.4.2.12 Supplies.** Supply areas or supply carts shall be provided.

**1224.39.4.2.13 Storage.** Storage space shall be available for wheelchairs and gurneys. If gurneys are provided, they shall be out of the direct line of traffic.

**1224.39.4.2.14 Clean linen storage.** A clean linen storage area shall be provided. This may be within the clean utility room, a separate closet, or an approved distribution system. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

**1224.39.4.2.15 Patient toilet.** A patient toilet room with a lavatory shall be provided.

#### 1224.39.4.3 Ancillary facilities.

**1224.39.4.3.1 Staff lounge, lockers and toilet(s).** Space shall be available for male and female personnel for staff clothing change area and lounge. The areas shall contain lockers, toilet(s), and hand-washing fixtures.

**1224.39.4.3.2 Patient storage.** Storage for patients' belongings shall be provided.

**1224.39.4.3.3 Administrative services.** Office and clinical work space shall be provided.

**1224.39.4.3.4 Special design elements.** Decorative water features and fish tanks shall not be located inside cancer treatment/infusion therapy unit.

**1224.40 SKILLED NURSING SERVICE SPACE.** If provided a skilled nursing service unit shall be housed in a separate and distinct nursing unit and shall comply with the applicable requirements of Section 1225.

**1224.41 SOCIAL SERVICE SPACE.** If provided, the social service space shall include office or other space for privacy in interviewing, telephoning and conducting conferences.

### SECTION 1225 [OSHPD 2] SKILLED NURSING AND INTERMEDIATE-CARE FACILITIES

**1225.1 Scope.** The provisions of this section shall apply to skilled nursing and intermediate-care facilities, including distinct part skilled nursing and intermediate-care services on a general acute-care or acute psychiatric hospital license, provided either is in a separate unit or a freestanding building. Skilled nursing facilities and intermediate-care facilities shall provide all common elements and support services. The required services for skilled nursing and intermediate-care facility licensure: dietary, pharmacy services, and activity program shall be provided. At the option of the provider, the medical model or the household model may be used.

**1225.1.1 Small house skilled nursing facilities.** Skilled nursing facilities participating in the Small House Nursing Facilities Pilot Program established by and in conformance with Section 1323.5 of the California Health and Safety Code, shall meet all the provisions of Section 1225.4 Common Elements and Section 1225.5.2 Household Model applicable to small house skilled nursing facilities.

**1225.2 Application.** New buildings and additions, alterations or repairs to existing buildings subject to licensure shall comply with applicable provisions of the California Electrical Code, California Mechanical Code, California Plumbing

Code, California Fire Code (Parts 3, 4, 5 and 9 of Title 24), and this section.

**Exception:** See Section 1224.2.

**1225.3 Definitions.** Refer to Section 1224.3.

#### 1225.4 COMMON ELEMENTS.

##### 1225.4.1 NURSING SERVICE SPACE.

**1225.4.1.1 Nurses' station.** A nurses' station in free-standing skilled nursing and intermediate-care facilities shall be provided within each nursing unit. Nurses' stations shall be designed to serve no more than 60 beds.

**1225.4.1.1.1 Components.** Nurses' stations shall be provided with a cabinet, a desk, space for records, a bulletin board, a telephone, a specifically designated, lockable and illuminated medicine storage compartment, and a handwashing fixture. If a separate medicine room is provided, it shall have a lockable door and a sink. This sink cannot replace the required nurses' station hand-washing fixture.

**1225.4.1.1.2 Size.** Nurses' stations serving 25 or less beds shall have a minimum floor area of 100 square feet ( $9.29\text{ m}^2$ ). Nurses' stations servicing more than 25 beds shall have a minimum floor area of 125 square feet ( $11.6\text{ m}^2$ ). The minimum dimension of any nurses' station shall not be less than 8 feet (2438 mm).

**1225.4.1.1.3 Distance.** In free-standing skilled nursing and intermediate-care facilities, the distance between the nurses station entrance and the center of the doorway of the most remote patient bedroom shall not exceed 150 linear feet (45,720 mm).

**Exception:** The 150-foot (45,720 mm) limit does not apply to distinct part skilled nursing and intermediate-care services provided as a separate unit in a general acute-care hospital or acute psychiatric hospital.

**1225.4.1.2 Room identification.** Each patient room shall be labeled with an identification number, letter, or combination of the two.

**Exception:** Small house skilled nursing facilities.

**1225.4.1.3 Utility rooms.** Utility rooms shall be provided in each nursing unit. Soiled and clean utility or holding rooms shall be separated and have no direct connection.

**1225.4.1.3.1 Clean utility room.** If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing fixture may be omitted.

**1225.4.1.3.2 Soiled workroom or soiled holding room.** This room shall be separate from the clean utility room. The soiled workroom/utility room shall contain a clinical sink (or equivalent flushing-rim fixture). The room shall contain a handwashing fixture. The above fixtures shall both have a hot and

*cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.*

**1225.4.1.4 Visual privacy.** A method of assuring visual privacy for each patient shall be provided in patient rooms and in tub, shower and toilet rooms.

**1225.4.1.5 Treatment or exam room.** If provided, the treatment or exam room shall comply with all of the requirements of Section 1224.4.4.

**1225.4.1.6 Toilet room and bath facilities.** Separate toilet room facilities shall be provided for the use of patients and personnel.

**1225.4.1.6.1 Grab bars.** Each toilet, bathtub and shower serving patients shall be provided with conveniently located grab bars.

**1225.4.1.6.2 Bathroom facilities.** Bathroom facilities shall be provided for patients in convenient locations in at least the following ratios:

Bathtubs or showers	1:20 patients or major fraction thereof.
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(Minimum one bathtub on each floor)

Lavatories	1:8 patients
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(Fixtures shall be equipped with gooseneck spouts without aerators and may have conventional controls.)

Toilets	1:6 patients
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Fixtures serving individual patient rooms shall not be considered as meeting the required ratios for bedrooms not served by individual adjoining toilet room or bathrooms. Changes in these ratios for wards or units in which bed patients only are to be cared for, may be permitted by the enforcing agency.

**1225.4.1.7 Patient/nurse call system.** A patient/nurse call system complying with Section 517.123, California Electrical Code, shall be provided.

**1225.4.1.7.1** In small house skilled nursing facilities, visitor toilet room(s) shall be equipped with a nurse call station.

**1225.4.1.8 Special-purpose rooms.** Special-purpose rooms for the purpose of single-patient occupancy shall be provided at a ratio of one room for every 35 patients or fraction thereof. Airborne infection isolation rooms may be included in determining the number of special-purpose rooms required for the facilities.

**Exception:** The special-purpose room may be omitted if all patient rooms are single-resident rooms.

**1225.4.1.9 Airborne infection isolation rooms.** If provided, the airborne infection isolation room shall comply with all of the requirements of Section 1224.14.3.

**1225.4.1.10 Protective environment room(s).** If provided, the protective environment room shall comply with all of the requirements of Section 1224.14.4.

#### **1225.4.2 DIETETIC SERVICE SPACE.**

**1225.4.2.1 General.** Food service facilities and equipment shall conform with these standards, the standards of the National Sanitation Foundation, and the requirements of the local public health agency.

**1225.4.2.1.1 Distribution.** Provision(s) shall be made for transport of hot and cold foods as required, appropriate for the type of food service selected.

**1225.4.2.1.2 Dining space.** Separate dining spaces shall be provided for patients and staff. These spaces shall be separate from the food preparation and distribution areas.

**Exception:** Shared dining shall be provided for patients and staff in small house skilled nursing facilities.

**1225.4.2.1.3 Location.** The design and location of dining facilities shall encourage patient use.

**1225.4.2.1.4 Food service.** Facilities shall be furnished to provide nourishment and snacks between scheduled meal service.

**1225.4.2.2 Functional elements.** The following facilities, in the size and number appropriate for the type of food service selected, shall be provided:

**1225.4.2.2.1 Location.** Food-service areas shall be directly accessible to the entry for food supply deliveries and for the removal of kitchen wastes.

**1225.4.2.2.2 Receiving/control stations.** A control station shall be provided for the receiving and control of incoming dietary supplies.

**1225.4.2.2.3 Food, preparation facilities.** Food preparation facilities shall be provided to accommodate the method of food preparation required.

1. Conventional food preparation systems require space and equipment for preparing, cooking, and baking.

2. Convenience food service systems using frozen prepared meals, bulk packaged entrees, individual packaged portions, or those using contractual commissary services require space and equipment for thawing, portioning, cooking, and baking.

**1225.4.2.2.4 Handwashing station(s).** Handwashing station(s) shall be located in the food preparation area.

**1225.4.2.2.5 Ice-making facilities.** Ice-making facilities may be located in the food preparation area or in a separate room. They shall be easily cleanable and convenient to the dietary function.

**1225.4.2.2.6 Assembly and distribution.** A patient tray assembly area shall be provided and shall be located within close proximity to the food preparation and distribution areas.

1. If food service carts are utilized, a cart distribution system shall accommodate spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. Cart circulation shall not be through food preparation areas.

**1225.4.2.2.7 Ware-washing facilities.** Ware-washing space shall be provided in a room separate from the food preparation and serving area. It shall be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares shall be transferred for storage or use in the dining area without having to pass through food preparation areas.

1. Commercial-type ware-washing equipment shall be provided.
2. Space shall be provided for receiving, scraping, sorting, and stacking soiled tableware, and for transferring clean tableware to the using areas.
3. Convenient handwashing stations shall be provided in the ware-washing space.

**1225.4.2.2.8 Pot-washing facilities.** Pot-washing facilities shall include multi-compartmented sinks.

**1225.4.2.2.9 Office space.** Office or other space shall be provided for the dietician or dietetic service supervisor.

#### **1225.4.2.2.10 Storage.**

1. Food storage space, including cold storage, shall be provided for a supply of food of at least a 7 day staple, 2 day frozen, 2 day perishable, and an emergency food and water supply. All food shall be stored clear of the floor. The lowest shelf shall be not less than 12 inches (305 mm) above the floor or shall be closed in and sealed tight, for ease of cleaning.

As a minimum, dietary storage space shall be provided in accordance with the following schedule:

Licensed Bed Capacity	Storage Space
1 to 99 beds	2 square feet (0.19 m <sup>2</sup> ) per bed
100 to 199 beds	200 square feet (18.58 m <sup>2</sup> ) plus 1 square foot 0.0929 m <sup>2</sup> ) per bed in excess of 100 beds
200 beds and over	300 square feet (27.99 m <sup>2</sup> ), plus 1/2 square foot (0.0465 m <sup>2</sup> ) per bed in excess of 200 beds

Space to allow refrigeration for the storage of frozen and chilled foods shall be provided at a minimum of 2 cubic feet (0.057 m<sup>3</sup>) of usable space per bed.

2. Additional storage space for dietetic service supplies, such as paper products, equipment, tray delivery carts, etc. shall be provided.
3. Storage areas and sanitizing facilities for cans, carts, and mobile-tray conveyors shall be provided.
4. Waste, storage, and recycling facilities (per local requirements) shall be located in a sepa-

rate room easily accessible to the outside for direct pickup or disposal.

**1225.4.2.2.11 Toilet rooms.** Toilet rooms shall be provided for the exclusive use of the dietary staff. They shall not open directly into the food preparation areas, but shall be in close proximity.

**Exception:** Small house skilled nursing facilities utilizing staff trained for dietary and care-giving responsibilities may provide toilet room(s) serving both the dietary and nursing service areas.

**1225.4.2.2.12 Lockers.** An enclosed, separate area shall be provided for dietetic service employees' clothing and personal belongings.

**Exception:** Small house skilled nursing facilities utilizing staff trained for dietary and care-giving responsibilities may provide common locker room(s) serving both the dietary and nursing service areas.

**1225.4.2.2.13 Housekeeping room.** A housekeeping room meeting the requirements of Section 1224.4.15 shall be located within the dietary department for the exclusive use of the dietary department.

**1225.4.2.3 Outside service.** On approval of the Licensing Agency, when food is provided by an outside food service, the facility shall maintain adequate space, equipment, and food supplies to accommodate required functional elements listed in Section 1225.4.2.2, as required to provide patient food service in the event that the outside food service is interrupted.

### SUPPORT SERVICES

#### **1225.4.3 ADMINISTRATION SPACE.**

**1225.4.3.1 Administration and public spaces.** An administration area shall be provided which shall include space for business, administration, admitting, public toilet room(s), lobby, and public telephone.

**1225.4.3.2 Medical record storage.** Space shall be provided for the storage of medical records.

**1225.4.3.3 Office.** An office for the director of nurses shall be provided.

**1225.4.3.4 Small house skilled nursing facilities.** Small house skilled nursing facility units may provide the administration and public spaces, medical record storage and the nursing director's office in a separate centralized support area attached to the unit(s) or detached in a separate building in close proximity to the unit(s), as a part of the small house skilled nursing facility. This building shall be under OSHPD jurisdiction.

#### **1225.4.4 STERILE SUPPLIES.**

**1225.4.4.1 Storage.** Each facility shall provide space for the storage of disposable sterile supplies or provide space for sterilization and disinfection equipment.

**Exception:** Facilities with contractual arrangements for outside autoclaving and sterilizing services.

**1225.4.4.2 Central sterile supply.** If provided, shall accommodate the following:

**1225.4.4.2.1 Minimum requirements.** A central supply and sterilizing area shall be provided. Rooms

and spaces shall accommodate the following services and equipment:

1. Soiled work area. A receiving and gross cleaning area which shall contain work space and equipment for cleaning medical and surgical equipment and for disposal of or processing of soiled material.
2. Clean work area. A clean work area which shall contain work space and equipment for sterilizing medical and surgical equipment and supplies.
3. Sterilizing space.
4. Storage. Space for sterile supplies and unsterile supplies.

**1225.4.4.2.2 Sterilizers.** All sterilizers and autoclaves which emit steam exhaust shall be vented to the outside of the building. Such vents shall be independent from the plumbing vent system.

**Exception:** Small instrument sterilizers.

#### 1225.4.5 STORAGE.

**1225.4.5.1 Required areas.** Facilities shall provide combined general and specialized storage in accordance with the following schedule:

Licensed Bed Capacity	Storage Area
1 to 10 beds	120 square feet (11.15 m <sup>2</sup> ) minimum
11 to 100 beds	12 square feet (1.11 m <sup>2</sup> ) per bed
Over 100 beds	1,200 square feet (111.48 m <sup>2</sup> ) plus 5 square feet (0.46 m <sup>2</sup> ) per bed for each bed over 100

**1225.4.5.2 Specialized storage.** Shall include those spaces identified in the dietetic food storage of Section 1225.4.2.2.10 and as follows:

**1225.4.5.2.1 Linen.** Separate and enclosed facilities for clean and soiled linen in each nursing unit. The clean linen storage space shall have a minimum area of 10 square feet (0.93 m<sup>2</sup>) and may be within the clean utility room. The soiled linen collection space shall have an area of no less than 10 square feet (0.93 m<sup>2</sup>), except where linen chutes are provided, and may be within the soiled utility room.

**1225.4.5.2.2 Supply.** One supply storage space having a minimum area of 15 square feet (1.39 m<sup>2</sup>) shall be provided in each nursing unit. Supply storage may be within the clean utility room used only as part of a system for distributing clean and sterile supplies.

**1225.4.5.2.3 Wheelchairs.** A room or space shall be provided in each nursing unit for wheelchairs and stretchers. The wheelchair and stretcher space shall have a minimum area of 15 square feet (1.39 m<sup>2</sup>).

**1225.4.5.2.4 Separate supplies.** Sterile and unsterile supplies shall be stored separately.

**1225.4.5.2.5 Location.** All storage spaces shall be directly accessible on the site of the licensed facility.

**1225.4.6 HOUSEKEEPING ROOMS.** Housekeeping rooms shall be provided to serve each department and nursing unit, and may be shared by compatible departments, except when specifically required by other sections.

**1225.4.7 LAUNDRY.** If a laundry is to be provided, the following is required in addition to the laundry room:

1. A separate soiled linen receiving, holding and sorting room with handwashing fixture.
2. A separate clean linen storage, issuing and holding room.
3. Storage for laundry supplies.

**1225.4.7.1 Outside service.** If linen is processed off site, the following shall be provided within the facility:

1. A soiled linen holding room.
2. A separate clean linen receiving and storage room.

**1225.4.8 EMPLOYEE DRESSING ROOMS AND LOCKERS.** Separate dressing rooms with toilet(s), lavatories, and lockers for male and female personnel shall be provided.

**Exception:** Small house skilled nursing facilities, with a peak shift of less than five staff, may provide a single toilet room serving both male and female personnel in compliance with the California Plumbing Code Table 4-3, footnote 7.

**1225.5 SKILLED NURSING UNIT MODELS.** The requirements of the Medical Model or the Household Model shall apply to the Nursing Unit(s) in its entirety.

#### 1225.5.1 MEDICAL MODEL.

**1225.5.1.1 General construction.** Skilled nursing and intermediate-care facilities shall comply with Sections 1224.4 through 1224.13 whenever applicable.

#### 1225.5.1.2 NURSING SERVICE SPACE.

**1225.5.1.2.1 Patient bedrooms.** Patients shall be accommodated only in rooms with the following minimum floor area, exclusive of toilet rooms, wardrobes, entrance vestibules, and fixed furnishings or equipment.

1. Single-patient rooms: 110 square feet (10.21 m<sup>2</sup>).
2. Multi-patient rooms: 80 square feet (7.43 m<sup>2</sup>) per bed.

**1225.5.1.2.2 Bed clearance.** A minimum distance of 3 feet (914 mm) shall be provided between beds and 4 feet (1219 mm) between the foot of beds and walls or fixed objects in multi-patient rooms, and 3 feet (914 mm) in single-patient rooms.

**1225.5.1.2.3 Patient room beds.** Patient rooms shall not be designed to permit the placement of beds more than three deep from the exterior window, but shall be of such shape and dimensions to allow for the performance of routine functions, including the easy transfer of patients to and from bed to wheelchair or wheeled stretcher. No patient room shall be designed to accommodate more than four beds.

**1225.5.1.2.4 Outside exposure.** All patient bedrooms shall have an outside exposure and shall not be below ground level.

**1225.5.1.2.5 Patient storage.** Each patient room shall be provided with wardrobe or locker spaces for clothing, toilet articles, or other personal belongings for each patient.

**Exception:** Pediatric and psychiatric patient rooms.

#### 1225.5.1.3 PHARMACEUTICAL SERVICE SPACE.

**1225.5.1.3.1 Drug space and storage.** Adequate space shall be provided at each nursing station for the storage of drugs and preparation of medication doses.

**1225.5.1.3.2 Drug access.** All spaces and areas used for the storage of drugs shall be lockable and accessible to authorized personnel only.

**1225.5.1.3.3 Narcotics.** Specific space shall be designed for safe storage of narcotics and other dangerous drugs.

**1225.5.1.3.4 Drug refrigeration.** Facilities shall provide for storage of drugs requiring refrigeration.

**1225.5.1.3.5 Pharmacy.** The pharmacy shall not serve the general public unless a separate public entrance or a separate public serving window is utilized.

#### 1225.5.1.4 ACTIVITY PROGRAMMING SPACE.

Designated activity areas appropriate to independent and group needs of patients shall be provided as follows:

##### 1225.5.1.4.1 Skilled nursing facilities.

1. **Recreation room.** Each floor of each building accommodating six or more patients shall be provided with a recreation room with a minimum of 100 square feet ( $9.29 m^2$ ).
2. **Recreation and dining.** A minimum of 100 square feet ( $9.29 m^2$ ) plus 12 square feet (1.11  $m^2$ ) per bed shall be provided for recreation and dining activities.

##### 1225.5.1.4.2 Intermediate-care facilities.

1. **Recreation room.** Each floor of each building accommodating five or more patients shall be provided with a recreation room with a minimum of 150 square feet ( $13.94 m^2$ ).
2. **Recreation and dining.** A minimum of 30 square feet ( $2.79 m^2$ ) per bed for recreation and dining activities.
3. **Outdoor space for activities and recreation.**

**1225.5.1.4.3 Equipment and supplies.** Recreation and dining spaces shall be provided with space to store equipment and supplies.

#### 1225.5.2 HOUSEHOLD MODEL.

**1225.5.2.1 General construction.** Skilled nursing and intermediate-care facilities and small house skilled nursing facilities shall comply with Sections 1224.4 through 1224.13 whenever applicable, and the following sections:

**1225.5.2.1.1 Door thresholds.** Door thresholds, except where required at exterior doors and expansion joint covers, shall be designed to facil-

itate use of wheelchairs and carts and to prevent tripping, and shall provide a smooth and level transition from surface-to-surface.

**1225.5.2.1.2 Seating area.** A seating area(s) located out of the required egress width shall be provided along the access corridor that is used by patients.

**1225.5.2.1.3 Towel bars.** Towel bars shall be provided at each bathing facility.

**1225.5.2.1.4 Hardware.** All patient use plumbing fixtures and door operating hardware shall be equipped with lever type hardware for easy gripping and turning.

**1225.5.2.1.5 Drinking fountain.** A minimum of one drinking fountain shall be provided per resident floor, unless drinking water is available from the resident dietary area.

##### 1225.5.2.2 Cluster/household unit and resident unit.

**1225.5.2.2.1 Design.** Each resident unit shall consist of the resident rooms, resident support areas, and resident living areas. The unit shall be designed as a cluster/household resident unit or as a resident unit with double or single loaded access corridors. If the cluster/household unit design is utilized, it shall be designed around resident support and living areas with a maximum of 20 patients per cluster/household unit. If the double or single loaded corridor resident unit design is utilized, the access corridor shall be designed so that travel distance from the entrance of the resident unit to the furthest resident room door is no more than 60 feet (18.29 m) without a change of corridor direction or a node for a resident sitting area.

**Exception:** Small house skilled nursing facilities are limited to household units with a maximum of 12 patients per unit. Small house household units may also be developed as individual, free-standing facilities.

**1225.5.2.2.2 Arrangement.** Each resident unit shall be arranged to avoid unnecessary and unrelated travel through the unit.

**1225.5.2.2.3 Distinct parts or neighborhoods.** Both the cluster/household unit and resident unit designs may be grouped into distinct parts or neighborhoods to a maximum of 60 patients. These distinct parts or neighborhoods composed of the resident unit(s) as described in Section 1225.5.2.2.1 may share the functional requirements of the resident support areas as described in Sections 1225.5.2.4 and 1225.5.2.5 of this code.

##### 1225.5.2.3 Resident room.

**1225.5.2.3.1 Capacity.** In new construction and additions, the maximum room capacity shall be two patients. Resident sleeping areas in all double resident room designs shall be visually separated from each other by a full height wall or a permanently installed sliding or folding door or partition, and shall provide each patient direct use of and direct

access to an exterior window at all times. Walls, doors, or partitions used to separate resident beds shall provide visual and acoustical separation. A door leading to each resident bed area in addition to the corridor door is not required. Other resident room arrangements where a permanent partition or door is not used to separate the resident sleeping areas may be utilized if adequate visual separation such as a cubicle curtain(s) and an exterior window for each individual resident sleeping area is provided. In this case individual thermostats for the resident bed areas shall not be required.

**Exception:** In small house skilled nursing facilities, resident sleeping areas in all double-resident room designs shall be visually separated from each other by a full-height wall or a permanently installed sliding or folding door or partition, and shall provide each patient direct use of and direct access to an exterior window at all times. Walls, doors, or partitions used to separate resident beds shall provide visual and acoustical separation.

**1225.5.2.3.2 Renovation.** Where renovation work is undertaken of the resident room that alters the physical configuration of the resident room and the present capacity is more than two patients, the maximum room capacity shall be no more than two patients at the conclusion of the renovation.

**1225.5.2.3.3 Space requirements.** Rooms shall have a minimum of 100 square feet ( $9.29 \text{ m}^2$ ) of clear floor area per bed in double resident rooms and 120 square feet ( $11.15 \text{ m}^2$ ) of clear floor area in single resident rooms, exclusive of the space consumed by toilet rooms, closets, lockers, wardrobes, lavatories, alcoves, and door swings into the room or entrance vestibules, whichever is greater. For the purpose of minimum clear floor area, the entrance vestibule is defined as that floor area located between the room entrance door and the room floor area containing the resident bed(s).

**1225.5.2.3.4 Arrangement.** Dimensions and arrangement of resident rooms shall be designed to accommodate at least two bed positions to provide patient choice of bed placement. All such bed positions shall be designed so that the bed will not obstruct access to the supporting utilities serving the bed, such as the nurse call station, and the required electrical outlets that provide service for that bed. Only one bed position design shall be required for a bed that is equipped with a piped medical gas headwall unit, unless special requirements such as providing care for bariatric patients does permit the design of two bed positions in the room.

**1225.5.2.3.5 Clearance.** A 3 feet (0.91 m) wide clear access to each bed shall be provided along at least 75 percent of the length of one side of the bed and shall be designed to allow access for the use of a wheelchair and other portable equipment. For beds equipped with a piped-in medical gas headwall unit, there shall be a minimum of 3 feet (0.91 m) between the sides and foot of the bed and any wall or any

other fixed obstruction. For planning purposes, a full-size bed is assumed to be 3 feet 6 inches (1.07 m) wide by 8 feet (2.43 m) long.

**1225.5.2.3.6 Renovations.** For renovations that alter the physical configuration of the resident room but have existing structural limitations that require two resident beds to be located in a shared resident sleeping area, there shall be a minimum of 3 feet (0.91 m) between the sides and foot of the bed and the adjacent bed. If one bed must be located to the side of the other bed, there shall be a clearance of 4 feet (1.22 m) to any fixed obstruction available at the foot of this bed to permit the passage of equipment and bed without moving the resident's bed located nearest to the room door.

**Exception:** In small house skilled nursing facilities, two beds shall not be permitted in a shared resident sleeping area.

**1225.5.2.3.7 Resident toilet or bath room.** Each patient shall have access to a toilet room without having to enter the general corridor area or the resident bed area in a shared resident room. One toilet room shall serve no more than two patients and no more than two resident rooms. The door to the toilet room shall be side hinged and either swing out from the toilet room, or be equipped with emergency release hardware. Sliding doors equipped with sliding door hardware located on the resident room side of the wall and not equipped with a bottom door track shall be permitted. If a sliding door is used in a resident toilet or bath room, a D-shaped handle at least 4 inches (10.16 cm) long shall be provided to open the door. The sliding door shall permit access, and negate the need to push against a patient who may have collapsed within the toilet room. Unless otherwise required by this code, this door shall be at least 36 inches (914.4 mm) wide. A lavatory shall be provided in each resident toilet room.

**1225.5.2.3.8 Wardrobe closet.** Each resident room shall be provided with a wardrobe or closet for each patient. Each wardrobe or closet shall have minimum inside dimensions of 2 feet (0.61 m) in depth by 1 foot 8 inches (0.51 m) in width. Each shall be accessible to the patient at all times and shall have adjustable shelf(s) and an adjustable clothes rod that is adjustable in at most 4 inches (10.16 cm) increments from 4 feet (1.22 m) to 5 feet 8 inches (1.73 m) above finished floor or higher as closet size permits. When the wardrobe or closet is designed to meet the requirements for accessibility per Chapter 11B of this code, it shall include additional accessible storage area(s) for full-length garments. The shelf may be omitted if the clothing unit provides at least two drawers. Locked storage for personal items shall be provided within the resident sleeping room or area.

**1225.5.2.4 Resident support area.**

**1225.5.2.4.1 Features and arrangement.** Size and features of each resident support area will depend upon the number and type of patients served. The resident support area may be arranged and located to

serve more than one resident unit, but at least one such support area shall be provided on each resident floor. The following resident support areas shall be located in or be readily accessible to each resident unit.

**1225.5.2.4.2 Staff work area.** A centralized staff work area shall be provided. It shall have space for supervisory administrative work activities, charting, and storage. In each resident unit, the functions of administrative work, charting and storage may be located among several separate direct care staff work areas. In this case, a centralized staff work area is not required.

**1225.5.2.4.3 Clean utility.** A clean utility or clean holding room for storage and distribution of clean supply materials shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing fixture, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as a part of a system for distribution of clean and sterile supply materials, the work counter and handwashing fixture requirements may be omitted. The minimum size of the room shall be 15 square feet ( $1.39 \text{ m}^2$ ) with 1 square foot ( $0.092 \text{ m}^2$ ) of additional space provided per patient for over 15 patients and may be allocated among several clean utility or clean holding rooms or closets.

**1225.5.2.4.4 Soiled utility.** A soiled utility or soiled holding room(s) shall be provided. The soiled utility function shall be comprised of a flushing rim clinical service sink or other appropriate flushing fixture, with bedpan rinsing device, soiled linen receptacles, waste receptacles and a work counter with a usable minimum work surface area of 6 square feet ( $0.56 \text{ m}^2$ ). The total minimum size of the room shall be 20 square feet ( $1.86 \text{ m}^2$ ) with 1.5 square feet ( $0.140 \text{ m}^2$ ) of additional space provided per patient for over 15 patients and may be allocated among several soiled utility or soiled holding rooms. Rooms used only for the holding of soiled materials need contain only a handwashing fixture.

**1225.5.2.4.5 Medicine preparation.** A medicine preparation room or a self contained medicine dispensing unit shall be provided for the provision of medication distribution. The self-contained medicine dispensing unit shall be under the visual control of the staff. If a medicine preparation room is utilized, it shall be equipped with a lockable door, have a minimum area of 50 square feet ( $4.65 \text{ m}^2$ ) and shall contain a refrigerator, locked storage for controlled drugs, a handwashing fixture, and a work counter with a minimum of 6 square feet ( $0.56 \text{ m}^2$ ) of work surface. If a self-contained medicine dispensing unit is utilized, it may be located at the nurses' station, in the clean utility room, in an alcove, or in other spaces convenient for staff control provided the area occupied by the unit does not encroach upon required minimum areas. The dispensing unit may be used in a medicine preparation

room as locked storage for controlled drugs within the minimum area of 50 square feet ( $4.65 \text{ m}^2$ ), however, the standard "cup sinks" provided in many self-contained units shall not be a substitute for the required handwashing fixture. If there is no linen storage in the clean utility room, medicine preparation may be part of the clean utility room in which case an additional 20 square feet ( $1.8 \text{ m}^2$ ) dedicated for this purpose shall be required. A refrigerator shall also be required if medicine preparation is included in this room. Non-controlled prescription drugs may be stored inside the resident's sleeping room or toilet room if they are secured inside of an automatic closing and automatic locking dispensing unit that is secured in place.

**1225.5.2.4.5.1** In small house skilled nursing facilities, if self-contained medicine dispensing units are provided, they shall be located in either a medication preparation room or a clean utility room.

**1225.5.2.4.6 Equipment storage.** An equipment storage room(s) shall be provided for storage of resident unit equipment. The minimum area required shall be equal to 2 square feet ( $0.19 \text{ m}^2$ ) for each patient with no room being less than 20 square feet ( $1.86 \text{ m}^2$ ) in area.

**1225.5.2.4.7 Housekeeping room.** A housekeeping room(s) shall be provided for storage and use of housekeeping supplies and equipment.

**1225.5.2.4.8 Clean linen room.** A clean linen storage room, closet, or area shall be provided. This area may be located within the clean utility or clean holding room and shall be large enough to accommodate the storage of linen carts.

**1225.5.2.4.9 Nourishment room.** A nourishment room or area for serving nourishments between meals shall be provided and shall contain a work counter, refrigerator, storage cabinets, and sink. Ice for patients' consumption shall be provided by an icemaker unit that may serve more than one nourishment station if the nourishment stations are in close proximity to each other. Where the icemaker unit is accessible to patients or the public, it shall be a self-dispensing type. The nourishment room shall include space for trays and dishes used for nonscheduled meal service. A handwashing fixture shall be in or immediately accessible from the nourishment room.

**1225.5.2.4.9.1** In small house skilled nursing facilities, the nourishment area may be provided as part of the resident dietary area required under Section 1225.5.2.5.4.

**1225.5.2.4.10 Storage alcove.** A storage alcove space for a wheelchair(s) shall be provided in an area located out of the required means of exit access.

**1225.5.2.4.11 Resident bathing facilities.** Resident bathing facilities shall be provided with a minimum of one bathtub or one hydro tub per resident unit, or one shower for every 20 patients or fraction thereof not otherwise served by bathing facilities in resident rooms. When centralized bathing is provided,

patients shall have access to at least one bathing room per floor or unit sized to permit assisted bathing in a tub or shower in that resident unit. The bathtub in this room shall be accessible to patients in wheelchairs and the shower shall accommodate a shower chair. Other tubs or showers shall be in individual rooms or curtained enclosures with space for private use of the bathing fixture, for drying and dressing, and access to a grooming location containing a sink, mirror, and counter or shelf. A separate private toilet shall be provided that is directly accessible to each multi-bathing fixture central bathing area without requiring entry into the general corridor. This toilet may also serve as a toilet training facility. This centralized bathing area shall comply with Chapter 11B of this code.

**1225.5.2.4.12 Private bathing.** All showers located in bathrooms connected directly to the resident room shall be designed so that a shower chair can be easily rolled over the threshold. Resident rooms and associated toilet rooms, required to be accessible, shall comply with Chapter 11B of this code.

#### 1225.5.2.5 Resident living area.

**1225.5.2.5.1 Dining.** Dining, lounges, and recreation and social areas for patients shall be provided in each resident unit. The total area of these spaces shall be a minimum of 35 square feet ( $3.25 \text{ m}^2$ ) per patient with a minimum total area of 225 square feet ( $20.90 \text{ m}^2$ ). At least 20 square feet ( $1.86 \text{ m}^2$ ) per patient shall be available for dining. Storage for supplies and equipment shall be provided in the recreation area.

**1225.5.2.5.2 Outdoor area.** Outdoor area(s) shall be provided for the use of all patients and shall include walking paths of durable materials, benches, shaded areas, and visual focusing element(s) such as landscaping, sculpture(s), or fountain(s). Security fencing if used shall be of a residential design and provide some visual connection to the exterior of the secured area. If an exterior visual connection is not possible or desirable, then the interior of the outside area shall be landscaped to be visually interesting.

**1225.5.2.5.3 Storage.** Storage for supplies, patient needs, and recreation shall be provided. The minimum required area shall be 5 square feet ( $0.46 \text{ m}^2$ ) per bed up to 600 square feet ( $55.74 \text{ m}^2$ ).

**1225.5.2.5.4 Dietary area.** A resident dietary area shall be provided in the resident unit for the use of staff, patients, and family. The resident dietary area may include cooking equipment, counter tops, kitchen sink, and storage areas. This dietary area is in addition to the dietetic service space requirements in Section 1225.4.2.

**1225.5.2.5.4.1 Food preparation spaces in the resident dietary area in a small house skilled nursing facility shall be designed to accommodate the method of food preparation required.** The California Department of Public Health, Licensing and Certification shall review proposed food services spaces at a preliminary stage of plan review.

**1225.5.2.5.4.2.** The resident dietary area in a small house skilled nursing facility shall provide a handwashing fixture. This handwashing fixture shall be in addition to the kitchen sink and shall be located in or immediately accessible to the resident kitchen facilities.

**1225.5.2.5.4.3** When provided, the resident dietary area in a small house skilled nursing facility shall have a commercial ware-washing space meeting the requirements for the care model used. This space shall be designed to prevent cross contamination by providing area for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to point-of-use areas.

**1225.5.2.5.4.4** The resident dietary area in a small house skilled nursing facility shall provide access to self-dispensing drinking water and self-dispensing ice.

- (a) Ice-making equipment shall be accessible to residents and visitors
- (b) Ice-making equipment shall be located, designed, and installed to minimize noise.
- (c) Ice-making equipment shall be permitted to serve more than one food area within resident kitchen facilities.

**1225.5.2.5.5 Therapy unit.** If provided, physical, speech, and occupational therapy units shall comply with Sections 1225.6.2 through 1225.6.4.

**1225.5.2.5.6 Barber/beauty room.** If provided, the barber/beauty room shall be a minimum of 120 square feet ( $11.15 \text{ m}^2$ ) with the least dimension of 10 feet ( $3.05 \text{ m}$ ).

**1225.5.2.5.7 Resident laundry facilities.** If provided, resident laundry facilities including washing and drying equipment may be provided for staff, family, or individual patient use for the laundering of patient's personal items. If provided they shall be readily accessible from each resident unit without requiring the user to enter another resident unit or floor, and may be shared between two resident units. These resident laundry facilities may utilize residential laundry equipment. Each resident laundry area shall contain a handwashing fixture.

#### 1225.5.2.6 STAFF SUPPORT AREA.

**1225.5.2.6.1 Staff lounge.** Staff lounge area(s) shall be provided. It may be shared by multiple resident units if the lounge is located so it is accessible without requiring the user to enter into or through any other resident unit.

**1225.5.2.6.2 Storage.** Lockable closets, drawers, or compartments shall be provided on the resident unit

for staff and may be located in the lounge for safe-keeping of staff's personal effects.

**1225.5.2.6.3 Staff toilet room.** Staff toilet room shall be provided conveniently located to each resident unit.

**1225.5.2.6.4 Multipurpose room.** At least one multipurpose room per skilled nursing facility shall be provided for conferences, meetings, and health education purposes, and shall accommodate the use of visual aids. This room shall have a minimum area of 120 square feet ( $11.15 \text{ m}^2$ ).

**1225.5.2.6.5 Conference room.** Conference or consultation room for patient and family use shall be provided and may be shared by more than two resident units if it is centrally located to each.

## 1225.6 OPTIONAL SERVICES.

**1225.6.1 General.** Waiting areas and access to optional services for outpatients shall accommodate the following:

**1225.6.1.1 Outpatient waiting rooms.** Waiting rooms for outpatients shall provide a seating area and space for wheelchairs, and have public corridor access to, or provisions for, public toilet room(s), drinking fountain, and telephone.

**Note:** One waiting area may serve more than one department or service.

**1225.6.1.2 Circulation.** If x-ray examinations are to be performed on outpatients, out patient access to the radiological spaces shall not traverse a nursing unit.

**Exception:** Satellite radiology, laboratory, pharmacy, and physical and occupational therapy space serving inpatients may be located in nursing units and inpatient treatment areas.

## 1225.6.2 PHYSICAL THERAPY SERVICE.

**1225.6.2.1 Area.** The minimum floor area for a physical therapy service shall be 300 square feet ( $27.87 \text{ m}^2$ ), with no dimensions less than 12 feet (3658 mm).

**1225.6.2.2 Toilet room(s).** Toilet room facilities shall be directly accessible and allow for patient transfer activities.

**1225.6.2.3 Equipment space.** See Title 22 for required equipment.

**1225.6.2.4 Handwashing fixture.** A minimum of one handwashing fixture shall be provided.

**1225.6.3 OCCUPATIONAL THERAPY SERVICE.** An occupational therapy service shall accommodate the requirements of Sections 1225.6.2.1, 1225.6.2.2 and 1225.6.2.4.

Storage space shall be provided.

**Note:** See Title 22 for required equipment, supplies, and adaptive devices.

**1225.6.4 SPEECH PATHOLOGY AND/OR AUDIOLOGY SERVICE.** At least one space free of ambient noise shall be provided. A handwashing fixture shall be provided.

**1225.6.5 SOCIAL WORK SERVICE.** Office space for privacy in interviewing, telephoning, and conferences shall be provided.

## 1225.6.6 SPECIAL TREATMENT PROGRAM SERVICE.

**1225.6.6.1 Location.** A special treatment program service providing therapeutic services to an identified mentally disordered population group shall be located in a distinct separate unit of the facility.

**1225.6.6.2 Nursing service.** The nursing service space shall comply with Section 1225.4.1.

**1225.6.6.3 Activity program.** The activity program space shall provide a minimum of 25 square feet ( $2.3 \text{ m}^2$ ) of dining and recreation space per bed.

**1225.6.6.4 Indoor and outdoor space.** Shall be designated for the special treatment program.

## SECTION 1226 [OSHPD 3] CLINICS

**1226.1 Scope.** The provisions of this section shall apply to outpatient clinical services of a hospital when provided in a freestanding building, primary care clinics, specialty clinics, and psychology clinics. Primary care clinics include free clinics, community clinics, employee clinics and optometric clinics. Specialty clinics include surgical clinics, chronic dialysis clinics, rehabilitation clinics and alternative birth centers (ABC).

**1226.2 Application.** All new buildings and additions, alterations or repairs to existing buildings, and conversion of space to a clinic use within existing buildings, subject to licensure by Licensing and Certification, California Department of Public Health, shall comply with applicable provisions of the California Electrical Code, California Mechanical Code, California Plumbing Code, California Fire Code, (Parts 3, 4, 5, and 9 of Title 24) and this section. OSHPD requirements apply to all facilities described above and are not dependent upon Occupancy Group designations.

**Exception:** See Section 1224.2.

**1226.2.1 Outpatient clinical services.** Hospitals providing outpatient clinical services and clinics licensed under Health and Safety Code Section 1200 providing services that are not covered by this section shall meet the applicable requirements in Section 1224.

**1226.2.2 Special services.** A general acute care hospital referenced in Health and Safety Code Section 1255 (d) (3) (E), that provides special services in conformance with Health and Safety Code Section 1255, shall meet all the provisions of Section 1224.28.3 in addition to Section 1226.2. The Office of Statewide Health Planning and Development (OSHPD) shall review any proposed construction or alteration for OSHPD compliance.

**1226.3 Definitions.** Refer to Section 1224.3.

**1226.4 General construction.** Clinics and outpatient clinical services under a hospital license shall comply with the following provisions wherever applicable.

**1226.4.1 Examination and treatment areas.**

**1226.4.1.1 Service spaces.** Refer to Section 1224.4.2.

**1226.4.1.2 Treatment spaces.** Refer to Section 1224.4.3.

**1226.4.1.3 Examination or treatment room.** Refer to Section 1224.4.4.1.

**1226.4.1.4 Airborne infection isolation exam/treatment room.** Refer to Section 1224.4.4.1.3.

#### 1226.4.2 Miscellaneous requirements.

**1226.4.2.1 Station outlets.** When provided, refer to Section 1224.4.6.1.

**1226.4.2.2 Gas and vacuum systems.** When provided refer to Section 1224.4.6.2.

**1226.4.2.3 Hyperbaric facilities.** When provided, refer to Section 1224.4.6.3.

**1226.4.2.4 Laboratories.** Refer to Section 1224.4.6.4.

**1226.4.2.5 Nurse call systems.** Refer to Section 1224.4.6.5.

#### 1226.4.3 Corridors.

**1226.4.3.1 Outpatient services.** Refer to Section 1224.4.7.3

**1226.4.3.2 Corridor width.** For clinics with bed/gurney patient(s) refer to Section 1224.4.7.1.

**1226.4.3.3 Light traffic.** Refer Section 1224.4.7.2.

**1226.4.3.4 Handrails.** For rehabilitation services space, refer to Section 1224.4.7.4.

**1226.4.3.5 Connections.** Refer to Section 1224.4.7.5.

#### 1226.4.4 Doors and door openings.

**1226.4.4.1 Toilet room doors.** Refer to Section 1224.4.8.1.

**1226.4.4.2 Pocket doors.** Refer to Section 1224.4.8.2.

#### 1226.4.5 Windows.

**1226.4.5.1 Window screens.** Refer to Section 1224.4.9.4.

**1226.4.5.2 Light and ventilation.** Refer to Section 1224.4.9.5.

#### 1226.4.6 Ceiling heights.

**1226.4.6.1 Minimum height.** For minimum ceiling height requirements, refer to Section 1224.4.10.1.

**1226.4.6.2 Minimum height with fixed ceiling equipment.** Refer to Section 1224.4.10.2.

#### 1226.4.7 Interior finishes.

**1226.4.7.1 Floor finishes.** Refer to Section 1224.4.11.1 and Table 1224.4.11.

**1226.4.7.1.1 Coved base.** Refer to Section 1224.4.11.1.1.

**1226.4.7.1.2 Wet cleaning.** Refer to Section 1224.4.11.1.3.

**1226.4.7.1.3 Airborne infection isolation exam/treatment room.** Refer to Section 1224.11.1.4.

#### 1226.4.7.2 Wall bases.

**1226.4.7.2.1 Material.** Refer to Section 1224.4.11.2.1.

**1226.4.7.2.2 Wet cleaning.** Refer to Section 1224.4.11.2.2.

**1226.4.7.3 Wall finishes.** Refer to Section 1224.4.11.3.

**1226.4.7.4 Ceilings.** Ceiling finishes shall comply with Section 1224.4.11.4 and Table 1224.4.11.

#### 1226.4.8 Elevators.

**1226.4.8.1 Elevator cab requirements.** Buildings over one story in height with accommodations or services for patients on floors without grade-level entrance shall provide at least one elevator in compliance with Section 3002.4.

**1226.4.8.2 Dimensions.** Elevators used for the routine transport of wheeled stretchers shall have minimum inside platform dimensions of 5 feet by 8 feet (1524 mm by 2438 mm) and a minimum clear door opening of 3 feet 8 inches (1118 mm).

**1226.4.9 Garbage, solid waste, medical waste and trash storage.** These facilities shall comply with the appropriate local health and environmental authorities' requirements, California Department of Public Health requirements for medical waste management, and comply with the following minimum requirements:

**1226.4.9.1 Location.** A location shall be provided for waste collection and storage with sufficient space based upon the volume of projected waste and length of anticipated storage. The location of compactors, balers, sharps containers, and recycling container staging at docks or other waste removal areas shall comply with Section 1224.4.2.

**1226.4.9.2 Enclosure.** A lockable room or screened enclosure of at least 25 square feet ( $2.32 \text{ m}^2$ ) shall be provided for the washing and cleaning of garbage containers and for the storage of garbage, trash and other solid wastes.

**Exception:** This amount of space may not be required by the enforcing agency if there is a proposed method of handling and storage which requires a lesser amount of space. Additional space may be required by the enforcing agency when special operations or collection and disposal methods result in greater than usual accumulation of solid wastes.

The room or screened enclosure shall include the following:

1. **Floor and curb.** A concrete floor with a curb and with a drain connected to the sewer.
2. **Water.** Steam or hot water and cold water supplies in accordance with the California Plumbing Code.
3. **Size.** A minimum floor area of not less than 25 square feet ( $2.32 \text{ m}^2$ ), the least dimension of which shall be 4 feet (1219 mm). This amount of space may not be required by the enforcing agency if there is proposed a method of handling, storage, or cleaning of containers which requires a lesser amount of space. Additional space may be required by the enforcing agency when special operations or collection and disposal methods

*result in greater than usual accumulation of solid wastes.*

**1226.4.9.3 Waste holding room.** As an alternative to the requirements in Section 1226.4.9.2, a holding room for medical waste and garbage may be provided.

**Exception:** This amount of space may not be required by the enforcing agency if there is a proposed method of handling and storage which requires a lesser amount of space. Additional space may be required by the enforcing agency when special operations or collection and disposal methods result in greater than usual accumulation of solid wastes.

The waste holding room shall comply with the following:

1. The waste holding room shall be a minimum of 25 square feet, with the least dimension of which is 4 feet.
2. The waste holding room shall have 100 percent exhaust ventilation.
3. All finishes in the waste holding room shall comply with the requirements in Section 1224.4.11.
4. The waste holding room shall have convenient access to an exterior door.

**1226.4.10 Compactors.** Trash compactor systems shall meet the drainage and wash-down requirements under Section 1226.4.9.2, Items 1 and 2.

**Exception:** If a dumpster system is proposed, operational procedures for handling and storage must be specifically approved by the local health officials.

**1226.4.11 Housekeeping room.** Refer to Section 1224.4.15.

**1226.4.12 Laundry and trash chutes.** Gravity-type laundry and trash chutes shall comply with Section 1224.4.16.

**1226.4.13 Support areas for examination and treatment rooms.**

**1226.4.13.1 Administrative center(s) or nurse station(s).** This area shall have space for counters and storage and shall have convenient access to handwashing fixtures (refer to Section 1224.3 for definition of handwashing fixture). It may be combined with or include centers for reception, charting and communication.

**1226.4.13.2 Medication station.** Provision shall be made for distribution of medications. This shall be done from a medicine preparation room or a self-contained medicine dispensing unit.

**1226.4.13.2.1 Medicine preparation room or area.** When provided, the entry of the medicine preparation room or area shall be under the visual control of the staff. This may be a part of the administrative center or nurse station and shall include all of the following:

1. Work counter

2. Sink

3. Lockable refrigerator

4. Convenient access to handwashing fixture

5. Locked storage for biologicals and drugs

When a medicine preparation room or area is to be used to store self-contained medicine dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine-dispensing units present.

**1226.4.13.2.2 Self-contained medicine-dispensing unit.** When provided, the location of a self-contained medicine-dispensing unit shall be permitted in the clean workroom or at the administrative center or nurses' station, provided there is adequate security for medications and adequate lighting to easily identify drugs. Convenient access to handwashing fixture shall be provided.

**1226.4.13.3 Clean utility room.** A clean utility room shall be provided. If the room is used for preparing patient care items, it shall contain:

1. Work counter
2. Handwashing fixture
3. Storage facilities for clean and sterile supplies

If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing fixture may be omitted. Soiled and clean utility rooms or holding rooms shall be separated and have no direct connection.

**1226.4.13.4 Soiled workroom or soiled holding room.** Soiled workroom or soiled holding room shall be provided and contain:

1. Clinic sink
- Exception:** For primary care clinics, a utility sink or patient toilet room equipped with a bedpan flushing device may be provided in lieu of a clinic sink. A utility sink may be used for soaking or rinsing and shall be provided as appropriate to the method of decontamination used.
2. Handwashing fixture
  3. Work counter
  4. Storage cabinets
  5. A designated area for waste receptacle(s)
  6. A designated area for soiled linen receptacle(s)

Where rooms are used for temporary holding of materials, provisions shall be made for separate collection, storage, and disposal of soiled materials. Soiled and clean utility rooms or holding rooms shall be separated and have no direct connection.

**1226.4.13.5 Sterile and pharmaceutical supply storage.** Separate storage for sterile supplies and pharmaceutical supplies shall be provided.

**1226.4.13.6 Sterilization facilities.** When provided, a sterilization facility shall meet the following applicable requirements:

**1226.4.13.6.1 Storage.** Each facility shall provide space for the storage of disposable sterile supplies or provide space for sterilization and disinfection equipment.

**Exception:** Facilities with contractual arrangements for outside autoclaving and sterilizing services.

**1226.4.13.6.2 Central sterile supply and sterilizing area.** When provided, rooms and spaces of the central supply and sterilizing area shall comply with the following:

1. **Soiled work area.** A receiving and gross cleaning area which shall contain work space and equipment for cleaning medical and surgical equipment and for disposal of or processing of soiled materials.
2. **Clean work area.** A clean work area which shall contain work space and equipment for sterilizing medical and surgical equipment and supplies.
3. **Sterilizing and equipment disinfection space.**
4. **Storage.** Space for sterile supplies and unsterile supplies.

**1226.4.13.6.3 Sterilizers.** When provided, all sterilizers and autoclaves which emit system steam exhaust shall be vented to the outside of the building. Such vents shall be independent from the plumbing vent system.

**Exception:** Small instrument sterilizers.

**1226.4.13.7 Nourishment room.** When provided, the nourishment room or area shall have all of the following:

1. Sink
2. Work counter
3. Refrigerator
4. Storage cabinets
5. Equipment for serving nourishment
6. A handwashing fixture, as defined in Section 1224.3, shall be located in the nourishment room or adjacent to the nourishment area.

#### 1226.4.14 Support areas for patients.

**1226.4.14.1 Patient toilet room(s).** Toilet room(s) with a lavatory shall be provided separate from public use toilet(s) and shall be located to permit access from patient care areas without passing through publicly accessible areas.

**Exception:** For primary care clinics where the facility contains no more than three examination and/or treatment rooms, the patient toilet room shall be permitted to serve outpatient waiting room(s).

**1226.4.14.2 Specimen and/or blood collection facilities.** When provided, refer to Section 1224.4.4.2. Use of patient toilet room(s) shall be permitted for specimen collection.

#### 1226.4.15 General support services and facilities.

**1226.4.15.1 Areas for off-site laundry services.** If linen is to be processed off site, the following shall be provided:

1. Soiled linen holding area or designated and dedicated area for soiled laundry cart.
2. Clean linen storage area that protects linen from soil or damage.

#### 1226.4.16 Public and administrative areas.

##### 1226.4.16.1 Public.

**1226.4.16.1.1 Reception.** A reception and information counter or desk shall be provided.

**1226.4.16.1.2 Outpatient waiting rooms.** Refer to Section 1224.4.5.

##### 1226.4.16.2 Administrative services.

**1226.4.16.2.1 Medical records storage.** Outpatient clinics shall provide a health record service which shall comply with the following:

1. Work area for sorting and recording records for either paper or electronic media.
2. Storage area for records for either paper or electronic media.

**1226.4.16.2.2 Equipment and supply storage.** General storage facilities for office supplies and equipment shall be provided.

#### 1226.4.17 Support areas for staff.

**1226.4.17.1 Staff toilet(s).** Provide staff toilet(s) in addition to and separate from, public and patient facilities. The areas shall contain toilet(s) and handwashing fixtures pursuant to the California Plumbing Code, Table 4-2.

**1226.4.17.2 Storage for employees.** Provide storage for staff personal effects with locking drawers or cabinets (may be individual desks or cabinets). Such storage shall be convenient to individual workstations and shall be staff controlled.

**1226.4.17.3 Staff lounge.** When provided, the lounge shall have adequate space to accommodate staff.

#### OUTPATIENT CLINICAL SERVICES OF A HOSPITAL

**1226.5 OUTPATIENT CLINICAL SERVICES OF A HOSPITAL.** A licensed hospital may elect to locate certain outpatient services in a freestanding outpatient clinical services building(s). To be considered a freestanding outpatient clinical services building the building must not be physically attached to a building in which inpatient services are provided. No more than 25 percent of the services provided in an outpatient clinical services building may be rendered to inpatients. Services that duplicate the basic services may be provided in freestanding building(s). These services, defined in Subsection (a) of the Health and Safety Code Section 1250,

*must be in excess of the basic services, necessary for hospital licensure, required to be located in a hospital building under OSHPD jurisdiction.*

*Outpatient clinical services of a hospital in a freestanding outpatient clinical services building shall comply with Sections 1226.4.2 through 1226.4.8 and the provisions of this section. Outpatient clinical services of a hospital that are not addressed in the provisions of Section 1226 shall comply with applicable provisions of Section 1224.*

#### **GENERAL SUPPORT AREAS FOR OUTPATIENT CLINICAL SERVICES - Requirements for all service types.**

##### **1226.5.1 Support areas for patients.**

**1226.5.1.1 Patient toilet room(s).** Refer to Section 1226.4.14.1.

**1226.5.1.2 Specimen and/or blood collection facilities.** When provided, refer to Section 1224.4.4.2.

##### **1226.5.2 General support services and facilities.**

**1226.5.2.1 Garbage, solid waste, medical waste, and trash storage.** Refer to Section 1226.4.9.

**1226.5.2.2 Housekeeping room.** Refer to Section 1224.4.15.

##### **1226.5.3 Public and administrative areas.**

###### **1226.5.3.1 Public area.**

**1226.5.3.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.5.3.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.5.3.1.3 Public toilet(s).** Refer to Section 1224.4.5.

**1226.5.3.1.4 Public telephone access.** Refer to Section 1224.4.5.

**1226.5.3.1.5 Drinking fountain(s).** Refer to Section 1224.4.5.

###### **1226.5.3.2 Administrative services.**

**1226.5.3.2.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

**1226.5.3.2.2 Equipment and supply storage.** Refer to Section 1226.4.16.2.2.

##### **1226.5.4 Support areas for staff.**

**1226.5.4.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.5.4.2 Storage for employees.** Refer to Section 1226.4.17.2.

#### **RADIOLOGICAL/IMAGING SERVICE SPACE**

**1226.5.5 Radiological/imaging service space.** When x-ray examination services, computerized tomography scanning, magnetic resonance imaging, ultrasound, and/or mammography services are provided, the radiological/imaging services space shall comply with the provisions of this section.

**1226.5.5.1 Support spaces for radiological/imaging services.** The following spaces are common to the imaging service area and are minimum requirements:

**1226.5.5.1.1 Patient toilet room(s).** In service spaces with procedure rooms that do not require dedicated patient toilets, provide a minimum of one patient toilet room within the service space, refer to Section 1226.4.14.1.

**1226.5.5.1.2 Outpatient change area.** A separate space shall be provided where outpatients change from street clothing. This shall include provisions for clothing storage, space for clothing change and gowning area. Dressing rooms shall be provided convenient to the imaging rooms.

**1226.5.5.1.3 Staff facilities.** In service space of three or more procedure rooms, staff toilet room(s) internal to the service space.

**1226.5.5.1.4 Handwashing fixtures.** Handwashing fixtures shall be located within the unit.

**1226.5.5.1.5 Imaging storage (active).** If imaging storage systems are used, provide a means of sorting and filing patient film or electronic media for immediate retrieval shall be provided.

**1226.5.5.1.6 Medication station.** Provision shall be made for locked storage of medications and drugs. Refer to Section 1226.4.13.2.

**1226.5.5.1.7 Areas for off-site laundry services.** Refer to Section 1226.4.15.1.

**1226.5.5.2 Radiation protection.** Radiation protection requirements for equipment refer to Section 1224.18.1.1.

**1226.5.6 X-ray examination services.** When provided, x-ray examination services space shall comply with the following:

1. X-ray room.
2. When shielded control alcove with protective view windows is provided, refer to Section 1224.18.1.1.
3. Fluoroscopy room, when provided, shall have a toilet room adjoining each fluoroscopy room, in addition to other toilet room facilities located adjacent to or in the immediate vicinity.
4. Space for processing images.
5. An office or other suitable area for viewing and reporting radiographic examination.

**1226.5.7 Computerized tomography (CT) scanning.** When provided, CT services space shall comply with the requirements of Section 1224.18.3.

**1226.5.8 Magnetic resonance imaging (MRI).** When provided, MRI services space shall comply with the requirements of Section 1224.18.4.

**1226.5.9 Ultrasound.** When ultrasound is provided, refer to Section 1224.18.5.

**1226.5.10 Mammography.** When mammography is provided, refer to Section 1224.18.6.

**GASTROINTESTINAL ENDOSCOPY**

**1226.5.11 Gastrointestinal endoscopy.** When provided, gastrointestinal endoscopy services space shall comply with Section 1224.39.3 and the provisions of this section:

**1226.5.11.1 Procedure Room(s).**

**1226.5.11.1.1 Space requirements.** Refer to Section 1224.39.3.1.1.

**1226.5.11.1.2 Handwashing fixture.** Refer to Section 1224.39.3.1.2.

**1226.5.11.2 Processing room.** Refer to Section 1224.39.3.2.

**1226.5.11.3 Pre-operative patient holding.** Refer to Section 1224.15.2.

**1226.5.11.4 Post-anesthesia recovery area.** Refer to Section 1224.16.

**1226.5.11.5 Communication system.** Refer to Section 1224.39.3.5.

**1226.5.11.6 Support areas for outpatient gastrointestinal endoscopy.**

**1226.5.11.6.1 Control station.** Refer to Section 1224.15.3.1.

**1226.5.11.6.2 Medication station.** Refer to Section 1226.4.13.2.

**1226.5.11.6.3 Soiled workroom.** Refer to Section 1224.15.3.7.

**1226.5.11.6.4 Clean utility room.** Refer to Section 1224.15.3.8.

**1226.5.11.6.5 Anesthesia workroom.** Refer to Section 1224.15.3.9.

**1226.5.11.6.6 Storage room(s) for equipment and supplies used in gastrointestinal endoscopy service space.** Refer to Section 1224.15.3.10.

**1226.5.11.6.7 Staff clothing change areas.** Refer to Section 1224.15.3.11.

**1226.5.11.6.8 Housekeeping room.** Refer to Section 1224.39.2, Item 7.

**1226.5.11.6.9 Cleanup room.** Refer to Section 1224.39.2, Item 4.

**1226.5.11.6.10 Sterile and pharmaceutical supply storage.** Refer to Section 1226.4.13.5.

**1226.5.11.7 Additional support areas for patients.**

**1226.5.11.7.1 Outpatient change area.** A separate space shall be provided where patients change out of their street clothing and are prepared for the procedure. This space shall include provisions for clothing storage, toilet room(s), sink, space for clothing change and gowning area.

**NUCLEAR MEDICINE**

**1226.5.12 Nuclear medicine.** When provided, nuclear medicine services space shall comply with Section 1224.34 and the provisions of this section:

**1226.5.12.1 Radiation protection.** When provided, refer to Section 1224.34.1.1.

**1226.5.12.2 Nuclear medicine room.** Refer to Section 1224.34.1.2.

**1226.5.12.3 Radiopharmacy.** When provided, refer to Section 1224.34.1.3.

**1226.5.12.4 Support areas for nuclear medicine services.**

**1226.5.12.4.1 Cleanup.** Refer to Section 1224.34.2.2.

**1226.5.12.4.2 Dose administration area.** Refer to Section 1224.34.2.5.

**1226.5.12.4.3 Holding.** Refer to Section 1224.34.2.6.

**1226.5.12.4.4 Patient dressing rooms.** Refer to Section 1224.34.2.7.

**1226.5.12.4.5 Patient toilet room(s).** Refer to Section 1224.34.2.8.

**1226.5.12.4.6 Staff toilet room(s).** Refer to Section 1224.34.2.9.

**1226.5.12.4.7 Handwashing fixtures.** Refer to Section 1224.34.2.10.

**1226.5.12.4.8 Control desk and reception.** Refer to Section 1226.5.3.

**1226.5.12.4.9 Clean linen storage.** A storage area for clean linen shall be provided.

**1226.5.12.4.10 Soiled and contaminated material.** Refer to Section 1224.34.2.13.

**1226.5.12.5 Radiotherapy service space.** When provided, radiotherapy service space shall comply with the following provisions of this section:

**1226.5.12.5.1 Radiation protection.** Refer to Section 1224.34.3.2.

**1226.5.12.5.2 Room sizes.** Refer to Section 1224.34.3.3.

**1226.5.12.5.3 General support area.** Refer to Section 1224.34.3.4.

**1226.5.12.6 Additional support areas for linear accelerator.**

**1226.5.12.6.1 Mold room.** Refer to Section 1224.34.4.1.

**1226.5.12.6.2 Block room.** Refer to Section 1224.34.4.2.

**1226.5.12.7 Additional support areas for cobalt room.**

**1226.5.12.7.1 Hot lab.**

**1226.5.12.8 High dose rate brachytherapy room.**

**CANCER TREATMENT/INFUSION THERAPY**

**1226.5.13 Cancer treatment/infusion therapy service space.** When provided, cancer treatment/infusion therapy service space shall comply with the provisions of this section:

**1226.5.13.1 Treatment area.**

**1226.5.13.1.1 Location.** Refer to Section 1224.39.4.2.1.

**1226.5.13.1.2 Nurses' station(s).** Refer to Section 1224.39.4.2.2.

## INTERIOR ENVIRONMENT

**1226.5.13.1.3 Individual patient treatment areas.** Refer to Section 1224.39.4.2.3.

**1226.5.13.1.4 Handwashing fixtures.** Refer to Section 1224.39.4.2.4.

**1226.5.13.1.5 Privacy.** Refer to Section 1224.39.4.2.5.

**1226.5.13.1.6 Medication dispensing.** Refer to Section 1224.39.4.2.6.

**1226.5.13.1.7 Examination room.** Refer to Section 1224.39.4.2.7.

**1226.5.13.1.8 Clean utility room.** Refer to Section 1224.39.4.2.8.

**1226.5.13.1.9 Soiled utility room.** Refer to Section 1224.39.4.2.9.

**1226.5.13.1.10 Nourishment station.** Refer to Section 1224.39.4.2.10.

**1226.5.13.1.11 Housekeeping room.** Refer to Section 1224.39.4.2.11.

**1226.5.13.1.12 Supplies.** Refer to Section 1224.39.4.2.12.

**1226.5.13.1.13 Storage.** Refer to Section 1224.39.4.2.13.

**1226.5.13.1.14 Clean linen storage.** Refer to Section 1224.39.4.2.14.

**1226.5.13.1.15 Patient storage.** Refer to Section 1224.39.4.3.2.

## PRIMARY CARE CLINICS

**1226.6 PRIMARY CARE CLINICS.** Primary care clinics and outpatient clinical services of a hospital providing services equivalent to a primary care clinic shall comply with Sections 1226.4.3 through 1226.4.8 and the provisions of this section.

### 1226.6.1 Examination and treatment areas.

**1226.6.1.1 Examination room(s).** Refer to Section 1224.4.4.1.

**1226.6.1.2 Treatment room(s).** Treatment room(s) for minor procedures (e.g. minor surgical procedures, casting), if provided, shall have a minimum area of 120 square feet ( $11.15 \text{ m}^2$ ), the least dimension of which shall be 10 feet (3048 mm), excluding such spaces such as vestibules and work counters, and shall meet the requirements in Section 1224.4.4.1.

### 1226.6.2 Support areas for examination rooms.

**1226.6.2.1 Administrative center or nurse station.** Refer to Section 1226.4.13.1.

**1226.6.2.2 Medication station.** Refer to Section 1226.4.13.2.

**1226.6.2.3 Clean utility room.** Refer to Section 1226.4.13.3.

**1226.6.2.4 Soiled workroom or soiled linen holding.** Refer to Section 1226.4.13.4.

### 1226.6.3 Support areas for patients.

**1226.6.3.1 Patient toilet room(s).** Refer to Section 1226.4.14.1.

**1226.6.3.2 Specimen collection and/or blood collection facilities.** When provided, refer to Section 1224.4.4.2.

### 1226.6.4 General support services and facilities.

**1226.6.4.1 Garbage, solid waste, medical waste and trash storage.** Refer to Section 1226.4.9.

**1226.6.4.2 Housekeeping room.** Refer to Section 1224.4.15.

## 1226.6.5 Public and administrative areas.

### 1226.6.5.1 Public area.

**1226.6.5.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.6.5.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.6.5.1.3 Public toilet(s).** Refer to Section 1224.4.5.

**1226.6.5.1.4 Public telephone access.** Refer to Section 1224.4.5.

**1226.6.5.1.5 Drinking fountain(s).** Refer to Section 1224.4.5.

### 1226.6.5.2 Administrative services

**1226.6.5.2.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

**1226.6.5.2.2 Equipment and supply storage.** Refer to Section 1226.4.16.2.2.

## 1226.6.6 Support areas for staff.

**1226.6.6.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.6.6.2 Storage for employees.** Refer to Section 1226.4.17.2.

## SURGICAL CLINICS

**1226.8 SURGICAL CLINICS.** Outpatient surgical clinics, and outpatient clinical services of a hospital providing services equivalent to a surgical clinic, shall comply with Sections 1226.4.2 through 1226.4.8 and the provisions of this section.

### 1226.8.1 Outpatient surgical service space.

**1226.8.1.1 Operating room(s).** Refer to Section 1224.39.2, Item 1.

**1226.8.1.2 Preoperative patient holding.** Refer to Section 1224.15.2.

**1226.8.1.3 Post-anesthesia recovery area.** Refer to Section 1224.16.

### 1226.8.2 Support areas for outpatient surgery.

**1226.8.2.1 Control station.** Refer to Section 1224.15.3.1.

**1226.8.2.2 Supervisor's office or station.** Refer to Section 1224.15.3.2.

**1226.8.2.3 Substerile areas.** When provided, refer to Section 1224.15.3.3.

**1226.8.2.4 Medication station.** Refer to Section 1226.4.13.2.

**1226.8.2.5 Scrub facilities.** Refer to Section 1224.15.3.5.

**1226.8.2.6 Clock.** Refer to Section 1224.15.3.6.

**1226.8.2.7 Soiled workroom.** Refer to Section 1224.15.3.7.

**1226.8.2.8 Clean utility room.** Refer to Section 1224.15.3.8.

**1226.8.2.9 Anesthesia workroom.** Refer to Section 1224.15.3.9.

**1226.8.2.10 Equipment storage room(s) for equipment and supplies used in outpatient surgery.** Refer to Section 1224.15.3.10.

**1226.8.2.11 Staff clothing change areas.** Refer to Section 1224.15.3.11.

**1226.8.2.12 Housekeeping room.** Refer to Section 1224.39.2, Item 7.

**1226.8.2.13 Cleanup room.** Refer to Section 1224.39.2, Item 4.

**1226.8.2.14 Sterile and pharmaceutical supply storage.** Refer to Section 1226.4.13.5.

**1226.8.2.15 Sterilization facilities.** Refer to Section 1226.4.13.6.

#### **1226.8.3 Support areas for patients.**

**1226.8.3.1 Patient toilet room(s).** Refer to Section 1226.4.14.1.

**1226.8.3.2 Outpatient change area.** A separate space shall be provided where patients change out of their street clothing and are prepared for the procedure. This space shall include provisions for clothing storage, toilet room(s), sink, space for clothing change and gowning area.

#### **1226.8.4 General support services and facilities.**

**1226.8.4.1 Garbage, solid waste, medical waste and trash storage.** Refer to Section 1226.4.9.

**1226.8.4.2 Areas for off-site laundry services.** Refer to Section 1226.4.15.1.

#### **1226.8.5 Public and administrative areas.**

##### **1226.8.5.1 Public area.**

**1226.8.5.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.8.5.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.8.5.1.3 Public toilet(s).** Refer to Section 1224.4.5.

**1226.8.5.1.4 Public telephone access.** Refer to Section 1224.4.5.

**1226.8.5.1.5 Drinking fountain(s).** Refer to Section 1224.4.5.

##### **1226.8.5.2 Administrative services**

**1226.8.5.2.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

#### **1226.8.6 Support areas for staff.**

**1226.8.6.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.8.6.2 Storage for employees.** Refer to Section 1226.4.17.2.

#### **CHRONIC DIALYSIS CLINICS**

**1226.9 CHRONIC DIALYSIS CLINICS.** Chronic dialysis clinics and outpatient clinical services of a hospital providing

services equivalent to a chronic dialysis clinic shall comply with Sections 1226.4.3 through 1226.4.8 and the provisions of this section.

#### **1226.9.1 Examination and treatment rooms.**

**1226.9.1.1 Examination room(s).** An examination room with a handwashing fixture shall be provided with a minimum clear floor area of 100 square feet ( $9.29 m^2$ ).

**1226.9.1.2 Treatment room(s).** When provided, refer to Section 1224.4.4.1.

**1226.9.1.3 Individual patient treatment areas.** Individual patient treatment areas shall contain at least 80 square feet ( $7.44 m^2$ ). There shall be at least a 4-foot (1219 mm) space around and between beds and/or lounge chairs. In addition, the following shall be provided:

1. **Location.** The treatment area may be an open area and shall be separate from administrative area and outpatient waiting room.

2. **Privacy.** An open unit shall be designed to provide visual privacy for each patient.

**1226.9.1.4 Reception.** Refer to Section 1226.4.16.1.1.

**1226.9.1.5 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.9.1.6 Bloodborne infection isolation room.** A minimum of one bloodborne infection isolation room of at least 120 square feet ( $11.15 m^2$ ) of clear floor space shall be provided for patients. This room shall contain a counter and handwashing fixture.

**1226.9.1.7 Airborne infection isolation exam/treatment room.** When provided, refer to Section 1224.4.4.1.3.

**1226.9.1.8 Home training.** When provided in the unit, a private treatment area of at least 120 square feet ( $11.15 m^2$ ) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain counter, handwashing fixture(s), and a separate drain for fluid disposal.

**1226.9.2 Support areas for examination and treatment rooms.**

**1226.9.2.1 Administrative center or nurse station.** Administrative center or nurse station shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations. In addition, refer to Section 1226.4.13.1 for nurses' station(s) requirements.

**1226.9.2.1.1 Handwashing fixtures.** Handwashing fixture(s) shall be located convenient to the administrative center or nurses' station and patient treatment areas. There shall be at least one handwashing fixture serving no more than four stations. These shall be uniformly distributed to provide equal access from each patient station. Refer to Section 1224.3 for the definition of a handwashing fixture.

**1226.9.2.2 Medication station.** Refer to Section 1226.4.13.2.

**1226.9.2.3 Clean utility room.** Refer to Section 1226.4.13.3.

**1226.9.2.4 Soiled workroom or soiled linen holding.** Refer to Section 1226.4.13.4.

**1226.9.2.5 Housekeeping room.** Provide adjacent to and for the exclusive use of the unit. In addition, In addition, this room shall be a minimum floor area of 15 square feet and shall include the following:

1. Service sink or floor receptor
2. Supply storage
3. Housekeeping equipment storage

**1226.9.2.6 Nourishment room.** When provided, refer to Section 1226.4.13.7.

**1226.9.2.7 Sterilization facilities.** When provided, refer to Section 1226.4.13.6.

**1226.9.3 Administrative services.** Provide office and clinical work space including the following:

**1226.9.3.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

**1226.9.3.2 Equipment and supply storage.** Refer to Section 1226.4.16.2.2.

**1226.9.4 Support areas for patients.**

**1226.9.4.1 Patient toilet room(s).** Provide patient toilet room(s) directly accessible from treatment area. The toilet shall be equipped with bedpan flushing attachment(s). Refer to Section 1226.4.14.1.

**1226.9.4.2 Patient storage.** Provide space for storage of patient clothing and personal items.

**1226.9.4.3 Specimen collection facilities.** When provided, refer to Section 1224.4.4.2.

**1226.9.5 General support services and facilities.**

**1226.9.5.1 Garbage, solid waste, medical waste and trash storage.** Refer to Section 1226.4.9.

**1226.9.5.2 Areas for off-site laundry services.** Refer to Section 1226.4.15.1.

**1226.9.5.3 Reprocessing room.** When dialyzers are reused, a reprocessing room is required and sized to perform the functions required and include one-way flow of materials from soiled to clean with provisions for a refrigerator for temporary storage of dialyzer, decontamination/cleaning areas, sinks, processors, computer processors and label printers, packaging area, dialyzer storage and disinfectants storage.

**1226.9.5.4 Repair room.** When required, an equipment repair and breakdown room shall be equipped with a handwashing fixture, deep service sink, work counter and storage cabinet. Provide water supply and drain connection for testing machines.

**1226.9.5.5 Mixing room.** Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring special dialysis solutions. The mixing room shall also include a sink, storage space and holding tanks.

**1226.9.5.6 Water treatment room.** The water treatment equipment shall be located in an enclosed room.

**1226.9.6 Support areas for staff.**

**1226.9.6.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.9.6.2 Storage for employees.** Refer to 1226.4.17.2.

## REHABILITATION CLINICS

**1226.10 REHABILITATION CLINICS.** Rehabilitation clinics and outpatient clinical services of a hospital providing services equivalent to a rehabilitation clinic shall comply with Sections 1226.4.3 through 1226.4.8 and the provisions of this section.

## SUPPORT AREAS FOR THERAPY SERVICES.

**1226.10.1 Support area for patients.**

**1226.10.1.1 Patient toilet room(s).** Refer to Section 1226.4.14.1.

**1226.10.2 General support.**

**1226.10.2.1 Garbage.** Refer to Section 1226.4.9.

**1226.10.2.2 Housekeeping.** Refer to Section 1224.4.15.

**1226.10.2.3 Areas for off-site laundry services.** Refer to Section 1226.4.15.1.

**1226.10.3 Public and administrative.**

**1226.10.3.1 Public area.**

**1226.10.3.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.10.3.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.10.3.1.3 Toilet(s).** Refer to Section 1224.4.4.5.

**1226.10.3.1.4 Drinking fountain.** Refer to Section 1224.4.4.5.

**1226.10.3.1.5 Telephone.** Refer to Section 1224.4.4.5.

**1226.10.3.2 Administrative services.** Provide office and clinical work space including the following:

**1226.10.3.2.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

**1226.10.3.2.2 Equipment and supply storage.** Refer to Section 1226.4.16.2.2.

**1226.10.4 Support areas for staff.**

**1226.10.4.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.10.4.2 Storage for employees.** Refer to Section 1226.4.17.2.

**REHABILITATION THERAPY SERVICE SPACES.**

**1226.10.5 Physical therapy service space.** A physical therapy service space shall be provided. The service space shall comply with the following provisions:

1. **Individual treatment area(s).** Refer to Section 1224.35.2, Item 1.
2. **Handwashing fixture(s).** Refer to Section 1224.35.2, Item 2.
3. **Exercise area.** Refer to Section 1224.35.2, Item 3.
4. **Clean linen and towel storage.** Refer to Section 1224.35.2, Item 4.
5. **Storage for equipment and supplies.** Refer to Section 1224.35.2, Item 5
6. **Separate storage for soiled linen, towels and supplies.** Refer to Section 1224.35.2, Item 6.

**1226.10.6 Occupational therapy service space.** When an occupational therapy service is provided, the service space shall comply with following provisions:

1. **Work areas and counters.** Refer to Section 1224.35.3, Item 1.
2. **Handwashing fixture(s).** Refer to Section 1224.35.3, Item 2.
3. **Storage for supplies and equipment.** Refer to Section 1224.35.3, Item 3.
4. **Area for teaching daily living activities.** Refer to Section 1224.35.3, Item 4.

**1226.10.7 Speech pathology and/or audiology service space.** When speech pathology and/ or audiology service(s) is provided, the service space shall comply with the following provisions:

1. **Interview, consultation and treatment space.** Refer to Section 1224.35.4, Item 1.
2. **Waiting area.** Refer to Section 1224.35.4, Item 2.
3. **Handwashing fixture.** Refer to Section 1224.35.4, Item 3.
4. **Testing unit.** If an audiology service is provided. Refer to Section 1224.35.4, Item 4.

**ALTERNATIVE BIRTHING CLINICS**

**1226.11 ALTERNATIVE BIRTHING CLINICS.** Alternative birthing clinics and outpatient clinical services of a hospital providing services equivalent to alternative birthing clinics shall comply with Sections 1226.4.3 through 1226.4.8 and the provisions of this section:

**1226.11.1 Birthing service space.**

**1226.11.1 Birthing room.** A birthing room shall have a minimum clear floor area of 200 square feet (18.58 square meters), including the newborn care area. A birthing room shall have a minimum clear dimension of 12 feet (3658 mm). The maximum number of beds per room shall be one.

**1226.11.1.2 Location.** Birthing rooms shall be located out of the path of unrelated traffic and under direct supervision of the facility staff.

**1226.11.1.3 Nurse call system.** A nurse call system shall be located in the birthing room which will alert the nearest continually staffed administrative center or nurses' station. Refer to Section 1224.4.6.5 for requirements.

**1226.11.1.4 Hand-washing stations.** A handwashing fixture, as defined in Section 1224.3, shall be located within or directly outside the room. If the fixture is located within the room, the fixture may be screened or within openable casework.

**1226.11.1.5 Lighting.** Lighting capable of 1076 lux (100 footcandles) at working surfaces shall be provided. Dimmer switches may be used.

**1226.11.1.6 Window.** Each birthing room shall have an outside window. Refer to Sections 1224.4.9.4 and 1224.4.9.5.

**1226.11.1.7 Privacy.** Windows or doors within a normal sightline that would permit observation into the room shall be arranged or draped, as necessary, for mother and newborn privacy.

**1226.11.1.8 Newborn care area.** When provided, a separate newborn care area shall be provided that is in addition to the birthing room.

**1226.11.1.9 Examination room.** When provided, the examination room shall meet the requirements of Section 1224.4.4.

**1226.11.2 Support areas for birthing services.**

**1226.11.2.1 Administrative center or nurse station.** Refer to Section 1226.4.13.1.

**1226.11.2.2 Medication station.** Refer to Section 1226.4.13.2.

**1226.11.2.3 Clean utility room.** Refer to Section 1226.4.13.3.

**1226.11.2.4 Soiled utility or soiled holding room.** Refer to Section 1226.4.13.4.

**1226.11.2.5 Crash cart space.** Space for storing crash cart shall be provided.

**1226.11.2.6 Clean-up room.** Each birthing room shall have access to a clean-up room with a handwashing fixture and work space which is separate from any sterilizing facilities. The clean-up room shall provide 24 square feet (2.23 m<sup>2</sup>) per birthing room up to eight rooms, with no dimensions less than 6 feet (1829 mm).

**1226.11.2.7 Ice-making equipment.** Each facility shall have equipment to provide ice for treatments and nourishment. Ice-making equipment shall be permitted in the clean utility or the nourishment room/area. Ice intended for human consumption shall be provided in the nourishment station and shall be served from self-dispensing ice-makers.

**1226.11.2.8 Nourishment room or area.** When provided, refer to Section 1226.4.13.7.

**1226.11.2.9 Medical gas outlets.** When provided, oxygen and suction capabilities may be portable or piped.

#### **1226.11.3 Support areas for mother and newborn.**

**1226.11.3.1 Patient toilet room(s).** Each birthing room shall have direct access to a private toilet room with lavatory, shower or tub and nurse call system. Facilities for cleaning bedpans shall be provided in the toilet room.

#### **1226.11.4 General support services and facilities.**

**1226.11.4.1 Housekeeping room.** Refer to Section 1224.4.15.

**1226.11.4.2 Garbage, solid waste, medical waste and trash storage.** Refer to Section 1226.4.9.

**1226.11.4.3 Areas for off-site laundry services.** Refer to Section 1226.4.15.1.

#### **1226.11.5 Public and administrative areas.**

##### **1226.11.5.1 Public area.**

**1226.11.5.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.11.5.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.11.5.1.3 Public toilet(s).** Refer to Section 1224.4.5.

**1226.11.5.1.4 Public telephone.** Refer to Section 1224.4.5.

**1226.11.5.1.5 Drinking fountain.** Refer to Section 1224.4.5.

##### **1226.11.5.2 Administrative services.**

**1226.11.5.2.1 Medical records storage.** Refer to Section 1226.4.16.2.1.

**1226.11.5.2.2 Equipment and supply storage.** Refer to 1226.4.16.2.2.

#### **1226.11.6 Support areas for staff.**

**1226.11.6.1 Staff toilet(s).** Refer to Section 1226.4.17.1.

**1226.11.6.2 Storage for employees.** Refer to Section 1226.4.17.2.

**1226.11.6.3 Staff lounge.** Refer to Section 1226.4.17.3.

**1226.11.6.4 Staff clothing change area.** When provided, a changing room with shower shall be provided for staff to change into work attire.

#### **PSYCHOLOGY CLINICS**

**1226.12 PSYCHOLOGY CLINICS.** Psychology clinics and outpatient clinical services of a hospital providing services equivalent to a psychology clinic shall comply with Sections 1226.4.3 through 1226.4.8 and the provisions of this section.

Psychology clinics shall provide at least an interview room, consulting room and group therapy room.

#### **1226.12.1 Public and administrative area.**

##### **1226.12.1.1 Public area.**

**1226.12.1.1.1 Reception.** Refer to Section 1226.4.16.1.1.

**1226.12.1.1.2 Outpatient waiting room.** Refer to Section 1224.4.5.

**1226.12.1.1.3 Public toilet(s).** Refer to Section 1224.4.5.

**1226.12.1.1.4 Drinking fountain.** Refer to Section 1224.4.5.

**1226.12.1.1.5 Public telephone.** Refer to Section 1224.4.5.

#### **1226.12.1.2 Administrative Area.**

**1226.12.1.2.1 Medical Records storage.** Refer to Section 1226.4.16.2.1.

**1226.12.1.2.2 Equipment and supply storage.** Refer to Section 1226.4.16.2.2.

### **SECTION 1227 [OSHPD 4] CORRECTIONAL TREATMENT CENTERS**

**1227.1 Scope.** The provisions of this section shall apply to correctional treatment centers.

**1227.2 Application.** New buildings and additions, alterations or repairs to existing buildings subject to licensure shall comply with applicable provisions of the California Electrical Code, California Mechanical Code, California Plumbing Code, and California Fire Code (Parts 3, 4, 5, and 9 of Title 24) and this section.

#### **1227.3 Definitions.**

**BASIC SERVICES** for correctional treatment centers are those services required for licensure as a correctional treatment center, including medical, surgical, psychiatrist, psychologist, nursing, pharmacy and dietary. See "Optional services."

**HAND WASHING FIXTURE** is a special application sink having a water supply spout mounted so the discharge point is at least 5 inches (127 mm) above the fixture rim and equipped with hot and cold supply controls not requiring direct contact of the hands for operation. The fixture cannot be equipped with an aerator and wrist or elbow blade handles. Gooseneck spouts shall not be used in correctional treatment centers.

**LICENSING AGENCY** is the California Department of Public Health.

**OPTIONAL SERVICES** are inpatient or outpatient services which are not required to be provided by law or regulation for licensure. An optional service, when provided, must accommodate the provisions of this section. See "Basic services."

**OUTPATIENT SERVICE** is an organizational unit of the correctional treatment center which provides nonemergency health care services to patients.

#### **1227.4 GENERAL CONSTRUCTION.**

**1227.4.1 Services/systems and utilities.** Correctional treatment centers shall comply with this section.

**1227.4.1.1 Oxygen, vacuum and medical air.** Correctional treatment centers shall comply with the requirements of Section 1224.4.6 wherever applicable.

**1227.4.2 Service spaces.** Spaces for dietary, laundry, morgue, ambulance entrance, receiving areas, power plants, mechanical equipment, incinerator, garbage can cleaning, automobile parking and storage areas for garbage, trash and medical gases shall be located and constructed to minimize noise, steam, odors and hazards in patient care areas and bedrooms.

**1227.4.3 Treatment spaces.** Radiology, laboratory, pharmacy and physical therapy spaces shall not be located in nursing units, surgical units, perinatal units, nursery areas, central sterilization rooms, food service areas, power plants, mechanical equipment rooms, maintenance shops, general storage, laundry, employees' dressing or housekeeping facilities.

**1227.4.4 Exam room.** If an exam room is provided, it shall have a minimum clear floor area of 80 square feet ( $7.43 \text{ m}^2$ ), the least dimension of which shall be 8 feet (2438 mm).

**1227.4.5 Treatment room.** Unless specified elsewhere, if a treatment room is provided, it shall have a minimum clear floor area of 120 square feet ( $11.15 \text{ m}^2$ ), the least dimension of which shall be 10 feet (3048 mm). A minimum of 3 feet (914 mm) is required between the sides and foot of the bed/gurney/table and any wall or other fixed obstruction. The room shall contain an examination light, a work counter for medical equipment, a handwashing fixture, cabinets, medication storage and counter for writing or electronic documentation.

## 1227.5 CORRIDORS.

**1227.5.1 Width.** The minimum width of corridors shall be 8 feet (2438 mm).

**Exception:** Patient-care corridors in correctional treatment centers for psychiatric care of patients who are not bedridden shall have a minimum clear and unobstructed width of 6 feet (1829 mm). For the purpose of this section, bedridden patients shall be defined as patients confined to beds who would be transported or evacuated in beds or litters.

**1227.5.2 Service corridors width.** Service corridors with anticipated light traffic volume for nonpatient use may be reduced to a width of 5 feet (1524 mm) if approved by the enforcing agency.

**Exception:** Corridors in administrative and business areas may be reduced to a width of 44 inches (1118 mm).

**1227.5.3 Handrails.** Corridors for patient traffic in areas providing skilled nursing, intermediate, care or rehabilitation services shall be furnished with a handrail on both sides at a height not less than 30 inches (762 mm) or greater than 36 inches (914 mm).

**1227.5.4 Connections.** Corridor systems shall connect all patient rooms and essential services.

## 1227.6 DOORS AND DOOR OPENINGS.

**1227.6.1 Toilet room doors.** Doors to toilet rooms shall have an opening of not less than 32 inches (813 mm) clear in width and shall be equipped with hardware which will permit the door to swing outward or in a manner to negate the need to

push against a patient who may have collapsed within the toilet room.

**1227.6.2 Pocket doors.** Pocket sliding doors are not permitted.

**Exception:** Doors not serving as exit doors from administration areas.

**1227.6.3 Door view windows.** Doors to patient bedrooms shall be provided with a view window with a minimum area of 288 square inches (0.186 square meters). Window sill height shall not be higher than 42 inches (1067 mm) from the floor.

## 1227.7 WINDOWS AND SCREENS.

**1227.7.1 Natural light.** Rooms approved for the housing of patients shall be provided with natural light by means of glazed openings.

**1227.7.2 Screens.** When windows are operable, they shall be provided with insect screens of 16 meshes to the inch.

**1227.7.3 Light and ventilation.** All portions of a building used by patients, personnel or other persons shall be provided with artificial light and a mechanically operated ventilating system as specified in the California Electrical Code and the California Mechanical Code.

**1227.7.4 Patient viewing windows.** Each patient bedroom shall be provided with viewing windows from the corridor to allow full and unobstructed visual observation of the patient.

## 1227.8 CEILING HEIGHTS.

**1227.8.1 Minimum height.** The minimum height of ceilings shall be 8 feet (2438 mm).

**Exception:** Closet, toilet rooms and bathroom minimum ceiling heights shall not be less than 7 feet (2134 mm).

**1227.8.2 Minimum height with fixed ceiling equipment.** Rooms containing ceiling-mounted, major fixed equipment or ceiling-mounted surgical light fixtures shall have ceiling heights to accommodate the equipment or fixtures and their normal movement.

## 1227.9 INTERIOR FINISHES

### 1227.9.1 Floor finishes.

**1227.9.1.1 Floor finishes.** Shall be smooth, waterproof and durable.

**Exception:** Upon written appropriate documented request, the enforcing agency may grant approval of the installation of carpet. See Table 1224.4.11.

**1227.9.1.2 Resilient flooring.** If used in toilet and bathing rooms, shall be continuous and extend upward onto the walls at least 5 inches (127 mm).

### 1227.9.2 Wall bases.

**1227.9.2.1 Materials and installation.** The material and textures of bases and the installation thereof shall be such as to minimize dust-catching surfaces, moisture, infiltration and the harboring of vermin.

**Exception:** In locations where carpet is permitted as a floor finish material, the use of carpeted base

(coved or strip base) up to a maximum height of 5 inches (127 mm) is also permissible.

**1227.9.2.2 Wood bases.** Wood bases are prohibited except in administration departments and other offices described in Section 1227.16.

**Exceptions:** Wall bases in kitchens, operating rooms, delivery rooms, emergency operating rooms, cast rooms, special procedure rooms and other areas which are subject to wet cleaning methods shall be made integral and coved with the floor, and constructed without voids at the intersection of floor and wall surfaces.

**1227.9.3 Walls.** Interior wall finishes shall be smooth, washable and durable.

**1227.9.4 Ceilings.** Ceiling finishes shall be in compliance with Table 1224.4.11.

**Exceptions:** Walls and ceiling finish requirements do not apply to boiler rooms, mechanical equipment rooms, administration departments, other offices, enclosed stairways, maintenance shops and similar spaces.

#### 1227.10 ELEVATORS.

**1227.10.1** Patient elevators shall have minimum inside platform dimensions of 5 feet by 8 feet (1524 mm by 2438 mm) and a minimum clear door opening of 4 feet, 0 inches (1118 mm).

**1227.10.2** Passenger elevators shall have minimum inside platform dimensions of 4 feet, 8 inches by 7 feet, 4 inches (1422 mm by 2236 mm).

**1227.10.3** Buildings over one story in height with accommodations or services for patients on floors without grade level entrance shall provide at least one passenger or patient elevator.

**1227.10.4** If bed patients are accommodated on one or more floors, other than the main entrance floor or where operating rooms or delivery rooms are above or below the main entrance floor, at least one patient elevator shall be provided.

**1227.10.5** At least one patient elevator and one service elevator shall be provided in correctional treatment centers with a capacity of 60 to 149 beds on floors other than the main entrance floor.

**1227.10.6** At least one patient elevator, one passenger elevator and one service elevator shall be provided in hospitals with a capacity of 150 or more beds on floors other than the main entrance floor.

**1227.10.7** If elevators in the correctional institution meet the above size requirements and are easily accessible, the elevators need not be duplicated in the correctional treatment centers.

**1227.11 GARBAGE-SOLID WASTE AND TRASH STORAGE.** Rooms or screening enclosures shall be provided for the washing and cleaning of garbage containers and for the storage of garbage, trash, and other solid wastes. Such rooms or screening enclosures shall include the following:

1. A concrete floor with a curb and with a drain connected to the sewer.
2. Steam or hot-water and cold-water supply.
3. A minimum floor area of .5 square feet (0.046 m<sup>2</sup>) per bed, but not less than 25 square feet (2.32 m<sup>2</sup>), the least dimension of which shall be 4 feet (1219 mm).
4. A method of limiting access to the material except by authorized persons.

#### BASIC SERVICES

##### 1227.12 NURSING SERVICE SPACE.

**1227.12.1 Patient bedrooms.** Patients shall be accommodated only in rooms with the following minimum floor area, exclusive of toilet rooms, wardrobes, entrance vestibules, and fixed furnishings or equipment.

1. Single-patient rooms: 110 square feet (10.22 m<sup>2</sup>).
2. Multi-patient rooms: 80 square feet (7.43 m<sup>2</sup>) per bed.

**1227.12.2 Distance.** A minimum distance of 3 feet (914 mm) shall be provided between beds and 4 feet (1219 mm) between the foot of beds and walls or fixed objects in multi-patient rooms, and 3 feet (914 mm) in single-patient rooms.

**1227.12.3 Airborne infection isolation rooms.** Single rooms shall be provided for the isolation of patients with airborne communicable disease at a ratio of one room for each 35 beds, or major fraction thereof. At least one airborne infection isolation room shall be provided. Airborne infection isolation rooms shall be labeled with the words "Airborne Infection Room" on or adjacent to the anteroom side of the door between the isolation room and the anteroom.

**1227.12.3.1 Alternates.** Alternate designs for modifications to isolation rooms in operation prior to the effective date of this section may be utilized when it can be demonstrated that the alternate design meets performance requirements, without compromising any health or life-safety requirement.

**1227.12.3.2 Anteroom doors.** Airborne infection isolation room(s) shall have self-closing and latching devices on all anteroom doors.

**1227.12.3.3 Anteroom.** A separate anteroom shall be provided between the airborne infection isolation room and the corridor, which shall constitute the primary entrance to the negative pressure isolation room. This anteroom shall have a handwashing fixture, work counter at least 3 feet (914 mm) long, cabinets and space to gown and to store clean and soiled materials. There shall be a view window from the anteroom to the isolation room and means to allow for airflow from the anteroom into the negative pressure isolation room. Doors shall be aligned to allow large equipment to be wheeled into the airborne infection isolation room unless a secondary door complying with Section 1227.12.3.4 is provided. One anteroom may serve no more than two airborne infection rooms.

**1227.12.3.4 Secondary entry.** When a secondary entry is provided directly from the corridor to the negative-pressure isolation room, secondary doors shall be pro-

vided with locking devices which are readily openable from the room side and which are readily openable by the facility staff on the other side. When key locks are used on isolation rooms, keys shall be located at the nurses' station in a prominent readily accessible location.

**1227.12.3.5 Adjoining toilet facilities.** Each isolation room shall have its own toilet room facilities with an emergency nurse call system, a lavatory, a shower providing a seat or a space for a shower chair and a toilet equipped with a bedpan flushing attachment with a vacuum breaker.

**1227.12.3.6 Sealed-tight room.** Airborne infection isolation room perimeter walls, ceiling, floors, doors and penetrations shall be sealed tightly to minimize air infiltration from the outside or from other spaces.

**1227.12.4 Protective environment rooms.** Protective environment rooms for the protection of certain immunosuppressed patients may be provided by the facility. Protective environment rooms shall be labeled "Protective Environment Room" on or adjacent to the anteroom side of the door between the isolation room and the anteroom.

**1227.12.4.1 Anteroom doors.** Airborne infection isolation room(s) shall have self-closing and latching devices on all anteroom doors.

**1227.12.4.2 Anteroom.** A separate anteroom shall be provided between the protective environment room and the corridor or adjoining space which shall constitute the only entrance to the protective environment isolation room. This anteroom shall have a handwashing fixture, work counter at least 3 feet (914 mm) long, cabinets and space to gown and to store clean and soiled materials. There shall be a view window from the anteroom to the positive-pressure isolation room. There shall be means to allow for airflow from the protective environment room into the anteroom. Anteroom doors shall be aligned so that large equipment can be wheeled into the isolation room. One anteroom may serve no more than one protective environment room.

**Exception:** Alternate designs for protective environment rooms, without individual anterooms, may be approved by the enforcement agency when it can be demonstrated that the alternate design meets the requirements of the California Mechanical Code and does not compromise or alter any health or fire-protection component, assembly or system.

**1227.12.4.3 Toilet room(s).** Adjoining toilet room facilities shall meet the requirements of Section 1227.12.3.5.

**1227.12.4.4 Sealed-tight room.** Protective environment room perimeter walls, ceiling, floors, doors and penetrations shall be sealed tightly to minimize air infiltration from the outside or from other spaces.

**1227.12.5 Identification.** Each patient room shall be labeled with an identification number, letter or combination of the two.

#### 1227.12.6 Observation rooms.

**1227.12.6.1 Observation rooms.** Provide for disturbed/special patients at a ratio of one room for each 30 beds or major fraction thereof. At least one observation room shall be provided in each nursing service unit.

**1227.12.6.2 Viewing windows.** Observation rooms shall be provided with viewing windows to allow full and unobstructed visual observation of the patient. They shall be located near the nurses' station and toilet room facilities.

**1227.12.6.3 Appendages and equipment.** Rooms shall be free of appendages and equipment which could facilitate suicide or self-mutilation.

**1227.12.7 Nurses' station.** A nurses' station shall be provided within each nursing unit.

**1227.12.7.1 Components.** Nurses' stations shall be provided with a cabinet, a desk, space for records, a bulletin board, a telephone, and a specifically designated and lockable and illuminated medicine storage compartment, and a handwashing fixture. If a separate medicine room is provided, it shall have a lockable door and a medicine sink. This sink cannot replace the required nurses' station handwashing fixture.

**1227.12.7.2 Size.** Nurses' stations serving 25 or less beds shall have a minimum floor area of 100 square feet (9.29 m<sup>2</sup>). Nurses' stations servicing more than 25 beds shall have a minimum floor area of 125 square feet (11.6 m<sup>2</sup>). The minimum dimension of any nurses' station shall not be less than 8 feet (2438 mm).

**1227.12.7.3 Distance.** The distance between the nurses' station entrance and the center of the doorway of the most remote patient bedroom shall not exceed 90 linear feet (27432 mm).

**Exception:** This section does not preclude designs based on primary nursing concepts incorporating more than one single nursing station of less than 100 square feet (9.29 m<sup>2</sup>) each and an additional work space or station for unit clerk/receptionist junctions.

**1227.12.7.4 Correctional officer.** A separate space for the correctional officer may adjoin the nurses' station but shall not be included in the minimum square footage requirement for a nurses' station.

**1227.12.8 Utility rooms.** Utility rooms shall be provided in each nursing unit. Soiled and clean utility or holding rooms shall be separated and have no direct connection.

**1227.12.8.1 Clean utility room.** Clean utility rooms shall contain a work counter, handwashing fixture and storage facilities unless the room is used only for storage and holding as part of a system for distribution of clean and sterile supplies, in which case the work counter and handwashing fixture may be omitted.

**1227.12.8.2 Soiled workroom or soiled holding room.** Soiled utility rooms shall contain a flushing-rim clinical sink or equivalent flushing-rim device, handwashing fixture, work counter, waste receptacles and linen

hampers unless the room is used only for the temporary holding of soiled materials, in which case the flushing-rim clinical sink, handwashing fixture and work counter may be omitted. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided.

**1227.12.9 Treatment and exam rooms.** If treatment rooms or exam rooms are provided, they shall comply with Sections 1227.4.4 and 1227.4.5.

**1227.12.10 Toilet and bath facilities.** Separate toilet room facilities shall be provided for the use of patients and personnel.

**1227.12.10.1 Bathroom facilities.** Provide for patients in the nursing unit in at least the following ratios:

Bathtubs or showers                    1:12 patients

(Minimum one bathtub on each floor providing skilled nursing or intermediate care services)

Lavatories                                1:8 patients

(Fixtures shall be equipped without aerators and may have conventional controls. Gooseneck spouts shall not be used)

Toilets                                    1:6 patients

Fixtures serving individual patient rooms shall not be considered as meeting the required ratios for bedrooms not served by individual adjoining toilet rooms or bathrooms.

Changes in these ratios for wards or units in which bed patients only are to be cared for may be permitted by the enforcing agency.

**1227.12.11 Patient/nurse call system.** A patient/nurse call system shall be provided in compliance with Table 1224.4.6.5 and the provisions of Section 517.123 of the California Electrical Code.

### 1227.13 PHARMACEUTICAL SERVICE SPACE.

**1227.13.1 Licensed pharmacy.** A licensed pharmacy shall be provided and shall comply with the provisions of Section 1250.

**1227.13.1.1 Entrance and waiting.** If the pharmacy dispenses directly to inmates from the correctional institution, an entrance and a waiting area separate from the inpatient areas shall be provided.

### 1227.14 DIETETIC SERVICE SPACE.

**1227.14.1 Dietetic service space.** The dietetic service space shall accommodate the provisions of Section 1225.4.2.

#### Exceptions:

- Unless the dietetic service in the correctional institution is found acceptable to the licensing agency.

- A contractual arrangement for dietetic services with another health facility is acceptable to the licensing agency.

**1227.15 OFFICES.** Office spaces shall be provided for the provisions of nursing, physician, psychiatric and psychological services.

**1227.15.1 Consultation/interviews.** Consultation/interview rooms shall be provided.

**1227.15.2 Conference/group activities.** Separate rooms or spaces shall be provided for conferences and group activities.

**Exception:** If conference room or space is available to the correctional treatment facility staff in the correctional institution, this room or space need not be duplicated.

### 1227.16 ADMINISTRATION SPACE.

**1227.16.1 Administration.** An administration area shall be provided which shall provide for the following functions:

- Waiting area.
- Offices for the administrator and clerical personnel.

**1227.16.2 Records.** Spaces shall be provided which accommodate the following functions:

- Work area for sorting and recording records, for either paper or electronic media.
- Secure storage area for medical records, for either paper or electronic media.

### 1227.17 CENTRAL STERILE SUPPLY.

**1227.17.1 Minimum requirements.** A central supply and sterilizing area shall be provided. Rooms and spaces shall accommodate the following services and equipment:

- Soiled work area. A receiving and gross cleaning area which shall contain workspace and equipment for cleaning medical and surgical equipment and for disposal of or processing of soiled material.
- Clean work area. A clean work area which shall contain work space, and equipment for sterilizing medical and surgical equipment and supplies.
- Sterilizing space.  
**Exception:** Items 1 through 3 do not apply to facilities with contractual arrangements for outside autoclaving and sterilizing services.
- Storage. Space for sterile supplies and unsterile supplies.

**1227.17.2 Sterilizers and autoclaves.** All sterilizers and autoclaves which emit steam exhaust shall be vented to the outside of the building. Such vents shall be independent from the plumbing vent system.

**Exception:** Small instrument sterilizers.

**1227.18 STORAGE.**

**1227.18.1 General storage.** Correctional treatment centers shall provide combined general and specialized storage space in accordance with the following:

1–10 beds	120 square feet ( $11.15 \text{ m}^2$ ) minimum
11–100 beds	12 square feet ( $1.11 \text{ m}^2$ ) per bed
over 100 beds	1,200 square feet ( $111.48 \text{ m}^2$ ) plus 5 square feet ( $0.46 \text{ m}^2$ ) per bed for each bed over 100

**1227.18.2 Specialized storage.** Specialized storage spaces shall include the following:

1. **Linen.** Separate and enclosed facilities for clean and soiled linen in each nursing unit. The clean linen storage space shall have a minimum area of 10 square feet ( $0.93 \text{ m}^2$ ) and may be within the clean utility room. The soiled linen collection space shall have an area of no less than 10 square feet ( $0.93 \text{ m}^2$ ), and may be within the soiled utility room.
2. **Supply.** One supply storage space having a minimum area of 15 square feet ( $1.39 \text{ m}^2$ ) shall be provided in each nursing unit. Supply storage may be within the clean utility room used only as part of a system for distributing clean and sterile supplies.
3. **Wheelchairs.** A room or space shall be provided in each nursing unit for wheelchairs and stretchers. The wheelchair and stretcher space shall have a minimum area of 15 square feet ( $1.39 \text{ m}^2$ ).
4. **Storage.** Sterile and unsterile supplies shall be stored separately.

**1227.19 EMPLOYEE DRESSING ROOMS AND LOCKERS.**

**1227.19.1 Minimum facilities.** Correctional treatment centers shall provide the following:

1. **Dressing rooms.** Separate dressing rooms for male and female personnel with lockers, lavatory and toilet(s).

**Exception:** If provided for the correctional treatment center staff in adjacent correctional institutions, dressing rooms and lockers need not be duplicated.

**1227.20 HOUSEKEEPING ROOM.**

**1227.20.1** A securely lockable housekeeping room with service sink and supply storage spaces shall be provided in each nursing unit.

**OPTIONAL SERVICES**

**1227.21 SERVICE SPACES.** Service spaces, such as laboratory, radiology and any other services approved by the licensing agency, shall comply with the applicable space requirements of Sections 1224 and 1225. Service spaces shall also comply with applicable provisions of the California Building Standards Administrative Code (Part 1).

**1227.22 OUTPATIENT SERVICES.** The following shall be provided or made available to a outpatient service space.

**1227.22.1 Waiting.** Waiting area(s) shall be provided with access to toilet room facilities and a drinking fountain both meeting the requirements of Sections 1231.3.1, 1231.3.2 and 1231.3.3.

**1227.22.1.1 Holding cell.** If a temporary holding cell or room is used for this purpose, it shall comply with Section 1231.2.2.

**Exception:** The minimum floor area shall be 80 square feet ( $7.43 \text{ m}^2$ ).

**1227.23 24-HOUR MENTAL HEALTH CARE SERVICES.**

**1227.23.1 Program/dining space.** Provide within the Correctional Treatment Center for use by mental health treatment program patients, as is consistent with security requirements. Program/dining space shall be provided with a minimum floor area of 30 square feet ( $2.79 \text{ m}^2$ ) per patient served at a given time.

**1227.23.2 Mental health treatment.** Correctional treatment centers providing a mental health treatment program shall include one safety room for every 30 mental health treatment program beds or fraction thereof, and one observation room providing direct observation of every portion of the room for every 15 mental health beds or fraction thereof. At least one safety room and one observation room shall be provided.

**1227.23.3 Safety rooms.** Safety rooms shall be constructed so as to provide video camera observation capability. Safety rooms shall comply with the design criteria requirements of Section 1231.2.5 for a safety cell.

**SECTION 1228**  
**Reserved****SECTION 1229**  
**Reserved****SECTION 1230 [BSCC]**  
**MINIMUM STANDARDS FOR JUVENILE FACILITIES**  
**1230.1 Design criteria for required spaces.**

**1230.1.1 Reception/intake admission.** In each juvenile hall, space used for the reception of minors pending admission to juvenile hall shall have the following space and equipment:

1. Weapons lockers as specified in Section 1230.2.9;
2. A secure room for the confinement of minors pending admission to juvenile hall as specified in Section 1230.1.2;

In each juvenile hall, camp and ranch, space used for the reception of minors pending admission to these facilities shall have the following space and equipment:

3. Access to a shower;
4. A secure vault or storage space for minors, valuables;

5. Telephones accessible to minors; and
6. Access to hot and cold running water for staff use.

**1230.1.2 Locked holding room.** A locked holding room shall:

1. Contain a minimum of 15 square feet ( $1.4 \text{ m}^2$ ) of floor area per youth;
2. Provide no less than 45 square feet ( $4.2 \text{ m}^2$ ) of floor space and have a clear ceiling height of 8 feet (2438 mm) or more;
3. Contain seating to accommodate all youth as specified in Section 1230.2.8;
4. Be equipped with a toilet, wash basin and drinking fountain as specified in Section 1230.2, unless a procedure is in effect to give the youth access to a toilet, wash basin and drinking fountain;
5. Maximize visual supervision of youth by staff; and
6. Have an outward swinging or lateral sliding door.

**1230.1.3 Natural light.** Visual access to natural light shall be provided in locked sleeping rooms, single occupancy sleeping rooms, double occupancy sleeping rooms, dormitories and day rooms. Natural light may be provided by, but is not limited to, skylights or windows in dayrooms, windows in adjacent exterior exercise areas, and in sleeping rooms and/or dormitories.

**1230.1.4 Corridors.** Corridors in living units shall be at least 8 feet (2438 mm) wide.

**Exception:** Where room doors are staggered, or if rooms are located on only one side, corridors shall be at least 6 feet (1829 mm) wide.

**1230.1.5 Living unit.** A living unit shall be a self-contained unit containing locked sleeping rooms, single and double occupancy sleeping rooms, or dormitories, dayroom space, toilet, wash basins, drinking fountains and showers commensurate to the number of youth housed. A living unit shall not be divided in a way that hinders direct access, supervision, immediate intervention or other action if needed. In juvenile halls, the number of youth housed in a living unit shall not exceed 30.

**1230.1.6 Locked sleeping rooms.** Locked sleeping rooms shall be equipped with an individual or combination toilet, wash basin and drinking fountain. Doors to locked sleeping rooms shall swing outward or slide laterally.

**1230.1.7 Single occupancy sleeping rooms.** Single occupancy sleeping rooms shall provide the following:

1. A minimum of 70 square feet ( $1.78 \text{ m}^2$ ) of floor area;
2. A minimum clear ceiling height of 8 feet (2438 mm); and,
3. The door into this room shall swing outward or slide laterally and be provided with a view panel, a minimum of 144 square inches ( $92,903 \text{ mm}^2$ ), constructed of security glazing.

**1230.1.8 Double occupancy sleeping rooms.** Double occupancy sleeping rooms shall provide the following:

1. A minimum of 100 square feet ( $9.3 \text{ m}^2$ ) of floor area;
2. A minimum clear ceiling height of 8 feet (2438 mm) and a minimum width of 7 feet (2134 mm); and,
3. The door into this room shall swing outward or slide laterally and be provided with a view panel, a minimum of 144 square inches ( $92,903 \text{ mm}^2$ ), constructed of security glazing.

**1230.1.9 Dormitories.** Dormitories shall provide the following:

1. A minimum of 50 square feet ( $4.6 \text{ m}^2$ ) of floor area per minor with the minimum size of a dormitory being 200 square feet ( $18.6 \text{ m}^2$ ) of floor area and a minimum 8-foot (2438 mm) clear ceiling height;
2. Designed for no fewer than four minors;
3. Dormitories in juvenile halls shall be designed for no more than 30 minors;
4. Camps shall conform to Items 1 and 2.

**1230.1.10 Dayrooms.** Dayrooms shall contain 35 square feet ( $3.3 \text{ m}^2$ ) of floor area per minor. Access must be provided to toilets, wash basins, drinking fountains and showers as specified in Section 1230.2.

**1230.1.11 Physical activity and recreation areas.** Indoor/outdoor physical activity and recreation areas shall be designed as follows:

<b>1. Facility capacity</b>	<b>Minimum indoor outdoor recreation space</b>
40 or less	9,000 square feet ( $836 \text{ m}^2$ )
41 to 274	225 square feet ( $21 \text{ m}^2$ ) per minor up to 61,650 square feet ( $5727 \text{ m}^2$ )
275 or more	61,650 square feet ( $5727 \text{ m}^2$ ), plus 145 square feet ( $13.47 \text{ m}^2$ ) for each minor beyond 274 [up to a maximum of 87,120 square feet ( $8093 \text{ m}^2$ )]

- 1.1. At least one quarter of the dedicated indoor/outdoor space shall be a paved or like surface.
- 1.2. The required recreation area shall contain no single dimension less than 40 feet (12.2 m).
2. A portion of the dedicated space for physical activity and recreation shall be out-of-doors and be of sufficient size and equipped in such a manner to allow compliance with Title 15, Section 1371, which requires at least one hour per day of outdoor activity for each detained minor.
3. Lighting of outdoor recreation areas shall be provided to allow for evening activities and to provide security.
4. Access must be provided to a toilet, wash basin and drinking fountain as specified in Section 1230.2.

**TABLE 1230A**  
**REQUIRED SPACES AND EQUIPMENT IN JUVENILE FACILITIES**

SECTION NUMBERS	REGULATION	HALLS	CAMPS	SPJH
1230.1.1	<i>Reception/intake admission</i>	X		
1230.1.2	<i>Locked holding rooms</i>	X	X <sup>1</sup>	
1230.1.3	<i>Natural light</i>	X	X	X
1230.1.4	<i>Corridors</i>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>
1230.1.5	<i>Living units</i>	X		
1230.1.6	<i>Locked sleeping rooms</i>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>
1230.1.7	<i>Single occupancy sleeping rooms</i>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>
1230.1.8	<i>Double occupancy sleeping rooms</i>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>
1230.1.9	<i>Dormitories</i>	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>
1230.1.10	<i>Day rooms</i>	X	X	X
1230.1.11	<i>Physical activity and recreation areas</i>	X	X	
1230.1.12	<i>Academic classrooms</i>	X	X	
1230.1.13	<i>Safety rooms</i>	X <sup>1</sup>		
1230.1.14	<i>Medical examination rooms</i>	X	X	
1230.1.15	<i>Pharmaceutical storage</i>	X	X	X
1230.1.16	<i>Dining areas</i>	X	X	
1230.1.17	<i>Visiting space</i>	X	X	X
1230.1.18	<i>Institutional storage</i>	X	X	X
1230.1.19	<i>Personal storage</i>	X	X	X
1230.1.20	<i>Safety equipment storage</i>	X	X	X
1230.1.21	<i>Janitorial closet</i>	X	X	X
1230.1.22	<i>Audio monitoring system</i>	X	X	X
1230.1.23	<i>Emergency power</i>	X	X	X
1230.1.24	<i>Confidential interview rooms</i>	X	X	X
1230.1.25	<i>Special-purpose juvenile halls</i>	X		
1230.1.26	<i>Court holding rooms for minors*</i>	X <sup>1</sup>		
1230.2.1	<i>Toilets/urinals</i>	X	X	X
1230.2.2	<i>Wash basins</i>	X	X	X
1230.2.3	<i>Drinking fountains</i>	X	X	X
1230.2.4	<i>Showers</i>	X	X	X
1230.2.5	<i>Beds</i>	X	X	X
1230.2.6	<i>Lighting</i>	X	X	X
1230.2.7	<i>Padding</i>	X <sup>1</sup>		
1230.2.8	<i>Seating</i>	X	X	X
1230.2.9	<i>Weapons lockers</i>	X	X <sup>1</sup>	X

*Key:*

*Halls* = Juvenile halls.

*Camps* = Camps, ranches, forestry camps or boot camps.

*SPJH* = Special purpose juvenile halls.

\* = For minors in jail, minors in temporary custody in a law enforcement facility and minors in court holding facilities, see Sections 1520, 1540 and 1560 of Title 15, respectively.

X = Regulation is applicable for all juvenile facilities.

X<sup>1</sup> = Regulation is applicable for halls, camps and special purpose juvenile halls dependent on operational characteristics of the facility.

**1230.1.12 Academic classrooms.** There shall be dedicated classroom space for every juvenile in every facility. The primary purpose for the academic classroom shall be for education. Each academic classroom shall contain a minimum of 160 square feet ( $14.9 \text{ m}^2$ ) of floor space for the teachers' desk and work area and a minimum of 28 square feet ( $2.6 \text{ m}^2$ ) of floor space per minor. A communication system shall be provided in each classroom to allow for immediate response to emergencies. The classroom shall be designed for a maximum of 20 minors.

**1230.1.13 Safety room.** A safety room shall:

1. Contain a minimum of 63 square feet ( $5.9 \text{ m}^2$ ) of floor area and a minimum clear ceiling height of 8 feet (2438 mm);
2. Be limited to one minor;
3. Be padded as specified in Section 1230.2.7;
4. Provide one or more vertical view panels constructed of security glazing. These view panels shall be no more than 4 inches (102 mm) wide nor less

- than 24 inches (610 mm) long, which shall provide a view of the entire room;
5. Provide an audio monitoring system as specified in Section 1230.1.22;
  6. Provide access to a toilet, wash basin and drinking fountain outside the room as specified in Section 1230.2; and
  7. Be equipped with a variable intensity, security-type lighting fixture with controls located outside the room.
  8. Any wall or ceiling-mounted devices must be designed to prohibit access to the minor occupant.

**1230.1.14 Medical examination room.** There must be a minimum of one suitably equipped medical examination room in every juvenile facility. Medical examination rooms shall provide the following:

1. Space for carrying out routine medical examinations and emergency care and used for no other purpose;
2. Privacy for minors;
3. Lockable storage space for medical supplies;
4. Not less than 144 square feet ( $13.4 \text{ m}^2$ ) of floor space with no single dimension less than 7 feet (2134 mm);
5. Hot and cold running water; and
6. Smooth, nonporous, washable surfaces.

**1230.1.15 Pharmaceutical storage.** Provide lockable storage space for medical supplies and pharmaceutical preparations as specified by Title 15, Section 1438.

**1230.1.16 Dining areas.** Dining areas in juvenile facilities shall contain a minimum of 15 square feet ( $1.4 \text{ m}^2$ ) of floor space and sufficient tables and seating for each person being fed. Persons being fed include minors, staff and visitors. Dining areas shall not contain toilets or showers in the same room without appropriate visual barrier.

**1230.1.17 Visiting space.** Space shall be provided in all juvenile facilities for visiting.

**1230.1.18 Institutional storage.** One or more storage rooms shall be provided to accommodate a minimum of 80 cubic feet ( $2.3 \text{ m}^3$ ) of storage space per minor. Items to be stored shall be institutional clothing, bedding, supplies and activity equipment.

**1230.1.19 Personal storage.** Each minor in a juvenile facility shall be provided with a minimum of 9 cubic feet ( $0.25 \text{ m}^3$ ) of secure storage space for personal clothing and belongings.

**1230.1.20 Safety equipment storage.** In all juvenile facilities, a secure area shall be provided for the storage of safety equipment, such as fire extinguishers, self-contained breathing apparatus, wire and bar cutters, emergency lights, etc.

**1230.1.21 Janitorial closet.** In all juvenile facilities, at least one securely lockable janitorial closet, containing a mop sink and sufficient area for the storage of cleaning

implements, must be provided within the security area of the facility.

**1230.1.22 Audio monitoring system.** In safety rooms, locked holding rooms, locked sleeping rooms, single and double occupancy rooms and dormitories, there must be an audio monitoring system capable of actuation by the minor that alerts personnel.

**1230.1.23 Emergency power.** There shall be a source of emergency power in all juvenile facilities capable of providing minimal lighting in all living units, activities areas, corridors, stairs and central control points, and to maintain fire and life safety, security, communications and alarm systems (Title 24, Part 2, Chapter 27). Such an emergency power source shall conform to the requirements specified in Title 24, Part 3, Article 700, California Electrical Code, California Code of Regulations.

**1230.1.24 Confidential interview room.** Confidential interview rooms shall contain a minimum of 60 square feet ( $5.6 \text{ m}^2$ ) of floor area. In juvenile halls there shall be a minimum of one suitably furnished interview room for each 30 minors. In camps there shall be a minimum of one suitably furnished interview room for each facility. This interview room shall provide for confidential consultations with minors.

**1230.1.25 Special-purpose juvenile halls.** Special-purpose juvenile halls shall conform to all minimum standards for juvenile facilities contained in this section with the following exceptions:

1. Physical activity and recreation areas as specified in Section 1230.1.11;
2. Academic classrooms as specified in Section 1230.1.12;
3. Medical examination room as specified in Section 1230.1.14; and,
4. Dining areas as specified in Section 1230.1.16.

**1230.1.26 Court holding room for minors.** A court holding room shall:

1. Contain a minimum of 10 square feet ( $0.93 \text{ m}^2$ ) of floor area per minor;
2. Be limited to no more than 16 minors;
3. Provide no less than 40 square feet ( $3.7 \text{ m}^2$ ) of floor area and have clear ceiling height of 8 feet (2438 mm) or more;
4. Contain seating to accommodate all minors as specified in Section 1230.2.8;
5. Contain a toilet, wash basin and drinking fountain as specified in Section 1230.2; and,
6. Maximize visual supervision of minors by staff.

**1230.1.27 Program and activity areas.** Camp and ranch facilities shall include adequate space for specific programs in addition to recreation and exercise areas.

**1230.2 Design criteria for furnishings and equipment.**

**1230.2.1 Toilet/urinals.** In living units, toilets must be available in a ratio to minors as follows:

1. Juvenile halls 1:6;
2. Camps 1:10; and
3. Locked holding rooms 1:8;

*One toilet and one urinal may be substituted for every 15 males.*

**Note:** Toilet areas shall provide privacy for the minor without mitigating staff's ability to supervise.

**1230.2.2 Wash basins.** In living units, wash basins must be available in a ratio to minors as follows:

1. Juvenile halls 1:6;
2. Camps 1:10; and
3. Locked holding rooms 1:8;

*Wash basins must be provided with hot and cold or tempered water.*

**1230.2.3 Drinking fountains.** In living areas and indoor and outdoor recreation areas, drinking fountains must be accessible to minors and to staff.

1. The drinking fountain bubbler shall be on an angle which prevents waste water from flowing over the drinking bubbler; and,
2. The water flow shall be actuated by a mechanical means.

**1230.2.4 Showers.** In living units, showers shall be available to all minors on a ratio of at least one shower or bathtub to every six minors. Showers shall be provided with tempered water.

**Note:** Shower areas shall provide privacy for the minor without mitigating staff's ability to supervise.

**1230.2.5 Beds.** Beds shall be at least 30 inches (762 mm) wide and 76 inches (1930 mm) long and be of the solid bottom type or constructed of concrete. Beds shall be at least 12 inches (305 mm) off the floor and spaced no less than 36 inches (914 mm) apart. Bunk beds must have no less than 33 inches vertically between the solid bottoms. In secure facilities, the bunks shall be securely anchored and flushed against the floor and/or wall.

**1230.2.6 Lighting.** Lighting in locked sleeping rooms, single occupancy rooms, double occupancy rooms, dormitories, day rooms and activity areas shall provide not less than 20 footcandles (216 lux) of illumination at desk level. Night lighting is required in these areas to provide good visibility for supervision and be conducive to sleep.

**1230.2.7 Padding.** In safety rooms, padding shall cover the entire floor, door, walls and everything on the walls to a clear height of 8 feet (2438 mm). Benches or platforms are not to be placed on the floor of this room.

All padded rooms must be equipped with a tamper-resistant fire sprinkler as approved by the State Fire Marshal. All padding must be:

1. Approved for use by the State Fire Marshal;

2. Nonporous to facilitate cleaning;
3. At least  $\frac{1}{2}$  inch (12.7 mm) thick;
4. Of a unitary or laminated construction to prevent its destruction by teeth, hand tearing or small metal objects;
5. Firmly bonded to all padded surfaces to prevent tearing or ripping; and,
6. Without any exposed seams susceptible to tearing or ripping.

**1230.2.8 Seating.** Seating shall be designed to the level of security. When bench seating is used, 18 inches (457 mm) of bench is seating for one person.

**1230.2.9 Weapons lockers.** Weapons lockers are required in all secure juvenile facilities and shall be located outside the secure area of the facility. Weapons lockers shall be equipped with individual compartments, each with an individual locking device.

**1230.2.10 Security glazing.** Security glazing shall comply with the minimum requirements of one of the following test standards: American Society for Testing and Materials, ASTM F 1233-98, Class III glass, or; California Department of Corrections, CDC 860-94d, Class C glass or; H.P. White Laboratory, Inc., HPW-TP-0500.02, Forced Entry Level III.

## SECTION 1231 [BSCC] LOCAL DETENTION

### 1231.1 Definitions.

**BOARD OF STATE & COMMUNITY CORRECTIONS** means the Board of State & Community Corrections, which acts by and through its executive officer, deputy directors and field representatives.

**LIVING AREAS** means those areas of a facility utilized for the day-to-day housing and activities of inmates. These areas do not include special-use cells such as sobering, safety and holding or staging cells normally located in receiving areas.

**LOCAL DETENTION FACILITY** is any city, county, city and county, or regional jail, camp, court holding facility or other correctional facility, whether publicly or privately operated, and court holding facility used for the confinement of adults or of both adults and minors, but does not include that portion of a facility for the confinement of both adults and minors which is devoted only to the confinement of minors. The types of local detention facilities are as follows:

**Court holding facility** means a local detention facility constructed within a court building after January 1, 1978, used for the confinement of persons solely for the purpose of a court appearance for a period not to exceed 12 hours.

**Temporary holding facility** means a local detention facility constructed after January 1, 1978, used for the confinement of persons for 24 hours or less pending release, transfer to another facility or appearance in court.

**Type I facility** means a local detention facility used for the detention of persons usually pending arraignment for not more than 96 hours, excluding holidays, after booking. Such a Type I facility may also detain persons on court order either for their own safe-keeping or sentenced to a city jail as an inmate worker, and may house inmate workers sentenced to the county jail provided such placement in the facility is made on a voluntary basis on the part of the inmate. As used in this section, an inmate worker is defined as a person assigned to perform designated tasks outside of his or her cell or dormitory, pursuant to the written policy of the facility, for a minimum of four hours each day on a five-day scheduled work week.

**TYPE II FACILITY** means a local detention facility used for the detention of persons pending arraignment, after arraignment, during trial and upon a sentence of commitment.

**TYPE III FACILITY** means a local detention facility used only for the detention of convicted and sentenced persons.

**TYPE IV FACILITY** means a local detention facility or portion thereof designated for the housing of inmates eligible, under Penal Code Section 1208, for work/education furlough and/or other programs involving inmate access into the community.

**RATED CAPACITY** means the number of inmate occupants for which a facility's single-and double-occupancy cells or dormitories, except those dedicated for medical or disciplinary isolation housing, were planned and designed in conformity to the standards and requirements contained herein and in Title 15, C.C.R.

### 1231.2 Design criteria for required spaces.

**1231.2.1 Reception and booking.** Facilities where booking and housing occur shall have the following space and equipment:

1. Weapons locker as specified in Section 1231.3.12.
2. A cell or room for the confinement of inmates pending their booking, complying with Section 1231.2.2.
3. A sobering cell as described in Section 1231.2.4 if intoxicated, inmates who may pose a danger to themselves or others are held. For those facilities that accept male and female intoxicated inmates two sobering cells shall be provided.
4. Access to a shower within the secure portion of the facility.
5. Provide access to a secure vault or storage space for inmate valuables.
6. A safety cell or cells as described in Section 1231.2.5 if the program statement identifies the need for such a cell.
7. Telephones which are accessible to the inmates.
8. Unobstructed access to hot and cold running water for staff use.

**1231.2.2 Temporary holding cell or room.** A temporary holding cell or room shall:

1. Contain a minimum of 10 square feet ( $0.93\text{ m}^2$ ) of floor area per inmate;
2. Be limited to no more than 16 inmates;
3. Be no smaller than 40 square feet ( $3.7\text{ m}^2$ ) and have a clear ceiling height of 8 feet (2438 mm) or more;
4. Contain seating to accommodate all inmates as required in Section 1231.3;
5. Contain a toilet, wash basin and drinking fountain as specified in Section 1231.3;
6. Maximize visual supervision of inmates by staff; and
7. When located in a temporary holding facility, the cell or room shall be equipped with a bunk if inmates are to be held longer than 12 hours.

**1231.2.3 Temporary staging cell or room.** A temporary staging cell or room shall:

1. Be constructed for the purpose of holding inmates who have been classified and segregated in accordance with Sections 1050 and 1053 of Title 15, Division 1, California Code of Regulations.
2. Be limited to holding inmates up to four hours.
3. Be limited to no more than 80 inmates.
4. Contain a minimum of 10 square feet ( $0.93\text{ m}^2$ ) of floor area per inmate and a clear ceiling height of 8 feet (2438 mm) or more.
5. Be no smaller than 160 square feet ( $14.9\text{ m}^2$ ).
6. Contain seating to accommodate all inmates as required in Section 1231.3.
7. Contain toilet, wash basin and drinking fountain as specified in Section 1231.3.
8. Maximize visual supervision of inmates by staff.

**1231.2.4 Sobering cell.** A sobering cell shall:

1. Contain a minimum of 20 square feet ( $1.9\text{ m}^2$ ) of floor area per inmate;
2. Be limited to eight inmates;
3. Be no smaller than 60 square feet ( $5.6\text{ m}^2$ ) and have a clear ceiling height of 8 feet (2438 mm) or more;
4. Contain a toilet, wash basin and drinking fountain as specified in Section 1231.3;
5. Have padded partitions located next to toilet fixture in such a manner that they provide support to the user;
6. Maximize visual supervision of inmates by staff;
7. Be padded on the floor as specified in Section 1231.3; and,
8. Have accessible a shower in the secure portion of the facility.

**TABLE 1231A  
REQUIRED SPACES AND EQUIPMENT IN JUVENILE FACILITIES**

	<b>TYPE I</b>	<b>TYPE II</b>	<b>TYPE III</b>	<b>TYPE IV</b>	<b>COURT HOLDING</b>	<b>TEMPORARY HOLDING</b>
<i>Reception/booking</i>	x	x	*	*		*
<i>Temporary holding cells or room</i>	x	x	*	*	x	x
<i>Detoxification cell</i>	*	x				
<i>Safety cell</i>	*	*				
<i>Single-occupancy cell</i>	x	x	*			
<i>Dormitories</i>	*	x	x	x		
<i>Day room</i>	*	x	x			
<i>Exercise area</i>		x	x	x <sup>1</sup>		
<i>Shower area/delousing room</i>	x	x				*
<i>Program/multipurpose space</i>		x	x	x		
<i>Medical exam room<sup>2</sup></i>		x	x			
<i>Pharmaceutical storage space</i>	x	x	x	x		*
<i>Medical care housing</i>		*	*			
<i>Hair care space</i>		x	x			
<i>Commissary<sup>3</sup></i>			x	x <sup>3</sup>		
<i>Dining facility<sup>4</sup></i>	*	x	x	*		
<i>Visiting space</i>	x	x	x	x		
<i>Attorney interview rooms</i>	x	x	x		x	x
<i>Confidential interview rooms</i>		x	*			
<i>Safety equipment storage</i>	x	x <sup>2</sup>	x	x	x	x
<i>Janitor closet</i>	x	x	x	x	x	x
<i>Storage rooms</i>	x	x <sup>5</sup>	x	x	x	x
<i>Audio/video-monitoring systems</i>	x	x	x <sup>6</sup>	*	x	x
<i>Laundry facility</i>		x		x <sup>7</sup>		
<i>Fire-detection alarm system</i>	x	x	x	x	x	x
<i>Emergency</i>	x	x	x	x	x	x

x Required.

\* Required when program statement identifies need.

1. Not required if community recreation facilities are available.
2. Not required if the inmate population is less than 25.
3. Not required if community access is available.
4. Not required if meals are served in day room.
5. Must be securely lockable and located within the security area.
6. Required in areas housing prisoners of higher than minimum security.
7. Not required if community access is permitted.

#### **1231.2.5 Safety cell.** A safety cell shall:

1. Contain a minimum of 48 square feet ( $4.5 \text{ m}^2$ ) of floor area with no one floor dimension being less than 6 feet (1829 mm) and a clear ceiling height of 8 feet (2438 mm) or more;
2. Be limited to one inmate;
3. Contain a flushing ring toilet, capable of accepting solid waste, mounted flush with the floor, the controls for which must be located outside of the cell;
4. Be padded as specified in Section 1231.3;
5. Be equipped with a variable intensity, security-type lighting fixture which is inaccessible to the inmate

occupant, control of which is located outside of the cell;

6. Provide one or more vertical view panels not more than 4 inches (102 mm) wide nor less than 24 inches (610 mm) long which shall provide a view of the entire room;
7. Provide a food pass with lockable shutter, no more than 4 inches (102 mm) high, and located between 26 inches (660 mm) and 32 inches (813 mm) as measured from the bottom of the food pass to the floor; and,
8. Any wall or ceiling mounted devices must be inaccessible to the inmate occupant.

**1231.2.6 Single-occupancy cells.** Single-occupancy cells shall:

1. Have a maximum capacity of one inmate;
2. Contain a minimum of 60 square feet ( $5.6 \text{ m}^2$ ) of floor area in Type I facilities and 70 square feet ( $6.5 \text{ m}^2$ ) of floor area in Type II and Type III facilities;
3. Have a minimum clear ceiling height of 8 feet (2438 mm) and a minimum width of 6 feet (1829 mm);
4. Contain a toilet, wash basin and drinking fountain as specified in Section 1231.3; and
5. Contain a bunk, desk and seat as specified in Section 1231.3.

**Exception:** A Type I facility does not require a desk and seat.

**1231.2.7 Double-occupancy cells.** Double-occupancy cells shall:

1. Have a maximum capacity of two inmates;
2. Contain a minimum of 60 square feet ( $5.6 \text{ m}^2$ ) of floor area in Type I facilities and 70 square feet ( $6.5 \text{ m}^2$ ) of floor area in Type II and Type III facilities;
3. Have a minimum clear ceiling height of 8 feet (2438 mm) and a minimum width of 6 feet (1829 mm);
4. Contain a toilet, wash basin and drinking fountain as specified in Section 1231.3; and
5. Contain two bunks, and at least one desk and seat as specified in Section 1231.3.

**Exception:** A Type I facility does not require a desk and seat.

**1231.2.8 Dormitories.** Dormitories shall:

1. Contain a minimum of 50 square feet ( $4.7 \text{ m}^2$ ) of floor area per inmate for a single-bed unit; a minimum of 70 square feet ( $7 \text{ m}^2$ ) for a double-bed unit; and a minimum of 90 square feet ( $9.3 \text{ m}^2$ ) for triple-bed unit and have a minimum ceiling height of 8 feet (2438 mm);
2. Be designed for no more than 64 inmates and no fewer than four inmates;
3. Provide access to water closets separate from the wash basin and drinking fountains as specified in Section 1231.3; and
4. In other than Type I facilities, provide storage space for personal items and clothing for each occupant.

**1231.2.9 Dayrooms.**

Dayrooms or dayroom space shall:

1. Contain 35 square feet ( $3.3 \text{ m}^2$ ) of floor area per inmate in width in front of cells/rooms;
2. Contain tables and seating to accommodate the maximum number of inmates;
3. Provide access to water closets, wash basins and drinking fountains as specified in Section 1231.3;
4. Provide access to a shower or showers as specified in Section 1231.3; and

5. Be provided to all inmates in Type II and Type III facilities (except those housed in special-use cells) and to inmate workers in Type I facilities.

Dayroom space as described in this section may be a part of a single occupancy cell used for administrative segregation or a dormitory, in which case the floor area of the cell or a dormitory must be increased by the square footage required for the dayroom.

**1231.2.10 Exercise area.** An outdoor exercise area or areas must be provided in every Type II and Type III facility. The minimum clear height must be 15 feet (4572 mm) and the minimum number of square feet of surface area will be computed by multiplying 80 percent of maximum rated population by 50 square feet ( $4.7 \text{ m}^2$ ) and dividing the result by the number of one-hour exercise periods per day.

The exercise area must contain or provide free access to a toilet, wash basin, and drinking fountain as provided in Section 1231.3.

There must be at least one exercise area of not less than 600 square feet ( $55.7 \text{ m}^2$ ). The design shall facilitate security and supervision appropriate to the level of custody.

Type IV facilities shall have an outdoor recreation area or access to community recreation facilities.

**1231.2.11 Correctional program/multipurpose space.** An area for correctional programming must be provided in every Type II and Type III facility. The program area and furnishings shall be designed to meet the needs specified by the facility's program statement.

Type IV facilities shall have multipurpose space for games and activities, dining, visiting, TV meetings and quiet space for study and reading, such that activities do not conflict with each other.

**1231.2.12 Medical examination room.** There must be a minimum of one suitably equipped medical examination room in every facility which provides on-site health care. The examination room shall be designed in consultation with the responsible physician/health authority. Such a medical examination room shall:

1. Be located within the security area and provide for privacy of the inmates;
2. Provide not less than 100 square feet ( $9.3 \text{ m}^2$ ) of floor space with no single dimension less than 7 feet (2134 mm);
3. Provide hot and cold running water;
4. Provide lockable storage for medical supplies; and
5. Any room where medical procedures are provided must be equipped with hot and cold running water.

**1231.2.13 Pharmaceutical storage space.** Provide lockable storage space for medical supplies and pharmaceutical preparations as referenced by Title 15, California Code of Regulations, Section 1216.

**1231.2.14 Medical care housing.** There shall be some means to provide medical care and housing of ill and/or infirm inmates. When the program statement for a Type II

or Type III facility indicates that medical care housing is needed, such housing must provide lockable storage space for medical instruments and must be located within the security area of the facility accessible to both female and male inmates, but not in the living area of either. The medical care housing unit shall be designed in consultation with the health authority. Medical/mental health areas may contain other than single occupancy cells.

If negative pressure isolation rooms are being planned, they shall be designed to recognized industry standards.

#### **1231.2.15 Reserved.**

**1231.2.16 Commissary.** In all Type II, III and IV facilities, except where community access is available, there shall be provisions made for inmates to purchase items (such as candy, toilet articles, stationery supplies, books, newspapers and magazines, etc.). An area shall be provided for the secure storage of the stock for such inmate canteen items.

**1231.2.17 Dining facilities.** In all Type II, III and IV facilities which serve meals, dining areas shall be provided which will allow groups of inmates to dine together. Such dining areas shall not contain toilets, wash basins or showers in the same room without appropriate visual barrier. Wherever the facility contains a central dining room or rooms, it shall contain a minimum of 15 square feet (1.4 m<sup>2</sup>) of floor space and sufficient tables and seating for each inmate being fed.

**1231.2.18 Visiting space.** Space shall be provided in all Types I, II, III and IV facilities for visiting.

**1231.2.19 Safety equipment storage.** A secure area shall be provided for the storage of safety equipment such as fire extinguishers, self-contained breathing apparatus, wire and barcutters, emergency lights, etc.

**1231.2.20 Janitors' closet.** In Type II facilities, at least one securely lockable janitors' closet with sufficient area for the storage of cleaning implements and supplies must be provided within the security areas of the facility. A mop sink shall also be available within the security area of the facility. In court holding, temporary holding, Types I, III and IV facilities, the closet need not be in the security area.

**1231.2.21 Storage rooms.** One or more storage rooms shall be provided to accommodate a minimum of 80 cubic feet (2.3 m<sup>3</sup>) of storage area per inmate for inmate clothing and personal property, institutional clothing, bedding and supplies. Court holding, temporary holding and Type I facilities may be excluded from the storage space requirement for personal and institutional clothing unless clothing is issued.

**1231.2.22 Audio monitoring system.** In court holding, temporary holding, Type I, Type II and Type III facilities there shall be an inmate- or sound-actuated audio monitoring system in temporary holding cells or rooms, temporary staging cells or rooms, sobering cells, safety cells, single and double occupancy cells, dormitories, day-rooms, exercise areas and correctional program/multipur-

pose space, which is capable of alerting personnel who can respond immediately.

**1231.2.23 Laundry facilities.** In Type IV facilities, provision shall be made for washing and drying personal clothing by machines, either in the facility or in the community, if access is permitted for same.

**1231.2.24 Emergency power.** There shall be a source of emergency power in all detention facilities capable of providing minimal lighting in all housing units, activities areas, corridors, stairs and central control points, and to maintain fire and life safety, security, communications and alarm systems. Such an emergency power source shall conform to the requirements specified in Title 24, Part 3, Article 700, California Electrical Code, California Code of Regulations.

**1231.2.25 Confidential interview rooms.** There must be a minimum of one suitably furnished interview room for confidential interviews in every facility which provides on-site health care. The interview room shall be designed in consultation with responsible custodial staff and health care staff. Such an interview room shall:

1. Be located within the security area accessible to both female and male inmates; and
2. Provide not less than 70 square feet (6.5 m<sup>2</sup>) of floor space with no single dimension less than 6 feet (1829 mm).

**1231.2.26 Attorney interview space.** All facilities except Type IV facilities shall include attorney interview areas which provide for confidential consultation with inmates.

**Exception:** The design of court holding and temporary holding facilities shall include the following required spaces from Sections 1231.2.2, 1231.2.19, 1231.2.20, 1231.2.21, 1231.2.22, 1231.2.24 and 1231.2.26.

**1231.3 Design criteria for furnishings and equipment.** Furnishings and equipment shall be as follows:

#### **1231.3.1 Toilets/urinals.**

1. Toilets/urinals must be provided in single-occupancy cells and double-occupancy cells.
2. In dormitories, toilets/urinals must be provided in a ratio to inmates of 1:10.
3. Toilets/urinals must be accessible to the occupants of day-rooms and exercise areas.
4. In temporary holding cells and temporary staging cells toilets/urinals must be provided in a ratio to inmates of 1:16.
5. In sobering cells toilets/urinals must be provided in a ratio to inmates of 1:8.
6. One urinal or 2 feet (610 mm) of urinal trough may be substituted for each toilet up to one third of the total number of toilets required, except in those facilities or portions thereof used for females.

**Note:** Toilet areas shall provide modesty for inmates with staff being able to visually supervise.

**1231.3.2 Wash basins.**

1. Wash basins must be provided in single occupancy cells and double occupancy cells.
2. In dormitories, wash basins must be provided in a ratio to inmates of 1:10.
3. Wash basins must be accessible to the occupants of day-rooms and exercise areas.
4. In temporary holding cells and temporary staging cells, wash basins must be provided in a ratio to inmates of 1:16.
5. In sobering cells, wash basins must be provided in a ratio to inmates of 1:8.
6. Wash basins must be provided with hot and cold or tempered water.
7. Two feet (610 mm) of wash basin trough may be substituted for each basin required.

**1231.3.3 Drinking fountains.** There must be a minimum of one drinking fountain in every single-occupancy cell, double-occupancy cell, dormitory, temporary holding cell, temporary staging cell, sobering cell, and be accessible to the occupants of day rooms and exercise areas. Additional drinking fountains shall be located in other areas of the facility so that drinking water will be available to inmates and staff. Such drinking fountains must meet the following minimum health requirements:

1. The drinking fountain bubbler shall be on an angle which prevents waste water from flowing over the drinking fountain bubbler.
2. Water flow shall be actuated by mechanical means.

**1231.3.4 Showers** must be available to all inmates on a ratio of at least one shower to every 20 inmates or fraction thereof and must provide hot and cold water or tempered water. Shower stalls/shower areas must be designed and constructed of materials which are impervious to water and soap so they may be easily cleaned.

**Note.** Shower areas shall provide modesty for inmates with staff being able to visually supervise.

**1231.3.5 Beds** must be elevated off the floor, have a solid bottom, and a sleeping surface of at least 30 inches (762 mm) wide and 76 inches (1930 mm) long. Multiple beds must have a minimum of 21 inches (533 mm) between bed pans. Except in minimum security areas, beds must be securely fastened to the floor or the wall.

**1231.3.6 Lighting.** Lighting in housing units, dayrooms and activity areas must be sufficient to permit easy reading by a person with normal vision, and shall not be less than 20 footcandles (215.2 lux) at desk level and in the grooming area. Lighting shall be centrally controlled and/or occupant controlled in housing cells or rooms. Night lighting in these areas shall be sufficient to give good visibility for purposes of supervision. In minimum-security areas, lighting may be supplied by ordinary lighting fixtures, and in areas of higher security, light fixtures must be of secure design.

**1231.3.7 Windows.** In housing areas of higher than minimum security, exterior windows which are constantly accessible to inmates for escape must be designed and constructed so that if broken out, the net area accessible for escape is no greater than 5 inches (127 mm) in one dimension.

**1231.3.8 Cell padding.** In sobering cells, the floor and partition shall be padded. In safety cells, padding must cover the entire floor, doors, and walls and everything on them to a clear height of 8 feet (2438 mm).

All such padded cells must be equipped with a tamper-resistant fire sprinkler as approved by the State Fire Marshal. All padding must be:

1. Approved for use by the State Fire Marshal;
2. Nonporous to facilitate cleaning;
3. At least  $\frac{1}{2}$ -inch (12.7 mm) thick;
4. Of a unitary or laminated construction to prevent its destruction by teeth, hand tearing or small metal objects;
5. Firmly bonded to all padded surfaces to prevent tearing or ripping; and
6. Without any exposed seams susceptible to tearing or ripping.

**1231.3.9 Mirrors.** A mirror of a material appropriate to the level of security must be provided near each wash basin specified in these regulations.

**1231.3.10 Seating.** In temporary holding and temporary staging cells, seating must be securely fixed to the floor and/or wall. When bench seating is used, 18 inches (457 mm) of bench is seating for one person.

**1231.3.11 Table/seat.** In single- and double-occupancy cells, a table and seat for the purpose of writing and dining shall be provided.

**Exception:** A Type I facility does not require a table and a seat.

**1231.3.12 Weapons locker.** A secure weapons locker shall be located outside the security perimeter of the facility. Such weapons lockers shall be equipped with individual compartments, each with an individual locking device. Weapons lockers are required in temporary and court holding facilities and in all facilities of higher than minimum security.

**Exception:** The design of court holding and temporary holding facilities shall include the design criteria for furnishings and equipment from Sections 1231.3.1, 1231.3.2, 1231.3.3, 1231.3.6, 1231.3.10 and 1231.3.12.

**1231.4 Enclosure of vertical openings.** Elevator shafts, vent shafts and other vertical openings shall be enclosed, and the enclosure shall be as set forth in Chapter 7.

**1231.5 Fire-extinguishing systems.** Automatic fire-extinguishing systems, standpipes and basement pipe inlets shall be installed when and as required by Chapter 9.

**1231.6 Existing Group I occupancies.** Existing buildings housing existing protective social-care homes or facilities

established prior to the effective date of these regulations may have their use continued if they conform, or are made to conform, to the following provisions.

**1231.6.1 Use of floors.** The use of floor levels in buildings of Type III, IV or V nonfire-rated construction may be as follows:

Ambulatory—first floor only;

Ambulatory—not higher than the third-floor level, provided walls and partitions are constructed of materials equal in fire-resistive quality to that of wood lath and plaster in good repair and all walls are firestopped at each floor level.

**1231.6.2 Enclosure of exits and vertical openings.** Except for two-story structures housing ambulatory guests, all interior stairs shall be enclosed in accordance with Chapter 10. In lieu of stairway enclosures, floor separations or smoke barriers may be provided in such a manner that fire and smoke will not spread rapidly to floors above or otherwise impair exit facilities. In these instances, floor separations or smoke barriers shall have a fire resistance equal to not less than  $\frac{1}{2}$ -inch (12.7 mm) gypsum wall board on each side of wood studs with openings protected by not less than a  $1\frac{3}{4}$ -inch (44 mm) solid bonded wood-core door of the self-closing type. All other vertical openings shall be enclosed in accordance with the provisions of Chapter 7.

**1231.6.3 Exit access.** Each floor or portion thereof of buildings used for the housing of existing protective social-care homes or facilities shall have access to not less than two exits in such a manner as to furnish egress from the building or structure in the event of an emergency substantially equivalent to the provisions of Chapter 10.

**1231.6.4 Corridor openings.** Openings from rooms to interior corridors shall be protected by not less than 13 $\frac{1}{4}$ -inch (44 mm) solid-bonded wood-core doors. Transoms and other similar openings shall be sealed with materials equivalent to existing corridor wall construction.

**1231.6.5 Interior wall and ceiling finishes.** Shall conform to the requirements for a Group R, Division 1 occupancy as specified in Chapter 8.

**1231.6.6 Automatic sprinkler systems.** Shall be installed in existing protective social-care occupancies in accordance with the provisions of Chapter 9.

**1231.6.7 Fire alarm systems.** Automatic fire alarm systems shall be installed in existing protective social-care homes or facilities in accordance with the provisions of Chapter 9.

**Exception:** When an approved automatic sprinkler system conforming to Chapter 9 is installed, a separate fire alarm system as specified in this subsection need not be provided.

## SECTION 1232 Reserved

## SECTION 1233

### Reserved

## SECTION 1234

### Reserved

## SECTION 1235 [DPH]

### SANITARY CONTROL OF SHELLFISH (PLANTS AND OPERATIONS)

**1235.1 Culling plants.** Culling plants shall be located in areas free from unsanitary conditions and faulty sewage disposal. They shall be provided with an ample supply of water under adequate pressure from a source approved by the Department of Health Services for the purpose of hosing down floor and benches and cleaning the shellfish. Floors and premises shall be kept in a clean and sanitary condition.

**1235.2 Plant arrangement.** Unless shellfish are shucked directly into packing containers with no further processing, the shucking and packing processes shall be done in separate rooms. There shall be installed in the partition between the two rooms a delivery window through which the shucked stock is passed to the packing room. Provision shall be made for storing the employees' outer garments, aprons, gloves, etc., in a separate room.

**Note:** In special instances where shucking is done on a small scale for local retail sales, shucking and packing may be permitted in a single room if approved by the Department of Health Services. This single room and all operations shall conform to all requirements of these regulations except that of separate shucking and packing rooms. "Limited" certificates shall be issued in these instances and all containers of shucked shellfish shall be clearly labeled or marked with words "Limited Certificate" and the appropriate certificate number.

**1235.3 Floors.** The floors of all rooms in which shellfish are stored, shucked, washed, packed or otherwise processed shall be constructed of concrete or other equally impervious material, graded to drain quickly, free from cracks or uneven surfaces that might interfere with proper cleaning or drainage, and maintained in clean and satisfactory condition.

**1235.4 Walls and ceilings.** Walls and ceilings shall be maintained in a smooth, clean, washable, light-colored conditions. They shall be impervious to moisture and shall be kept in good repair. Walls contiguous to benches shall, to a height of 2 feet (610 mm) above the bench top, be of smooth concrete, metal or equally nonabsorbent material.

**1235.5 Screening.** The plant shall have all openings effectively screened, unless other effective means are provided to prevent the entrance of flies and other insects.

**1235.6 Light.** Ample light to work by shall be provided in all working rooms. A light intensity of not less than 10 footcandles (108 lux) shall be maintained on all working surfaces when workers are at their working positions.

**1235.7 Ventilation.** Adequate ventilation shall be provided to prevent condensation on ceilings or other surfaces.

**1235.8 Toilet facilities.** Every shellfish culling, shucking, packing or repacking plant shall be provided with clean and adequate toilet facilities conveniently located. No toilet room shall be used for the storage of garments, food products, containers or equipment. Construction and maintenance of toilets shall comply with all local and state regulations.

**1235.9 Handwashing facilities.** An adequate number of lavatories shall be provided at locations convenient to toilet rooms and shellfish handling operations, including running hot and cold water, soap and individual disposal towels. The use of a common towel is prohibited. All employees shall wash their hands thoroughly with running water and soap on beginning work and after each visit to the toilet. Signs to this effect shall be posted in conspicuous places in the plant and in the toilet rooms.

**1235.10 Sewers and drains.** Sewage and other liquid wastes shall be discharged into public sewers wherever possible. Where private sewage or waste disposal systems must be utilized, they shall be constructed in accordance with state and local regulations pertaining thereto. Plant waste systems shall be properly trapped and vented. Waste liquids shall be disposed of in a manner that will not adversely affect the quality of the water in which shellfish are grown or stored. Waste lines from washing machines shall have suitable protection against the possibility of sewage or wastes entering these machines.

**1235.11 Water supply.** Shucking, packing or repacking plants shall be provided with an ample supply of water under adequate pressure from a source approved by the Department of Health Services. The supply shall be accessible to all parts of the plant, adequate in quantity, and of a safe sanitary quality. No cross connections with unapproved supplies or other possible sources of contamination shall be permitted.

## SECTION 1236 [DPH] LABORATORY ANIMAL QUARTERS

Laboratory animal quarters shall meet the requirements of Part 12 California Referenced Standards Code, Chapter 12-4A, Section 12-4A-101.

See the 2010 Edition, Title 24, Part 12, Chapter 12-4A.

## SECTION 1237 [DPH] WILD ANIMAL QUARANTINE FACILITIES

**1237.1 Scope.** The provisions of this section are intended to provide standards for the quarantine of wild animals.

**1237.2 Definitions.** For the purpose of this chapter, the following terms shall have the meaning indicated:

**ESCAPEPROOF** is a condition that will prohibit unintended release of wild animals from their quarantine enclosure.

**HOUSING FACILITY** is a room, building or area used to contain a primary enclosure or enclosures for animal quarantine.

**PRIMARY ENCLOSURE** is a structure used to immediately restrict an animal or animals to a limited amount of space,

such as a room, pen, run, cage or compartment within the quarantine facility.

**QUARANTINE FACILITY** is a facility for the quarantine confinement of imported wild animals.

**SPACE CONDITIONING** is the regulation of ambient temperature.

### 1237.3 Construction.

**1237.3.1 General.** Housing facilities used for quarantine shall be constructed in accordance with these provisions and Group B occupancy requirements.

**1237.3.2 Entry.** Quarantine housing facilities shall restrict the entry of other animals and unauthorized persons by locking or bolting devices or other equipment methods.

Rooms containing primary enclosures shall be entered through double doors that maintain a minimum distance of 4 feet (1219 mm) between doors permitting closure of one door before the second is opened.

All animals must be visible through a viewpoint from the entry area.

Windows to the outside shall be escapeproof.

One handwashing sink shall be provided in each room in which animals are quarantined.

**1237.3.3 Special provision.** The interior building surfaces of housing facilities shall be smooth and impervious to moisture.

**1237.4 Light and ventilation.** All portions of the wild animal quarantine facility shall be space conditioned to maintain the health of the wild animals. Ventilation shall be provided in housing facilities so as not to create a health hazard by one or more of the following methods.

1. Openable windows
2. Doors
3. Vents
4. Air conditioning
5. Fans

Uniformly distributed illumination of not less than 50 footcandles (538 lux) at least the level of the cage racks shall be provided.

**1237.5 Primary enclosure.** Primary enclosures shall be capable of containing quarantined animals and excluding access by other animals. Enclosures shall provide space to allow each animal to make normal postural adjustments with freedom of movement and maintain social activity. Primates shall be provided with a minimum floor space equal to an area of at least three times the area occupied by such primates when standing on four feet.

## SECTION 1238 Reserved

## SECTION 1239

### Reserved

## SECTION 1240 [AGR]

### MEAT AND POULTRY PROCESSING PLANTS

**1240.1 General construction.** The buildings shall be of sound construction and kept in good repair.

**1240.1.1** The doors, windows, skylights and other outside openings of the plant, shall be protected by fitted screens or other devices, such as air screens, against the entrance of flies and other insects.

**1240.1.2** Outside doors shall be hung so as to be close fitting when closed.

**1240.1.3** Rooms or compartments used for edible products shall be separated and distinct from inedible products departments and from rooms where live poultry are held or slaughtered. Separate rooms shall be provided when required for conducting processing operations in a sanitary manner; and all rooms shall be able to accommodate equipment for processing operations.

**Note:** In the event of specific conflict, in federally inspected plants, between the provisions of Title 24 and federal regulations, the federal regulations shall take precedence.

**1240.1.4** The rooms and compartments in which any product is prepared or handled shall be free from objectionable odors.

**1240.1.5** The outer premises of every official establishment, including docks and areas where cars and vehicles are loaded, and the driveways, approaches, yards, pens and alleys shall be paved.

**1240.2 Refuse rooms.** A separate refuse room shall be required in official establishments where accumulations of refuse occur. Refuse rooms shall be entirely separate from other rooms in the establishment, and shall provide for the following:

1. Tight fitting doors.
2. Ventilation.
3. Drainage.
4. Cleanup facilities.
5. Floors and walls to a height of 6 feet (1829 mm) above the floor shall be impervious to moisture.
6. Wall above 6 feet (1829 mm), and ceilings shall be moisture resistant.

**1240.3 Rooms for holding carcasses for further inspection.** Room or other acceptable facilities in which carcasses or parts thereof are held for further inspection shall be in such numbers and such locations as needs of the inspection in the establishment may require. These rooms or facilities shall be equipped with hasps for locking.

**1240.4 Coolers and freezers.** Coolers and freezers shall be of adequate size and capacity and have cooling capability to fully enable compliance with the regulations governing the

inspection of meat and poultry and meat and poultry products.

**1240.5 Boiler room.** The boiler room shall be a separate room where necessary to prevent dirt and objectionable odors entering from it into any room where dressed poultry or poultry products are prepared, handled or stored.

**1240.6 Inspector's office.** Office space for the use of government personnel shall be provided. The room or space must meet the approval of the inspection service and provide for the following:

1. Light
2. Heat
3. Ventilation
4. Desk space
5. File cabinets

**1240.7 Facilities for program employees.** Establishments shall have facilities for program employees.

**1240.8 Lunch rooms.** Lunch rooms or lunch areas separate from the processing, packing or supply rooms shall be provided in establishments where employees eat their lunches.

**1240.9 Floors.** All floors in rooms where exposed products are prepared or handled shall be constructed of, or finished with, materials impervious to moisture. The floors in killing, ice cooling, ice packing, eviscerating, cooking, boning and cannery rooms shall be graded for complete runoff with no standing water.

**1240.10 Walls, posts, partitions and doors.** All walls, posts, partitions and doors in rooms where exposed products are prepared or handled shall be smooth and constructed of materials impervious to moisture to a height of at least 8 feet (2438 mm) above the floor. All surfaces above this height must be smooth and finished with moisture-resistant material.

**1240.11 Ceilings.** Ceilings must be moisture resistant in rooms where exposed products are prepared or handled, finished and sealed.

**1240.12 Rails.** Rails should be located and passageway space provided so that exposed product does not come in contact with posts, walls and other fixed parts of the building, or with barrels, boxes or other containers trafficked through holding and operation areas.

**1240.13 Lighting.** There shall be either natural or artificial light or both for all rooms and compartments.

**1240.13.1** All rooms in which poultry or livestock are killed, eviscerated or otherwise processed shall have at least 30 foot-candles (323 lux) of light intensity on all working surfaces.

#### **Exceptions:**

1. At the inspection stations such light intensity shall be at least 50 footcandles (538 lux).
2. In all other rooms in which poultry or livestock are not killed, eviscerated or otherwise processed, there shall be provided at least 5 footcandles (54 lux) of light intensity when measured at a distance of 30 inches (762 mm) from the floor.

**1240.14 Ventilation.** There shall be either natural or artificial ventilation, adequate to control odors, vapors, and condensation to the extent necessary to prevent adulteration of product and the creation of insanitary conditions, in all rooms and compartments.

**1240.14.1** Freezing rooms, other than those for plate freezers or liquid freezing, shall have forced-air circulation, and freezers and coolers shall be equipped with floor racks or pallets unless other means are used which will assure that products will be maintained in a wholesome condition.

**1240.14.2** Toilet rooms shall be ventilated to the outside of the building.

**1240.15 Lavatories, toilets and other sanitary facilities.**

**1240.15.1** Lavatory and toilet accommodations, including but not limited to, running hot and cold water, shall be provided as follows in Table 1240.15.1.

**TABLE 1240.15.1**

PERSONS OF SAME SEX	TOILET BOWLS REQUIRED
1 to 15, inclusive	1
1 to 15, inclusive	2
1 to 15, inclusive	3*
1 to 15, inclusive	4*
For each additional 30 persons in excess of 80	1*

\* Urinals may be substituted for toilet bowls, but only to the extent of one third of the total number of bowls stated.

**1240.15.2** Lavatories shall be in or adjacent to toilet and locker rooms and at other places in the plant to provide for the cleanliness of all personnel handling products.

**1240.15.3** Toilet rooms opening directly into rooms where products are exposed shall have self-closing doors.

**1240.15.4** Dressing rooms and toilet rooms shall be provided in each establishment and shall be ample in size and readily accessible. They shall be separated from the rooms and compartments in which products are prepared, stored or handled. Where both sexes are employed, separate facilities shall be provided.

**1240.15.5** Lockers or other facilities shall be provided for employees' wearing apparel and for the storing and changing of clothing. Lockers shall not be located in rooms where processing operations are conducted.

**1240.15.6** Handwashing facilities serving areas where dressed livestock and poultry carcasses and parts and meat and poultry products are prepared shall be operated by other than hand-operated controls, or shall be continuous flow type that provides flow of water for washing hands.

**1240.15.7 Catch basins.** All catch basins on the premises shall accommodate the provisions of Section 1243.5.

**SECTION 1241 [AGR]  
COLLECTION CENTERS AND FACILITIES**

**1241.1 General construction.**

**1241.1.1** Collection centers shall have facilities for the storage of carcasses and parts of dead animals and the cleaning and sanitizing of vehicles.

**1241.1.2** Buildings used for the temporary storage of animal carcasses, packinghouse wastes and other products before transportation to a licensed rendering plant shall be of sound construction and shall be of such construction as to prevent the entrance or harboring of vermin.

**1241.1.3** The floors, walls, ceilings, partitions and doors shall be of such material, construction and finish as to make them readily cleanable.

**1241.1.4** The area for the cleaning and sanitizing of vehicles shall be provided with adequate live steam or hot water, producing a temperature of at least 180°F (82°C), or other method for sanitizing vehicles.

**1241.1.5** Facilities shall be provided for the holding and disposal of solid waste resulting from the cleaning operation. Such facilities shall be accessible and easily cleaned and so constructed as to prevent the entrance or harborage of vermin, flies and other insects.

**1241.1.6** The cleaning and sanitizing of vehicles shall be done on a slab of concrete or other material approved by the Department, which is sloped to drains so as to permit the rapid runoff of water.

**1241.1.7** Carcasses and packinghouse waste. The unloading slab shall be of sufficient size to hold all animal carcasses and packinghouse waste material, be constructed of concrete or other material approved by the Department and sloped to drains so as to permit the rapid runoff of water.

**1241.2 Floors.** Floors of rooms in which carcasses and packinghouse wastes are received or stored shall be graded to permit runoff of water with no standing water. In new construction and in renovated buildings where floors are to be resurfaced, the pitch shall not be less than 1/4 inch per foot (2 percent) to drains.

**1241.3 Lavatories and toilets.** Modern lavatory accommodations, including running hot and cold water, shall be provided except where the Department determines that they are not necessary.

**SECTION 1242 [AGR]  
RENDERERS**

**1242.1 General construction.**

**1242.1.1 Separation from other businesses.** Every licensed rendering establishment shall be separate and distinct from any establishments in which any meat, meat byproducts, poultry, or poultry byproducts are handled and from any other business at the discretion of the Department.

**1242.1.2** The cleaning and sanitizing of vehicles shall be done on a slab of concrete or other material approved by the Department; which is sloped to drains so as to permit the rapid runoff of water.

**SECTION 1243 [AGR]****HORSEMEAT AND PET FOOD ESTABLISHMENTS**

**1243.1 Scope.** In the event of specific conflict between the provisions of Title 24 and federal regulations, the federal regulations shall take precedence in establishments under federal inspection.

**1243.2 General.**

**1243.2.1 Facilities for program employees.** Office space, including light and heat shall be provided by official establishments for the inspector and other program employees. The office space shall be conveniently located and adequately ventilated, heated, cooled, and provided with adequate desk and file space.

**1243.2.2 Final inspection places.**

**1243.2.2.1 Final inspection places** shall, by size, rail arrangement and other equipment, prevent contamination of edible carcasses or parts by inedible carcasses or parts.

**1243.2.2.2 Floors.** The floors shall be of such construction as to facilitate the maintenance of sanitary conditions and shall have drainage connections. When the final inspection place is part of a larger floor, it shall be separated from the rest of the floor by a curb, railing or otherwise.

**1243.2.3 Docks and receiving rooms.** Docks and receiving rooms shall be provided.

**1243.2.4** The floors, walls, ceilings, partitions, posts, doors and other parts of all structures shall be of such material, construction and finish as will make them readily and thoroughly cleanable. The floors shall be kept watertight.

**1243.2.5 Rails.** Rails shall be located and passageway space provided, so that exposed product does not come in contact with post, walls and other fixed parts of the building, or with barrels, boxes and other containers trafficked through holding and operation areas.

**1243.2.6** The rooms and compartments used for edible products shall be separated and distinct from those used for inedible products.

**1243.2.7** The rooms and compartments in which any product is prepared or handled shall be free from objectionable odor.

**1243.2.8** Precaution shall be taken to exclude flies, rats, mice and other vermin from official establishments.

**1243.2.9** The outer premises of horsemeat and pet food establishments shall meet the requirements of Section 1240.1.5.

**1243.3 Lighting.** There shall be light and ventilation for all rooms and compartments.

**1243.4 Sanitary facilities and accommodations.** Sanitary facilities and accommodations shall be furnished by every official establishment.

**1243.4.1 Dressing rooms and toilet rooms** shall be provided in each establishment and shall be ample in size and readily accessible. They shall be separated from the rooms

and compartments in which products are prepared, stored or handled. Where both sexes are employed, separate facilities shall be provided.

**1243.4.2 Lavatories,** including running hot and cold water, shall be placed in or adjacent to toilet and urinal rooms and at other places in the establishment to assure cleanliness of all persons handling any product.

**1243.4.3 Facilities** shall be provided for cleansing and disinfecting utensils.

**1243.5 Catch basins.** All catch basins on the premises shall be of such construction and location to ensure they are kept clean and odorless. Catch basins shall not be located in department where any product is prepared, handled or stored.

**1243.6 Final inspection space.** Such spaces shall be equipped with hot water and a lavatory.

**SECTION 1244**  
**Reserved****SECTION 1245**  
**Reserved****SECTION 1246**  
**Reserved****SECTION 1247**  
**Reserved****SECTION 1248**  
**Reserved****SECTION 1249**  
**Reserved****SECTION 1250 [CA]**  
**PHARMACIES**

**1250.1 Application.** This section applies to pharmacies listed in Section 1.4.1 regulated by the Department of Consumer Affairs.

**1250.2 Restrooms.** A pharmacy shall maintain a readily accessible restroom. The restroom shall contain a toilet and washbasin supplied with running water.

**1250.3 Sink.** All pharmacies shall be equipped with a sink within the pharmacy for pharmaceutical purposes. The sink shall be supplied with hot and cold running water.

**1250.4 Compounding area for parenteral solutions.** The pharmacy shall have a designated area for the preparation of sterile products for dispensing which shall:

1. In accordance with Federal Standard 209 (b), Clean Room and Work Station Requirements, Controlled

- Environment as approved by the Commission, Federal Supply Service, General Service Administration meet standards for Class 100 HEPA (high efficiency particulate air) filtered air such as laminar airflow hood or clean room.*
2. *Have nonporous and cleanable surfaces, ceilings and ceiling tiles, walls, floors and floor coverings.*
  3. *The pharmacy shall be arranged in such a manner that the laminar-flow hood is located in an area which is exposed to minimal traffic flow, and is separate from any area used for bulk storage of items not related to the compounding of parenteral solutions.*

*There shall be sufficient space, well separated from the laminar-flow hood area for the storage of bulk materials, equipment and waste materials.*

4. *A sink with hot and cold running water must be within the parenteral solution compounding area or adjacent to it.*
5. *Any pharmacy that compounds sterile injectable products from one or more nonsterile ingredients must compound the medication in one of the following environments:*
  - 5.1 *An ISO class 5 laminar airflow hood within an ISO class 7 cleanroom. The cleanroom must have a positive air pressure differential relative adjacent areas.*
  - 5.2 *An ISO class 5 cleanroom.*
  - 5.3 *A barrier isolator that provides an ISO class 5 environment for compounding.*

*Note: For additional pharmacy mechanical standard requirements, see Chapter 5, California Mechanical Code.*

## **SECTION 1251 [CA] VETERINARY FACILITIES**

**1251.1** All premises where veterinary medicine, veterinary dentistry or veterinary surgery is being practiced, and all instruments, apparatus and apparel used in connection with those practices, shall be kept clean and sanitary at all times and shall conform to the standards of this section.

**1251.2** Indoor lighting for halls, wards, reception areas and examining and surgical rooms shall be adequate for their intended purpose. All surgical rooms shall be provided with emergency lighting.

**1251.3** A veterinary facility where animals are housed shall contain the following:

1. *A reception room and office, or a combination of the two.*
2. *An examination room separate from other areas of the facility and of sufficient size to accommodate the doctor, assistant, patient and client.*
3. *A surgery room separate and distinct from all other rooms.*

**4. Housing.** In those veterinary hospitals where animals are retained for treatment or hospitalization, the following shall be provided:

- 4.1. *Separate compartments, one for each animal, maintained in a sanitary manner so as to assure comfort.*
- 4.2. *Facilities allowing for the effective separation of contagious and noncontagious cases.*
- 4.3. *Exercise runs which provide and allow effective separation of animals and their waste products.*

*Note: Where animals are kept in clinics for 24 hours or more, walking the animal meets this requirement.*

### **1251.4 Practice management.**

**1251.4.1** Veterinary facilities shall maintain a sanitary environment to avoid sources and transmission of infection. This is to include the proper routine of disposal of waste materials and proper sterilization or sanitation of all equipment used in diagnosis or treatment.

**1251.4.2** Fire precautions shall meet the requirements of local and state fire prevention codes.

**1251.4.3** The temperature and ventilation of the facility shall be maintained so as to assure the comfort of all patients.

**1251.4.4** The veterinary facility must have the capacity to render adequate diagnostic radiological services, either in the hospital or through other commercial facilities. Radiological procedures shall be in accordance with state public health standards.

**1251.4.5** Sanitary methods for the disposal of deceased animals shall be provided and maintained. Where the owner of a deceased animal has not given the veterinarian authorization to dispose of the animal, the veterinarian shall be required to retain the carcass in a freezer for at least 14 days.

## **SECTION 1252 [CA] BARBER COLLEGES AND SHOPS**

**1252.1 Barber college floors.** Floors of barber colleges shall be covered with hardwood, linoleum, asphalt tile or some other washable and nonporous material other than paint.

**1252.2 Barber shop floors.** Floors of barber shops shall be covered with hardwood, linoleum, asphalt tile, carpeting or some other washable material other than paint.

**1252.3 Barber shop washbasin(s) and lavatory(ies).** A barber shop owner shall provide washbasin(s) or lavatory(ies) within the working area of the barber shop.

**1252.4 Minimum barber shop size.** A barber shop shall be a minimum of 8 feet (2438 mm) wide, 8 feet (2438 mm) long, with an 8-foot (2438 mm) ceiling.

**1252.5 Barber college premises.** In a college of barbershop, the room for practical work and demonstrations shall be at least 14 feet (4267 mm) wide for one row of barber chairs and shall be at least 20 feet (6096 mm) wide for two rows of chairs.

**SECTION 1253 [CA]**  
**SCHOOLS OF COSMETOLOGY,**  
**COSMETOLOGICAL ESTABLISHMENTS AND**  
**SATELLITE CLASSROOMS**

**1253.1 Floor space.**

**1253.1.1 Schools of cosmetology.** *The minimum floor space in any school of cosmetology premises shall be 3,000 square feet ( $279\text{ m}^2$ ), not less than 2,000 square feet ( $185.8\text{ m}^2$ ) of which shall be provided for the working, practice and classroom areas.*

**Exception:** *When the average daily attendance for either day or night school in a school of cosmetology exceeds 50 students for a period of three months, an additional 30 square feet ( $2.8\text{ m}^2$ ) of floor space shall be required for each additional student after the first 50, which shall be provided for the working, practice and classroom areas.*

**1253.1.2 Schools of electrology.** *The minimum floor space in any school of electrology premises shall be 1,000 square feet ( $93\text{ m}^2$ ), not less than 600 square feet ( $55.7\text{ m}^2$ ) of which shall be provided for the working, practice and classroom areas.*

**Exception:** *When the average daily attendance for either day or night school of electrology exceeds 15 students, an additional 30 square feet ( $2.8\text{ m}^2$ ) of floor space shall be required for each additional student after the first 15, which shall be provided for working, practice and classroom areas.*

**1253.1.3 Satellite classrooms.** *The minimum floor space in any satellite classroom of a school of cosmetology or electrology shall be 1,000 square feet ( $93\text{ m}^2$ ).*

**Exception:** *For each additional student after the first 50, an additional 20 square feet ( $1.9\text{ m}^2$ ) of floor space shall be required.*

**1253.2 Floor finish.** *The floors in the toilet area of each school and establishment shall be of nonabsorbent material.*

**1253.3 Ceiling height.** *The minimum ceiling height of the practice and classroom areas of school premises shall be at least 9 feet (2743 mm) in height.*

**SECTION 1254 [CA]**  
**ACUPUNCTURE OFFICES**

**1254.1 Acupuncture offices.** *Every acupuncture office shall have a readily accessible bathroom facility which shall be maintained in a clean and sanitary condition at all times. In addition, there shall be a sink with hot and cold running water in or near each treatment room.*



## **CHAPTER 13**

# **ENERGY EFFICIENCY**

*Refer to California Energy Code, Title 24, Part 6.*



## CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE

### CHAPTER 14 – EXTERIOR WALLS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter	X																			
Adopt entire chapter as amended (amended sections listed below)			X	X			X	X	X	X		X								
Adopt only those sections that are listed below		X																		
Chapter / Section																				
1401		X																		
1402		X																		
1403.4		X																		
1403.5		X																		
1404		X																		
1405		X																		
1405.1.1							X	X	X	X		X								
1405.3		X	X																	
1405.3.1		X	X																	
Table 1405.3.1		†	†																	
1406		X																		
1407		X																		
1408		X																		
1410							X	X	X	X		X								

The state agency does not adopt sections identified by the following symbol: †

*The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 1.11.*



## CHAPTER 14

# EXTERIOR WALLS

### SECTION 1401 GENERAL

**1401.1 Scope.** The provisions of this chapter shall establish the minimum requirements for exterior walls; exterior wall coverings; exterior wall openings; exterior windows and doors; architectural trim; balconies and similar projections; and bay and oriel windows.

### SECTION 1402 DEFINITIONS

**1402.1 Definitions.** The following terms are defined in Chapter 2:

**ADHERED MASONRY VENEER.**

**ANCHORED MASONRY VENEER.**

**BACKING.**

**EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS).**

**EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE.**

**EXTERIOR WALL.**

**EXTERIOR WALL COVERING.**

**EXTERIOR WALL ENVELOPE.**

**FIBER-CEMENT SIDING.**

**HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL).**

**HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL) SYSTEM.**

**METAL COMPOSITE MATERIAL (MCM).**

**METAL COMPOSITE MATERIAL (MCM) SYSTEM.**

**POLYPROPYLENE SIDING.**

**PORCELAIN TILE.**

**VENEER.**

**VINYL SIDING.**

**WATER-RESISTIVE BARRIER.**

### SECTION 1403 PERFORMANCE REQUIREMENTS

**1403.1 General.** The provisions of this section shall apply to exterior walls, wall coverings and components thereof.

**1403.2 Weather protection.** Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.4. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-

resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section 1405.3.

**Exceptions:**

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.4, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
  - 2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
  - 2.2. Exterior wall envelope test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.
  - 2.3. Exterior wall envelope assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m<sup>2</sup>).
  - 2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours.

The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

3. Exterior insulation and finish systems (EIFS) complying with Section 1408.4.1.

**1403.3 Structural.** Exterior walls, and the associated openings, shall be designed and constructed to resist safely the superimposed loads required by Chapter 16.

**1403.4 Fire resistance.** Exterior walls shall be fire-resistance rated as required by other sections of this code with opening protection as required by Chapter 7.

**1403.5 Vertical and lateral flame propagation.** Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane

and contain a combustible water-resistive barrier shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

**1403.6 Flood resistance.** For buildings in flood hazard areas as established in Section 1612.3, exterior walls extending below the elevation required by Section 1612 shall be constructed with flood-damage-resistant materials. Wood shall be pressure-preserved treated in accordance with AWPA U1 for the species, product and end use using a preservative listed in Section 4 of AWPA U1 or decay-resistant heartwood of redwood, black locust or cedar.

**1403.7 Flood resistance for high-velocity wave action areas.** For buildings in flood hazard areas subject to high-velocity wave action as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through exterior walls that are designed to break away under flood loads.

## SECTION 1404 MATERIALS

**1404.1 General.** Materials used for the construction of exterior walls shall comply with the provisions of this section. Materials not prescribed herein shall be permitted, provided that any such alternative has been approved.

**1404.2 Water-resistive barrier.** A minimum of one layer of No.15 asphalt felt, complying with ASTM D 226 for Type 1 felt or other approved materials, shall be attached to the studs or sheathing, with flashing as described in Section 1405.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer.

**1404.3 Wood.** Exterior walls of wood construction shall be designed and constructed in accordance with Chapter 23.

**1404.3.1 Basic hardboard.** Basic hardboard shall conform to the requirements of AHA A135.4.

**1404.3.2 Hardboard siding.** Hardboard siding shall conform to the requirements of AHA A135.6 and, where used structurally, shall be so identified by the label of an approved agency.

**1404.4 Masonry.** Exterior walls of masonry construction shall be designed and constructed in accordance with this section and Chapter 21. Masonry units, mortar and metal accessories used in anchored and adhered veneer shall meet the physical requirements of Chapter 21. The backing of anchored and adhered veneer shall be of concrete, masonry, steel framing or wood framing.

**1404.5 Metal.** Exterior walls of formed steel construction, structural steel or lightweight metal alloys shall be designed in accordance with Chapters 22 and 20, respectively.

**1404.5.1 Aluminum siding.** Aluminum siding shall conform to the requirements of AAMA 1402.

**1404.5.2 Cold-rolled copper.** Copper shall conform to the requirements of ASTM B 370.

**1404.5.3 Lead-coated copper.** Lead-coated copper shall conform to the requirements of ASTM B 101.

**1404.6 Concrete.** Exterior walls of concrete construction shall be designed and constructed in accordance with Chapter 19.

**1404.7 Glass-unit masonry.** Exterior walls of glass-unit masonry shall be designed and constructed in accordance with Chapter 21.

**1404.8 Plastics.** Plastic panel, apron or spandrel walls as defined in this code shall not be limited in thickness, provided that such plastics and their assemblies conform to the requirements of Chapter 26 and are constructed of approved weather-resistant materials of adequate strength to resist the wind loads for cladding specified in Chapter 16.

**1404.9 Vinyl siding.** Vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D 3679 by an approved quality control agency.

**1404.10 Fiber-cement siding.** Fiber-cement siding shall conform to the requirements of ASTM C 1186, Type A, and shall be so identified on labeling listing an approved quality control agency.

**1404.11 Exterior insulation and finish systems.** Exterior insulation and finish systems (EIFS) and exterior insulation and finish systems (EIFS) with drainage shall comply with Section 1408.

**1404.12 Polypropylene siding.** Polypropylene siding shall be certified and labeled as conforming to the requirements of ASTM D 7254 and those of Section 1404.12.1 or 1404.12.2 by an approved quality control agency. Polypropylene siding shall be installed in accordance with the requirements of Section 1405.18 and in accordance with the manufacturer's installation instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

**1404.12.1 Flame spread index.** The certification of the flame spread index shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E 84 or UL 723.

**1404.12.2 Fire separation distance.** The fire separation distance between a building with polypropylene siding and the adjacent building shall be no less than 10 feet (3048 mm).

## SECTION 1405 INSTALLATION OF WALL COVERINGS

**1405.1 General.** Exterior wall coverings shall be designed and constructed in accordance with the applicable provisions of this section.

**1405.1.1 Additional requirements. [DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4]** In addition to the requirements of Sections 1405.6, 1405.7, 1405.8, 1405.9, and 1405.10, the installation of anchored or adhered veneer shall comply with applicable provisions of Section 1410.

**1405.2 Weather protection.** Exterior walls shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1405.2 shall be acceptable as approved weather coverings.

**1405.3 Vapor retarders.** Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 of the *California Energy Conservation Code*.

**[HCD 1 & HCD 2]** Class I or II vapor retarders shall be provided on the interior side of frame walls of low-rise residential buildings as required in Title 24, Part 6, the California Energy Code (see definition of "Low-rise residential building").

### Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

**1405.3.1 Class III vapor retarders.** Class III vapor retarders shall be permitted where any one of the conditions in Table 1405.3.1 is met.

**[HCD 1 & HCD 2]** Class III vapor retarders shall be permitted where any one of the conditions in Items 1, 2 or 3 below are met. This section shall apply to "Low-rise residential buildings" as defined in Title 24, Part 6, the California Energy Code.

1. Vented cladding over fiberboard
2. Vented cladding over gypsum
3. Insulated sheathing with R-value  $\geq R4$

Spray foam with a minimum density of 2 lbs/ft<sup>3</sup> applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

TABLE 1405.2  
MINIMUM THICKNESS OF WEATHER COVERINGS

COVERING TYPE	MINIMUM THICKNESS (inches)
Adhered masonry veneer	0.25
Aluminum siding	0.019
Anchored masonry veneer	2.625
Asbestos-cement boards	0.125
Asbestos shingles	0.156
Cold-rolled copper <sup>d</sup>	0.0216 nominal
Copper shingles <sup>d</sup>	0.0162 nominal
Exterior plywood (with sheathing)	0.313
Exterior plywood (without sheathing)	See Section 2304.6
Fiber cement lap siding	0.25 <sup>c</sup>
Fiber cement panel siding	0.25 <sup>c</sup>
Fiberboard siding	0.5
Glass-fiber reinforced concrete panels	0.375
Hardboard siding <sup>c</sup>	0.25
High-yield copper <sup>d</sup>	0.0162 nominal
Lead-coated copper <sup>d</sup>	0.0216 nominal
Lead-coated high-yield copper	0.0162 nominal
Marble slabs	1
Particleboard (with sheathing)	See Section 2304.6
Particleboard (without sheathing)	See Section 2304.6
Porcelain tile	.025
Precast stone facing <sup>e</sup>	0.625
Steel (approved corrosion resistant)	0.0149
Stone (cast artificial, anchored)	1.5
Stone (natural)	2
Structural glass	0.344
Stucco or exterior cement plaster	
Three-coat work over:	
Metal plaster base	0.875 <sup>b</sup>
Unit masonry	0.625 <sup>b</sup>
Cast-in-place or precast concrete	0.625 <sup>b</sup>
Two-coat work over:	
Unit masonry	0.5 <sup>b</sup>
Cast-in-place or precast concrete	0.375 <sup>b</sup>
Terra cotta (anchored)	1
Terra cotta (adhered)	0.25
Vinyl siding	0.035
Wood shingles	0.375
Wood siding (without sheathing) <sup>a</sup>	0.5

For SI: 1 inch = 25.4 mm.

a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6.

b. Exclusive of texture.

c. As measured at the bottom of decorative grooves.

d. 16 ounces per square foot for cold rolled copper and lead coated copper, 12 ounces per square foot for copper shingles, high yield copper and lead coated high yield copper.

e. Includes scratch coat, setting bed, and precast stone.

## EXTERIOR WALLS

**TABLE 1405.3.1  
CLASS III VAPOR RETARDERS**

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR: <sup>a</sup>
Marine 4	Vented cladding over wood structural panels
	Vented cladding over fiberboard
	Vented cladding over gypsum
	Insulated sheathing with <i>R</i> -value $\geq$ R2.5 over 2 × 4 wall
	Insulated sheathing with <i>R</i> -value $\geq$ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels
	Vented cladding over fiberboard
	Vented cladding over gypsum
	Insulated sheathing with <i>R</i> -value $\geq$ R5 over 2 × 4 wall
	Insulated sheathing with <i>R</i> -value $\geq$ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard
	Vented cladding over gypsum
	Insulated sheathing with <i>R</i> -value $\geq$ R7.5 over 2 × 4 wall
	Insulated sheathing with <i>R</i> -value $\geq$ R11.25 over 2 × 6 wall
7 and 8	Insulated sheathing with <i>R</i> -value $\geq$ R10 over 2 × 4 wall
	Insulated sheathing with <i>R</i> -value $\geq$ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m<sup>3</sup>.

a. Spray foam with a minimum density of 2 lbs/ft<sup>3</sup> applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam *R* value meets or exceeds the specified insulating sheathing *R* value.

**1405.3.2 Material vapor retarder class.** The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, nonperforated aluminum foil.

Class II: Kraft-faced fiberglass batts or paint with a perm rating greater than 0.1 and less than or equal to 1.0.

Class III: Latex or enamel paint.

**1405.3.3 Minimum clear airspaces and vented openings for vented cladding.** For the purposes of this section, vented cladding shall include the following minimum clear airspaces.

1. Vinyl lap or horizontal aluminum siding applied over a weather-resistive barrier as specified in this chapter.
2. Brick veneer with a clear airspace as specified in this code.
3. Other approved vented claddings.

**1405.4 Flashing.** Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of exterior wall assemblies, exterior wall intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with pro-

jecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim.

**1405.4.1 Exterior wall pockets.** In exterior walls of buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with caps or drips, or other approved means shall be provided to prevent water damage.

**1405.4.2 Masonry.** Flashing and weep holes in anchored veneer shall be located in the first course of masonry above finished ground level above the foundation wall or slab, and other points of support, including structural floors, shelf angles and lintels where anchored veneers are designed in accordance with Section 1405.6.

**1405.5 Wood veneers.** Wood veneers on exterior walls of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior hardboard siding or 0.375-inch (9.5 mm) exterior-type wood structural panels or particleboard and shall conform to the following:

1. The veneer shall not exceed 40 feet (12 190 mm) in height above grade. Where fire-retardant-treated wood is used, the height shall not exceed 60 feet (18 290 mm) in height above grade.
2. The veneer is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.
3. Where open or spaced wood veneers (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

**1405.6 Anchored masonry veneer.** Anchored masonry veneer shall comply with the provisions of Sections 1405.6, 1405.7, 1405.8 and 1405.9 and Sections 6.1 and 6.2 of TMS 402/ACI 530/ASCE 5.

**1405.6.1 Tolerances.** Anchored masonry veneers in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 F1 of TMS 602/ACI 530.1/ASCE 6.

**1405.6.2 Seismic requirements.** Anchored masonry veneer located in Seismic Design Category C, D, E or F shall conform to the requirements of Section 6.2.2.10 of TMS 402/ACI 530/ASCE 5.

**1405.7 Stone veneer.** Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. With concrete or masonry backing, anchor ties shall be not less than 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, formed beyond the base of the backing. The legs of the loops shall be not less than 6 inches (152 mm) in length bent at right angles and laid in the mortar joint, and spaced so that the eyes or loops are 12 inches (305 mm) maximum on center (o.c.) in both directions. There shall be provided not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire tie, or approved equal, threaded through the exposed loops for every 2 square feet (0.2 m<sup>2</sup>) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length bent so that it will lie in the stone veneer

mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.

2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or non-metallic coated wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d annular threaded nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) zinc-coated or nonmetallic coated wire, or approved equal, attached to the stud with a minimum of an 8d (0.120 in. diameter) annular threaded nail for every 2 square feet (0.2 m<sup>2</sup>) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.
3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or nonmetallic coated wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c., and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. All screws shall extend through the steel connection a minimum of three exposed threads. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, attached to the stud with a minimum of a #8 self-drilling, tapping screw extending through the steel framing a minimum of three exposed threads for every 2 square feet (0.2 m<sup>2</sup>) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum bare steel thickness of 0.0428 inches (1.087 mm).

**1405.8 Slab-type veneer.** Slab-type veneer units not exceeding 2 inches (51 mm) in thickness shall be anchored directly to masonry, concrete or stud construction. For veneer units of marble, travertine, granite or other stone units of slab form ties of corrosion-resistant dowels in drilled holes shall be located in the middle third of the edge of the units, spaced a maximum of 24 inches (610 mm) apart around the periphery of each unit with not less than four ties per veneer unit. Units

shall not exceed 20 square feet (1.9 m<sup>2</sup>) in area. If the dowels are not tight fitting, the holes shall be drilled not more than 0.063 inch (1.6 mm) larger in diameter than the dowel, with the hole countersunk to a diameter and depth equal to twice the diameter of the dowel in order to provide a tight-fitting key of cement mortar at the dowel locations when the mortar in the joint has set. Veneer ties shall be corrosion-resistant metal capable of resisting, in tension or compression, a force equal to two times the weight of the attached veneer. If made of sheet metal, veneer ties shall be not smaller in area than 0.0336 by 1 inch (0.853 by 25 mm) or, if made of wire, not smaller in diameter than 0.1483-inch (3.76 mm) wire.

**1405.9 Terra cotta.** Anchored terra cotta or ceramic units not less than 1 $\frac{5}{8}$  inches (41 mm) thick shall be anchored directly to masonry, concrete or stud construction. Tied terra cotta or ceramic veneer units shall be not less than 1 $\frac{5}{8}$  inches (41 mm) thick with projecting dovetail webs on the back surface spaced approximately 8 inches (203 mm) o.c. The facing shall be tied to the backing wall with corrosion-resistant metal anchors of not less than No. 8 gage wire installed at the top of each piece in horizontal bed joints not less than 12 inches (305 mm) nor more than 18 inches (457 mm) o.c.; these anchors shall be secured to  $\frac{1}{4}$ -inch (6.4 mm) corrosion-resistant pencil rods that pass through the vertical aligned loop anchors in the backing wall. The veneer ties shall have sufficient strength to support the full weight of the veneer in tension. The facing shall be set with not less than a 2-inch (51 mm) space from the backing wall and the space shall be filled solidly with Portland cement grout and pea gravel. Immediately prior to setting, the backing wall and the facing shall be drenched with clean water and shall be distinctly damp when the grout is poured.

**1405.10 Adhered masonry veneer.** Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

**1405.10.1 Exterior adhered masonry veneer.** Exterior adhered masonry veneer shall be installed in accordance with Section 1405.10 and in accordance with the manufacturer's instructions.

**1405.10.1.1 Water-resistive barriers.** Water-resistive barriers shall be installed as required in Section 2510.6.

**1405.10.1.2 Flashing at foundation.** A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gauge galvanized or plastic with a minimum vertical attachment flange of 3 $\frac{1}{2}$  inches (89 mm) shall be installed to extend a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4. The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.

**1405.10.1.3 Clearances.** On exterior stud walls, adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth, or a minimum of 2 inches (51 mm) above paved areas, or a minimum of  $\frac{1}{2}$  inch (12 mm) above exterior walking surfaces which are supported by the same foundation that supports the exterior wall.

**1405.10.2 Exterior adhered masonry veneers—porcelain tile.** Adhered units shall not exceed  $\frac{5}{8}$  inch (15.8 mm) thickness and a maximum of 24 inches (610 mm) in any face dimension nor more than 3 square feet (0.28 m<sup>2</sup>) in total face area and shall not weigh more than 9 pounds psf (0.43 kN/m<sup>2</sup>). Porcelain tile shall be adhered to an approved backing system.

**1405.10.3 Interior adhered masonry veneers.** Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m<sup>2</sup>) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to  $\frac{1}{600}$  of the span of the supporting members.

**1405.11 Metal veneers.** Veneers of metal shall be fabricated from approved corrosion-resistant materials or shall be protected front and back with porcelain enamel, or otherwise be treated to render the metal resistant to corrosion. Such veneers shall not be less than 0.0149-inch (0.378 mm) nominal thickness sheet steel mounted on wood or metal furring strips or approved sheathing on the wood construction.

**1405.11.1 Attachment.** Exterior metal veneer shall be securely attached to the supporting masonry or framing members with corrosion-resistant fastenings, metal ties or by other approved devices or methods. The spacing of the fastenings or ties shall not exceed 24 inches (610 mm) either vertically or horizontally, but where units exceed 4 square feet (0.4 m<sup>2</sup>) in area there shall be not less than four attachments per unit. The metal attachments shall have a cross-sectional area not less than provided by W 1.7 wire. Such attachments and their supports shall be capable of resisting a horizontal force in accordance with the wind loads specified in Section 1609, but in no case less than 20 psf (0.958 kg/m<sup>2</sup>).

**1405.11.2 Weather protection.** Metal supports for exterior metal veneer shall be protected by painting, galvanizing or by other equivalent coating or treatment. Wood studs, furring strips or other wood supports for exterior metal veneer shall be approved pressure-treated wood or protected as required in Section 1403.2. Joints and edges exposed to the weather shall be caulked with approved durable waterproofing material or by other approved means to prevent penetration of moisture.

**1405.11.3 Backup.** Masonry backup shall not be required for metal veneer except as is necessary to meet the fire-resistance requirements of this code.

**1405.11.4 Grounding.** Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27 of this code.

**1405.12 Glass veneer.** The area of a single section of thin exterior structural glass veneer shall not exceed 10 square feet (0.93 m<sup>2</sup>) where it is not more than 15 feet (4572 mm) above the level of the sidewalk or grade level directly below, and shall not exceed 6 square feet (0.56 m<sup>2</sup>) where it is more than 15 feet (4572 mm) above that level.

**1405.12.1 Length and height.** The length or height of any section of thin exterior structural glass veneer shall not exceed 48 inches (1219 mm).

**1405.12.2 Thickness.** The thickness of thin exterior structural glass veneer shall be not less than 0.344 inch (8.7 mm).

**1405.12.3 Application.** Thin exterior structural glass veneer shall be set only after backing is thoroughly dry and after application of an approved bond coat uniformly over the entire surface of the backing so as to effectively seal the surface. Glass shall be set in place with an approved mastic cement in sufficient quantity so that at least 50 percent of the area of each glass unit is directly bonded to the backing by mastic not less than  $\frac{1}{4}$  inch (6.4 mm) thick and not more than  $\frac{5}{8}$  inch (15.9 mm) thick. The bond coat and mastic shall be evaluated for compatibility and shall bond firmly together.

**1405.12.4 Installation at sidewalk level.** Where glass extends to a sidewalk surface, each section shall rest in an approved metal molding, and be set at least  $\frac{1}{4}$  inch (6.4 mm) above the highest point of the sidewalk. The space between the molding and the sidewalk shall be thoroughly caulked and made water tight.

**1405.12.4.1 Installation above sidewalk level.** Where thin exterior structural glass veneer is installed above the level of the top of a bulkhead facing, or at a level more than 36 inches (914 mm) above the sidewalk level, the mastic cement binding shall be supplemented with approved nonferrous metal shelf angles located in the horizontal joints in every course. Such shelf angles shall be not less than 0.0478-inch (1.2 mm) thick and not less than 2 inches (51 mm) long and shall be spaced at approved intervals, with not less than two angles for each glass unit. Shelf angles shall be secured to the wall or backing with expansion bolts, toggle bolts or by other approved methods.

**1405.12.5 Joints.** Unless otherwise specifically approved by the building official, abutting edges of thin exterior structural glass veneer shall be ground square. Mitered joints shall not be used except where specifically approved for wide angles. Joints shall be uniformly buttered with an approved jointing compound and horizontal joints shall be held to not less than 0.063 inch (1.6 mm) by an approved nonrigid substance or device. Where thin exterior structural glass veneer abuts nonresilient material at sides or top, expansion joints not less than  $\frac{1}{4}$  inch (6.4 mm) wide shall be provided.

**1405.12.6 Mechanical fastenings.** Thin exterior structural glass veneer installed above the level of the heads of show windows and veneer installed more than 12 feet (3658 mm) above sidewalk level shall, in addition to the mastic cement and shelf angles, be held in place by the use of fastenings at each vertical or horizontal edge, or at the four corners of each glass unit. Fastenings shall be secured to the wall or backing with expansion bolts, toggle bolts or by other methods. Fastenings shall be so designed as to hold the glass veneer in a vertical plane independent of the

mastic cement. Shelf angles providing both support and fastenings shall be permitted.

**1405.12.7 Flashing.** Exposed edges of thin exterior structural glass veneer shall be flashed with overlapping corrosion-resistant metal flashing and caulked with a waterproof compound in a manner to effectively prevent the entrance of moisture between the glass veneer and the backing.

**1405.13 Exterior windows and doors.** Windows and doors installed in exterior walls shall conform to the testing and performance requirements of Section 1710.5.

**1405.13.1 Installation.** Windows and doors shall be installed in accordance with approved manufacturer's instructions. Fastener size and spacing shall be provided in such instructions and shall be calculated based on maximum loads and spacing used in the tests.

**1405.14 Vinyl siding.** Vinyl siding conforming to the requirements of this section and complying with ASTM D 3679 shall be permitted on exterior walls of buildings located in areas where  $V_{asd}$  as determined in accordance with Section 1609.3.1 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where  $V_{asd}$  as determined in accordance with Section 1609.3.1 exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

**1405.14.1 Application.** The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the water-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and  $\frac{1}{8}$ -inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least  $\frac{3}{4}$  inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

**1405.15 Cement plaster.** Cement plaster applied to exterior walls shall conform to the requirements specified in Chapter 25.

**1405.16 Fiber-cement siding.** Fiber-cement siding complying with Section 1404.10 shall be permitted on exterior walls of Type I, II, III, IV and V construction for wind pressure resistance or wind speed exposures as indicated by the manufacturer's listing and label and approved installation instructions. Where specified, the siding shall be installed over sheathing or materials listed in Section 2304.6 and shall be

installed to conform to the water-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding to wood studs shall be corrosion-resistant round head smooth shank and shall be long enough to penetrate the studs at least 1 inch (25 mm). For metal framing, all-weather screws shall be used and shall penetrate the metal framing at least three full threads.

**1405.16.1 Panel siding.** Fiber-cement panels shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be sealed with caulking, covered with battens or shall be designed to comply with Section 1403.2. Panel siding shall be installed with fasteners in accordance with the approved manufacturer's instructions.

**1405.16.2 Lap siding.** Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Lap siding shall be lapped a minimum of  $1\frac{1}{4}$  inches (32 mm) and lap siding not having tongue-and-groove end joints shall have the ends sealed with caulking, covered with an H-section joint cover, located over a strip of flashing or shall be designed to comply with Section 1403.2. Lap siding courses shall be installed with the fastener heads exposed or concealed in accordance with the approved manufacturer's instructions.

**1405.17 Fastening.** Weather boarding and wall coverings shall be securely fastened with aluminum, copper, zinc, zinc-coated or other approved corrosion-resistant fasteners in accordance with the nailing schedule in Table 2304.9.1 or the approved manufacturer's installation instructions. Shingles and other weather coverings shall be attached with appropriate standard-shingle nails to furring strips securely nailed to studs, or with approved mechanically bonding nails, except where sheathing is of wood not less than 1-inch (25 mm) nominal thickness or of wood structural panels as specified in Table 2308.9.3(3).

**1405.18 Polypropylene siding.** Polypropylene siding conforming to the requirements of this section and complying with Section 1404.12 shall be limited to exterior walls of Type VB construction located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

**SECTION 1406**  
**COMBUSTIBLE MATERIALS**  
**ON THE EXTERIOR SIDE OF EXTERIOR WALLS**

**1406.1 General.** Section 1406 shall apply to exterior wall coverings; balconies and similar projections; and bay and oriel windows constructed of combustible materials.

**1406.2 Combustible exterior wall coverings.** Combustible exterior wall coverings shall comply with this section.

**Exception:** Plastics complying with Chapter 26.

**1406.2.1 Type I, II, III and IV construction.** On buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of combustible materials, complying with the following limitations:

1. Combustible exterior wall coverings shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less.
2. Combustible exterior wall coverings shall be limited to 40 feet (12 192 mm) in height above grade plane.
3. Combustible exterior wall coverings constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above grade plane regardless of the fire separation distance.
4. Wood veneers shall comply with Section 1405.5.

**1406.2.1.1 Ignition resistance.** Where permitted by Section 1406.2.1, combustible exterior wall coverings shall be tested in accordance with NFPA 268.

**Exceptions:**

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior covering other than vinyl sidings listed in Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48 mm).

**1406.2.1.1.1 Fire separation 5 feet or less.** Where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) or less, combustible exterior wall coverings shall not exhibit sustained flaming as defined in NFPA 268.

**1406.2.1.1.2 Fire separation greater than 5 feet.** For fire separation distances greater than 5 feet (1524 mm), any exterior wall covering shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the exterior wall covering shall be determined from Table 1406.2.1.1.2 based on the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the exterior wall covering.

**TABLE 1406.2.1.1.2**  
**MINIMUM FIRE SEPARATION FOR COMBUSTIBLE**  
**EXTERIOR WALL COVERINGS**

FIRE SEPARATION DISTANCE (feet)	TOLERABLE LEVEL INCIDENT RADIANT HEAT ENERGY(kW/m <sup>2</sup> )	FIRE SEPARATION DISTANCE (feet)	TOLERABLE LEVEL INCIDENT RADIANT HEAT ENERGY(kW/m <sup>2</sup> )
5	12.5	16	5.9
6	11.8	17	5.5
7	11.0	18	5.2
8	10.3	19	4.9
9	9.6	20	4.6
10	8.9	21	4.4
11	8.3	22	4.1
12	7.7	23	3.9
13	7.2	24	3.7
14	6.7	25	3.5
15	6.3		

For SI: 1 foot = 304.8 mm, 1 Btu/H<sup>2</sup> × °F = 0.0057 kW/m<sup>2</sup> × K.

**1406.2.2 Location.** Combustible exterior wall coverings located along the top of exterior walls shall be completely backed up by the exterior wall and shall not extend over or above the top of the exterior wall.

**1406.2.3 Fireblocking.** Where the combustible exterior wall covering is furred out from the exterior wall and forms a solid surface, the distance between the back of the exterior wall covering and the exterior wall shall not exceed 1<sup>5</sup>/<sub>8</sub> inches (41 mm). The concealed space thereby created shall be fireblocked in accordance with Section 718.

**Exception:** The distance between the back of the exterior wall covering and the exterior wall shall be permitted to exceed 1<sup>5</sup>/<sub>8</sub> inches (41 mm) where the concealed space is not required to be fireblocked by Section 718.

**1406.3 Balconies and similar projections.** Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

**Exceptions:**

1. On buildings of Type I and II construction, three stories or less above grade plane, fire-retardant-treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas.

4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

**1406.4 Bay and oriel windows.** Bay and oriel windows shall conform to the type of construction required for the building to which they are attached.

**Exception:** Fire-retardant-treated wood shall be permitted on buildings three stories or less above grade plane of Type I, II, III or IV construction.

## SECTION 1407 METAL COMPOSITE MATERIALS (MCM)

**1407.1 General.** The provisions of this section shall govern the materials, construction and quality of metal composite materials (MCM) for use as exterior wall coverings in addition to other applicable requirements of Chapters 14 and 16.

**1407.1.1 Plastic core.** The plastic core of the MCM shall not contain foam plastic insulation as defined in Section 2602.1.

**1407.2 Exterior wall finish.** MCM used as exterior wall finish or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1407.4 through 1407.14.

**1407.3 Architectural trim and embellishments.** MCM used as architectural trim or embellishments shall comply with Sections 1407.7 through 1407.14.

**1407.4 Structural design.** MCM systems shall be designed and constructed to resist wind loads as required by Chapter 16 for components and cladding.

**1407.5 Approval.** Results of approved tests or an engineering analysis shall be submitted to the building official to verify compliance with the requirements of Chapter 16 for wind loads.

**1407.6 Weather resistance.** MCM systems shall comply with Section 1403 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's installation instructions.

**1407.7 Durability.** MCM systems shall be constructed of approved materials that maintain the performance characteristics required in Section 1407 for the duration of use.

**1407.8 Fire-resistance rating.** Where MCM systems are used on exterior walls required to have a fire-resistance rating in accordance with Section 705, evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

**Exception:** MCM systems not containing foam plastic insulation, which are installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

**1407.9 Surface-burning characteristics.** Unless otherwise specified, MCM shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in

the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.

**1407.10 Type I, II, III and IV construction.** Where installed on buildings of Type I, II, III and IV construction, MCM systems shall comply with Sections 1407.10.1 through 1407.10.4, or Section 1407.11.

**1407.10.1 Surface-burning characteristics.** MCM shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.

**1407.10.2 Thermal barriers.** MCM shall be separated from the interior of a building by an approved thermal barrier consisting of  $\frac{1}{2}$ -inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

**1407.10.3 Thermal barrier not required.** The thermal barrier specified for MCM in Section 1407.10.2 is not required where:

1. The MCM system is specifically approved based on tests conducted in accordance with NFPA 286 and with the acceptance criteria of Section 803.1.2.1, UL 1040 or UL 1715. Such testing shall be performed with the MCM in the maximum thickness intended for use. The MCM system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The MCM is used as elements of balconies and similar projections, architectural trim or embellishments.

**1407.10.4 Full-scale tests.** The MCM system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

**1407.11 Alternate conditions.** MCM and MCM systems shall not be required to comply with Sections 1407.10.1 through 1407.10.4 provided such systems comply with Sections 1407.11.1, 1407.11.2, 1407.11.3, or 1407.11.4.

**1407.11.1 Installations up to 40 feet in height.** MCM shall not be installed more than 40 feet (12 190 mm) in height above grade where installed in accordance with Sections 1407.11.1 and 1407.11.2.

**1407.11.1.1 Fire separation distance of 5 feet or less.** Where the fire separation distance is 5 feet (1524 mm) or less, the area of MCM shall not exceed 10 percent of the exterior wall surface.

**1407.11.1.2 Fire separation distance greater than 5 feet.** Where the fire separation distance is greater than 5 feet (1524 mm), there shall be no limit on the area of exterior wall surface coverage using MCM.

**1407.11.2 Installations up to 50 feet in height.** MCM shall not be installed more than 50 feet (15 240 mm) in

## EXTERIOR WALLS

height above grade where installed in accordance with Sections 1407.11.2.1 and 1407.11.2.2.

**1407.11.2.1 Self-ignition temperature.** MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.

**1407.11.2.2 Limitations.** Sections of MCM shall not exceed 300 square feet ( $27.9 \text{ m}^2$ ) in area and shall be separated by a minimum of 4 feet (1219 mm) vertically.

**1407.11.3 Installations up to 75 feet in height (Option 1).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1407.11.3.1 through 1407.11.3.5.

**Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be exempt from the height limitation.

**1407.11.3.1 Prohibited occupancies.** MCM shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.

**1407.11.3.2 Nonfire-resistance-rated exterior walls.** MCM shall not be permitted on exterior walls required to have a fire-resistance rating by other provisions of this code.

**1407.11.3.3 Specifications.** MCM shall be required to comply with all of the following:

1. MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.
2. MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

Class CC2: Materials that have a burning rate of  $2\frac{1}{2}$  inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

**1407.11.3.4 Area limitation and separation.** The maximum area of a single MCM panel and the minimum vertical and horizontal separation requirements for MCM panels shall be as provided for in Table 1407.11.3.4. The maximum percentage of exterior wall area of any story covered with MCM panels shall not exceed that indicated in Table 1407.11.3.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.

**Exception:** In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the exterior wall in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.

**1407.11.3.5 Automatic sprinkler system increases.** Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum percentage area of exterior wall of any story covered with MCM panels and the maximum square footage of a single area of MCM panels in Table 1407.11.3.4 shall be increased 100 percent. The area of MCM panels shall not exceed 50 percent of the exterior wall area of any story or the area permitted by Section 704.8 for unprotected openings, whichever is smaller.

**1407.11.4 Installations up to 75 feet in height (Option 2).**

MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1407.11.4.1 through 1407.11.4.4.

**Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be exempt from the height limitation.

**TABLE 1407.11.3.4  
AREA LIMITATION AND SEPARATION REQUIREMENTS FOR MCM PANELS**

FIRE SEPARATION DISTANCE (feet)	COMBUSTIBILITY CLASS OF MCM	MAXIMUM PERCENTAGE AREA OF EXTERIOR WALL COVERED WITH MCM PANELS	MAXIMUM SINGLE AREA OF MCM PANELS (square feet)	MINIMUM SEPARATION OF MCM PANELS (feet)	
				Vertical	Horizontal
Less than 6	—	Not Permitted	Not Permitted	—	—
6 or more but less than 11	CC1	10	50	8	4
	CC2	Not Permitted	Not Permitted	—	—
11 or more but less than or equal to 30	CC1	25	90	6	4
	CC2	15	70	8	4
More than 30	CC1	50	Not Permitted	3 <sup>a</sup>	0
	CC2	50	100	6 <sup>a</sup>	3

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

a. For reductions in the minimum vertical separation, see Section 1407.11.3.4.

**1407.11.4.1 Minimum fire separation distance.** MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).

**Exception:** Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).

**1407.11.4.2 Specifications.** MCM shall be required to comply with all of the following:

1. MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.
2. MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

Class CC2: Materials that have a burning rate of  $2\frac{1}{2}$  inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

**1407.11.4.3 Area and size limitations.** The aggregate area of MCM panels shall not exceed 25 percent of the area of any exterior wall face of the story on which it is installed. The area of a single MCM panel installed above the first story above grade plane shall not exceed 16 square feet ( $1.5 \text{ m}^2$ ) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).

**Exception:** Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the exterior wall face of the story on which it is installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.

**1407.11.4.4 Vertical separations.** Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the exterior wall or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the exterior walls at one story intervals.

**Exception:** Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**1407.12 Type V construction.** MCM shall be permitted to be installed on buildings of Type V construction.

**1407.13 Foam plastic insulation.** MCM systems containing foam plastic insulation shall also comply with the requirements of Section 2603.

**1407.14 Labeling.** MCM shall be labeled in accordance with Section 1703.5.

## SECTION 1408 EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

**1408.1 General.** The provisions of this section shall govern the materials, construction and quality of exterior insulation and finish systems (EIFS) for use as exterior wall coverings in addition to other applicable requirements of Chapters 7, 14, 16, 17 and 26.

**1408.2 Performance characteristics.** EIFS shall be constructed such that it meets the performance characteristics required in ASTM E 2568.

**1408.3 Structural design.** The underlying structural framing and substrate shall be designed and constructed to resist loads as required by Chapter 16.

**1408.4 Weather resistance.** EIFS shall comply with Section 1403 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's application instructions.

**1408.4.1 EIFS with drainage.** EIFS with drainage shall have an average minimum drainage efficiency of 90 percent when tested in accordance the requirements of ASTM E 2273 and is required on framed walls of Type V construction, Group R1, R2, R3 and R4 occupancies.

**1408.4.1.1 Water-resistive barrier.** For EIFS with drainage, the water-resistive barrier shall comply with Section 1404.2 or ASTM E 2570.

**1408.5 Installation.** Installation of the EIFS and EIFS with drainage shall be in accordance with the EIFS manufacturer's instructions.

**1408.6 Special inspections.** EIFS installations shall comply with the provisions of Sections 1704.2 and 1705.15.

## SECTION 1409 HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATES (HPL)

**1409.1 General.** The provisions of this section shall govern the materials, construction and quality of High-Pressure Decorative Exterior-Grade Compact Laminates (HPL) for use as exterior wall coverings in addition to other applicable requirements of Chapters 14 and 16.

**1409.2 Exterior wall finish.** HPL used as exterior wall covering or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1409.4 and 1409.14.

**1409.3 Architectural trim and embellishments.** HPL used as architectural trim or embellishments shall comply with Sections 1409.7 through 1409.14.

**1409.4 Structural design.** HPL systems shall be designed and constructed to resist wind loads as required by Chapter 16 for components and cladding.

**1409.5 Approval.** Results of approved tests or an engineering analysis shall be submitted to the building official to verify compliance with the requirements of Chapter 16 for wind loads.

**1409.6 Weather resistance.** HPL systems shall comply with Section 1403 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's installation instructions.

**1409.7 Durability.** HPL systems shall be constructed of approved materials that maintain the performance characteristics required in Section 1409 for the duration of use.

**1409.8 Fire-resistance rating.** Where HPL systems are used on exterior walls required to have a fire-resistance rating in accordance with Section 705, evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

**Exception:** HPL systems not containing foam plastic insulation, which are installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

**1409.9 Surface-burning characteristics.** Unless otherwise specified, HPL shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in the minimum and maximum thicknesses intended for use in accordance with ASTM E 84 or UL 723.

**1409.10 Type I, II, III and IV construction.** Where installed on buildings of Type I, II, III and IV construction, HPL systems shall comply with Sections 1409.10.1 through 1409.10.4, or Section 1409.11.

**1409.10.1 Surface-burning characteristics.** HPL shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in the minimum and maximum thicknesses intended for use in accordance with ASTM E 84 or UL 723.

**1409.10.2 Thermal barriers.** HPL shall be separated from the interior of a building by an approved thermal barrier consisting of  $\frac{1}{2}$ -inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance with UL 1715.

**1409.10.3 Thermal barrier not required.** The thermal barrier specified for HPL in Section 1409.10.2 is not required where:

1. The HPL system is specifically approved based on tests conducted in accordance with UL 1040 or UL 1715. Such testing shall be performed with the HPL in the minimum and maximum thicknesses intended for use. The HPL system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The HPL is used as elements of balconies and similar projections, architectural trim or embellishments.

**1409.10.4 Full-scale tests.** The HPL system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on the HPL system with the HPL in the minimum and maximum thicknesses intended for use.

**1409.11 Alternate conditions.** HPL and HPL systems shall not be required to comply with Sections 1409.10.1 through 1409.10.4 provided such systems comply with Section 1409.11.1 or 1409.11.2.

**1409.11.1 Installations up to 40 feet in height.** HPL shall not be installed more than 40 feet (12 190 mm) in height above grade plane where installed in accordance with Sections 1409.11.1.1 and 1409.11.1.2.

**1409.11.1.1 Fire separation distance of 5 feet or less.** Where the fire separation distance is 5 feet (1524 mm) or less, the area of HPL shall not exceed 10 percent of the exterior wall surface.

**1409.11.1.2 Fire separation distance greater than 5 feet.** Where the fire separation distance is greater than 5 feet (1524 mm), there shall be no limit on the area of exterior wall surface coverage using HPL.

**1409.11.2 Installations up to 50 feet in height.** HPL shall not be installed more than 50 feet (15 240 mm) in height above grade plane where installed in accordance with Sections 1409.11.2.1 and 1409.11.2.2.

**1409.11.2.1 Self-ignition temperature.** HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.

**1409.11.2.2 Limitations.** Sections of HPL shall not exceed 300 square feet ( $27.9\text{ m}^2$ ) in area and shall be separated by a minimum 4 feet (1219 mm) vertically.

**1409.12 Type V construction.** HPL shall be permitted to be installed on buildings of Type V construction.

**1409.13 Foam plastic insulation.** HPL systems containing foam plastic insulation shall also comply with the requirements of Section 2603.

**1409.14 Labeling.** HPL shall be labeled in accordance with Section 1703.5.

## SECTION 1410 [DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4]

### ADDITIONAL REQUIREMENTS FOR ANCHORED AND ADHERED VENEER

**1410.1 General.** In no case shall veneer be considered as part of the backing in computing strength or deflection nor shall it be considered a part of the required thickness of the backing.

Veneer shall be anchored in a manner which will not allow relative movement between the veneer and the wall.

Anchored or adhered veneer shall not be used on overhead horizontal surfaces.

**1410.2 Adhered veneer.** Units of tile, masonry, stone or terra cotta which exceed  $\frac{5}{8}$  inch (16 mm) in thickness shall be applied as for anchored veneer where used over exit ways or

more than 20 feet (6096 mm) in height above adjacent ground elevation.

**1410.2.1 Bond strength and tests.** Veneer shall develop a bond to the backing in accordance with TMS 402, Section 6.3.2.4.

Not less than two shear tests shall be performed for the adhered veneer between the units and the supporting element. At least one shear test shall be performed at each building for each 5,000 square feet ( $465\text{ m}^2$ ) of floor area or fraction thereof.



**CALIFORNIA BUILDING CODE – MATRIX ADOPTION TABLE**  
**CHAPTER 15 – ROOF ASSEMBLIES AND ROOFTOP STRUCTURES**

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.

See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter							X	X	X	X		X								
Adopt entire chapter as amended (amended sections listed below)	X																			
Adopt only those sections that are listed below		X																		
Chapter / Section																				
1501			X																	
1502			X																	
1505			X																	
Table 1505.1			X																	
1505.8			X																	
1505.9			X																	
1506			X																	
1507			X																	
1507.3.10							X	X	X	X		X								
1507.7.8							X	X	X	X		X								
1509			X																	
1509.7.1 Exception	X		X	X			X	X												
1509.7.2			X																	
1511			X																	
1511.1			X																	
1511.1.1			X																	
1512									X	X	X	X		X						

*The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 111.*



## CHAPTER 15

# ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

### SECTION 1501 GENERAL

**1501.1 Scope.** The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies, and rooftop structures.

### SECTION 1502 DEFINITIONS

**1502.1 Definitions.** The following terms are defined in Chapter 2:

**AGGREGATE.**

**BALLAST.**

**BUILT-UP ROOF COVERING.**

**INTERLAYMENT.**

**MECHANICAL EQUIPMENT SCREEN.**

**METAL ROOF PANEL.**

**METAL ROOF SHINGLE.**

**MODIFIED BITUMEN ROOF COVERING.**

**PENTHOUSE.**

**PHOTOVOLTAIC MODULES/SHINGLES.**

**POSITIVE ROOF DRAINAGE.**

**REROOFING.**

**ROOF ASSEMBLY.**

**ROOF COVERING.**

**ROOF COVERING SYSTEM.**

**ROOF DECK.**

**ROOF RECOVER.**

**ROOF REPAIR.**

**ROOF REPLACEMENT.**

**ROOF VENTILATION.**

**ROOFTOP STRUCTURE.**

**SCUPPER.**

**SINGLE-PLY MEMBRANE.**

**UNDERLAYMENT.**

### SECTION 1503 WEATHER PROTECTION

**1503.1 General.** Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof coverings shall be designed and installed in accordance with this code and the approved manufacturer's instructions such that the roof covering shall serve to protect the building or structure.

**1503.2 Flashing.** Flashing shall be installed in such a manner so as to prevent moisture entering the wall and roof through joints in copings, through moisture-permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

**1503.2.1 Locations.** Flashing shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.483 mm) (No. 26 galvanized sheet).

**1503.3 Coping.** Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width no less than the thickness of the parapet wall.

**[P] 1503.4 Roof drainage.** Design and installation of roof drainage systems shall comply with Section 1503 of this code and *Chapter 11* of the *California Plumbing Code*.

**[P] 1503.4.1 Secondary (emergency overflow) drains or scuppers.** Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. The installation and sizing of secondary emergency overflow drains, leaders and conductors shall comply with *Chapter 11* of the *California Plumbing Code*.

**1503.4.2 Scuppers.** When scuppers are used for secondary (emergency overflow) roof drainage, the quantity, size, location and inlet elevation of the scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1611.1. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when locating and sizing scuppers.

**1503.4.3 Gutters.** Gutters and leaders placed on the outside of buildings, other than Group R-3, private garages and buildings of Type V construction, shall be of noncombustible material or a minimum of Schedule 40 plastic pipe.

**1503.5 Roof ventilation.** Intake and exhaust vents shall be provided in accordance with Section 1203.2 and the manufacturer's installation instructions.

**1503.6 Crickets and saddles.** A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

**Exception:** Unit skylights installed in accordance with Section 2405.5 and flashed in accordance with the man-

facturer's instructions shall be permitted to be installed without a cricket or saddle.

## SECTION 1504 PERFORMANCE REQUIREMENTS

**1504.1 Wind resistance of roofs.** Roof decks and roof coverings shall be designed for wind loads in accordance with Chapter 16 and Sections 1504.2, 1504.3 and 1504.4.

**1504.1.1 Wind resistance of asphalt shingles.** Asphalt shingles shall comply with Section 1507.2.7.

**1504.2 Wind resistance of clay and concrete tile.** Wind loads on clay and concrete tile roof coverings shall be in accordance with Section 1609.5.

**1504.3 Wind resistance of nonballasted roofs.** Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.

**1504.3.1 Other roof systems.** Roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply through fastened metal panel roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4474, UL 580 or UL 1897.

**1504.3.2 Metal panel roof systems.** Metal panel roof systems through fastened or standing seam shall be tested in accordance with UL 580 or ASTM E 1592.

**Exception:** Metal roofs constructed of cold-formed steel, where the roof deck acts as the roof covering and provides both weather protection and support for structural loads, shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2210.1.

**1504.4 Ballasted low-slope roof systems.** Ballasted low-slope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4.

**1504.5 Edge securement for low-slope roofs.** Low-slope built-up, modified bitumen and single-ply roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except  $V_{asd}$  wind speed shall be determined from Figure 1609A, 1609B, or 1609C as applicable.

**1504.6 Physical properties.** Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154. Those roof coverings that are subject to cyclical flexural response due to wind loads shall not demonstrate any significant loss of ten-

sile strength for unreinforced membranes or breaking strength for reinforced membranes when tested as herein required.

**1504.7 Impact resistance.** Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

**1504.8 Aggregate.** Aggregate used as surfacing for roof coverings and aggregate, gravel or stone used as ballast shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 202, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the site.

**TABLE 1504.8  
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED  
FOR BUILDINGS WITH AGGREGATE ON THE ROOF IN  
AREAS OUTSIDE A HURRICANE-PRONE REGION**

NOMINAL DESIGN WIND SPEED, $V_{asd}$ (mph) <sup>b, d</sup>	MAXIMUM MEAN ROOF HEIGHT (ft) <sup>a, c</sup>		
	Exposure category		
	B	C	D
85	170	60	30
90	110	35	15
95	75	20	NP
100	55	15	NP
105	40	NP	NP
110	30	NP	NP
115	20	NP	NP
120	15	NP	NP
Greater than 120	NP	NP	NP

For SI: 1 foot = 304.8 mm; 1 mile per hour = 0.447 m/s.

a. Mean roof height as defined in ASCE 7.

b. For intermediate values of  $V_{asd}$ , the height associated with the next higher value of  $V_{asd}$  shall be used, or direct interpolation is permitted.

c. NP = gravel and stone not permitted for any roof height.

d.  $V_{asd}$  shall be determined in accordance with Section 1609.3.1.

## SECTION 1505 FIRE CLASSIFICATION

**1505.1 General.** Roof assemblies shall be divided into the classes defined below. Class A, B and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790. In addition, fire-retardant-treated wood roof coverings shall be tested in accordance with ASTM D 2898. The minimum roof coverings installed on buildings shall comply with Table 1505.1 based on the type of construction of the building.

**Exception:** Skylights and sloped glazing that comply with Chapter 24 or Section 2610.

**TABLE 1505.1<sup>a</sup>**  
**MINIMUM ROOF COVERING**  
**CLASSIFICATION FOR TYPES OF CONSTRUCTION**

IA	IB	IIA	IIB	III A	III B	IV	V A	V B
B	B	B	C	B	C	B	B	C

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

a. Unless otherwise required in accordance with Chapter 7A.

**1505.1.1 Roof coverings within very high fire hazard severity zones.** The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class A.

**Exception:** The requirements shall not apply in any jurisdiction that adopts the model ordinance approved by the State Fire Marshal pursuant to Section 51189 of the Government Code or an ordinance that substantially conforms to the model ordinance and transmits a copy to the State Fire Marshal.

**1505.1.2 Roof coverings within state responsibility areas.** The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure shall be a fire-retardant roof covering that is at least Class B.

**Exception:** Areas designated as moderate fire hazard severity zones.

**1505.1.3 Roof coverings within all other areas.** The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class C.

**1505.1.4 Roofing requirements in a Wildland-Urban Interface Fire Area.** Roofing requirements for structures located in a Wildland-Urban Interface Fire Area shall also comply with Section 705A.

**1505.2 Class A roof assemblies.** Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by an approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

#### Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles,

clay or concrete roof tile or slate installed on non-combustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.

3. Class A roof assemblies include minimum 16 oz/sq. ft. (0.0416 kg/m<sup>2</sup>) copper sheets installed over combustible decks.

**1505.3 Class B roof assemblies.** Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.

**1505.4 Class C roof assemblies.** Class C roof assemblies are those that are effective against light fire-test exposure. Class C roof assemblies and roof coverings shall be listed and identified as Class C by an approved testing agency.

**1505.5 Nonclassified roofing.** Nonclassified roofing is approved material that is not listed as a Class A, B or C roof covering.

**1505.6 Fire-retardant-treated wood shingles and shakes.** Fire-retardant-treated wood shakes and shingles are wood shales and shingles complying with UBC Standard 15-3 or 15-4 which are impregnated by the full-cell vacuum-pressure process with fire-retardant chemicals, and which have been qualified by UBC Standard 15-2 for use on Class A, B or C roofs.

*Fire-retardant-treated wood shales and shingles shall comply with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7(j). Each bundle shall bear labels from an ICC accredited quality control agency identifying their roof-covering classification and indicating their compliance with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7(j).*

*Health and Safety Code Section 13132.7(j). No wood roof covering materials shall be sold or applied in this state unless both of the following conditions are met:*

- (1) *The materials have been approved and listed by the State Fire Marshal as complying with the requirements of this section.*
- (2) *The materials have passed at least five years of the 10-year natural weathering test. The 10-year natural weathering test required by this subdivision shall be conducted in accordance with standard 15-2 of the 1994 edition of the Uniform Building Code at a testing facility recognized by the State Fire Marshal.*

**1505.7 Special purpose roofs.** Special purpose wood shingle or wood shake roofing shall conform with the grading and application requirements of Section 1507.8 or 1507.9. In addition, an underlayment of  $\frac{5}{8}$ -inch (15.9 mm) Type X water-resistant gypsum backing board or gypsum sheathing shall be placed under minimum nominal  $\frac{1}{2}$ -inch-thick (12.7 mm) wood structural panel solid sheathing or 1-inch (25 mm) nominal spaced sheathing.

**1505.8 Building integrated photovoltaic systems.** Rooftop installed building integrated photovoltaic systems that serve

as the roof covering shall be *listed and labeled for fire classification* in accordance with Section 1505.1.

**1505.9 Photovoltaic panels and modules.** Effective January 1, 2015. Rooftop mounted photovoltaic systems shall be tested, listed and identified with a fire classification in accordance with UL 1703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.

## SECTION 1506 MATERIALS

**1506.1 Scope.** The requirements set forth in this section shall apply to the application of roof-covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the manufacturer's installation instructions. Installation of roof coverings shall comply with the applicable provisions of Section 1507.

**1506.2 Compatibility of materials.** Roofs and roof coverings shall be of materials that are compatible with each other and with the building or structure to which the materials are applied.

**1506.3 Material specifications and physical characteristics.** Roof-covering materials shall conform to the applicable standards listed in this chapter. In the absence of applicable standards or where materials are of questionable suitability, testing by an approved agency shall be required by the building code official to determine the character, quality and limitations of application of the materials.

**1506.4 Product identification.** Roof-covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with Section 1505. Bulk shipments of materials shall be accompanied with the same information issued in the form of a certificate or on a bill of lading by the manufacturer.

## SECTION 1507 REQUIREMENTS FOR ROOF COVERINGS

**1507.1 Scope.** Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions.

**1507.2 Asphalt shingles.** The installation of asphalt shingles shall comply with the provisions of this section.

**1507.2.1 Deck requirements.** Asphalt shingles shall be fastened to solidly sheathed decks.

**1507.2.2 Slope.** Asphalt shingles shall only be used on roof slopes of two units vertical in 12 units horizontal (17-percent slope) or greater. For roof slopes from two units vertical in 12 units horizontal (17-percent slope) up to four units vertical in 12 units horizontal (33-percent slope), double underlayment application is required in accordance with Section 1507.2.8.

**1507.2.3 Underlayment.** Unless otherwise noted, required underlayment shall conform to ASTM D 226, Type I, ASTM D 4869, Type I, or ASTM D 6757.

**1507.2.4 Self-adhering polymer modified bitumen sheet.** Self-adhering polymer modified bitumen sheet shall comply with ASTM D 1970.

**1507.2.5 Asphalt shingles.** Asphalt shingles shall comply with ASTM D 225 or ASTM D 3462.

**1507.2.6 Fasteners.** Fasteners for asphalt shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 12 gage [0.105 inch (2.67 mm)] shank with a minimum  $\frac{3}{8}$  inch-diameter (9.5 mm) head, of a length to penetrate through the roofing materials and a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than  $\frac{3}{4}$  inch (19.1 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F 1667.

**1507.2.7 Attachment.** Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12), shingles shall be installed as required by the manufacturer.

**1507.2.7.1 Wind resistance.** Asphalt shingles shall be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table 1507.2.7.1(1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1507.2.7.1(1).

**Exception:** Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table 1507.2.7.1(2).

TABLE 1507.2.7.1(1)  
CLASSIFICATION OF ASPHALT  
ROOF SHINGLES PER ASTM D 7158<sup>a</sup>

NOMINAL DESIGN WIND SPEED, $V_{asd}^b$ (mph)	CLASSIFICATION REQUIREMENT
85	D, G or H
90	D, G or H
100	G or H
110	G or H
120	G or H
130	H
140	H
150	H

For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.

a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

b.  $V_{asd}$  shall be determined in accordance with Section 1609.3.1.

**TABLE 1507.2.7.1(2)**  
**CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161**

NOMINAL DESIGN WIND SPEED, $V_{asd}$ <sup>a</sup> (mph)	CLASSIFICATION REQUIREMENT
85	A, D or F
90	A, D or F
100	A, D or F
110	F
120	F
130	F
140	F
150	F

For SI: 1 mph = 0.447 m/s.

a.  $V_{asd}$  shall be determined in accordance with Section 1609.3.1.

**1507.2.8 Underlayment application.** For roof slopes from two units vertical in 12 units horizontal (17-percent slope) and up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide (483 mm) strip of underlayment felt parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment overlapping successive sheets 19 inches (483 mm), by fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal.

**1507.2.8.1 High wind attachment.** Underlayment applied in areas subject to high winds [ $V_{asd}$  greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof

sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.2.8.2 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.2.9 Flashings.** Flashing for asphalt shingles shall comply with this section. Flashing shall be applied in accordance with this section and the asphalt shingle manufacturer's printed instructions.

**1507.2.9.1 Base and cap flashing.** Base and cap flashing shall be installed in accordance with the manufacturer's instructions. Base flashing shall be of either corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness or mineral-surfaced roll roofing weighing a minimum of 77 pounds per 100 square feet ( $3.76 \text{ kg/m}^2$ ). Cap flashing shall be corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness.

**1507.2.9.2 Valleys.** Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 24 inches (610 mm) wide and of any of the corrosion-resistant metals in Table 1507.2.9.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380, and at least 36 inches (914 mm) wide or types as described in Item 1 or 2 above shall be permitted. Self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 shall be permitted in lieu of the lining material.

**1507.2.9.3 Drip edge.** Provide drip edge at eaves and gables of shingle roofs. Overlap to be a minimum of 2 inches (51 mm). Eave drip edges shall extend  $\frac{1}{4}$  inch (6.4 mm) below sheathing and extend back on the roof a minimum of 2 inches (51 mm). Drip edge shall be mechanically fastened a maximum of 12 inches (305 mm) o.c.

**TABLE 1507.2.9.2  
VALLEY LINING MATERIAL**

MATERIAL	MINIMUM THICKNESS	GAGE	WEIGHT
Aluminum	0.024 in.	—	—
Cold-rolled copper	0.0216 in.	—	ASTM B 370, 16 oz. per square ft.
Copper	—	—	16 oz
Galvanized steel	0.0179 in.	26 (zinc-coated G90)	—
High-yield copper	0.0162 in.	—	ASTM B 370, 12 oz. per square ft.
Lead	—	—	2.5 pounds
Lead-coated copper	0.0216 in.	—	ASTM B 101, 16 oz. per square ft.
Lead-coated high-yield copper	0.0162 in.	—	ASTM B 101, 12 oz. per square ft.
Painted terne	—	—	20 pounds
Stainless steel	—	28	—
Zinc alloy	0.027 in.	—	—

For SI: 1 inch = 25.4 mm, 1 pound = 0.454 kg, 1 ounce = 28.35 g, 1 square foot = 0.093 m<sup>2</sup>.

**1507.3 Clay and concrete tile.** The installation of clay and concrete tile shall comply with the provisions of this section.

**1507.3.1 Deck requirements.** Concrete and clay tile shall be installed only over solid sheathing or spaced structural sheathing boards.

**1507.3.2 Deck slope.** Clay and concrete roof tile shall be installed on roof slopes of  $2\frac{1}{2}$  units vertical in 12 units horizontal (21-percent slope) or greater. For roof slopes from  $2\frac{1}{2}$  units vertical in 12 units horizontal (21-percent slope) to four units vertical in 12 units horizontal (33-percent slope), double underlayment application is required in accordance with Section 1507.3.3.

**1507.3.3 Underlayment.** Unless otherwise noted, required underlayment shall conform to: ASTM D 226, Type II; ASTM D 2626 or ASTM D 6380, Class M mineral-surfaced roll roofing.

**1507.3.3.1 Low-slope roofs.** For roof slopes from  $2\frac{1}{2}$  units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be a minimum of two layers applied as follows:

- Starting at the eave, a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave and fastened sufficiently in place.
- Starting at the eave, 36-inch-wide (914 mm) strips of underlayment felt shall be applied overlapping successive sheets 19 inches (483 mm) and fastened sufficiently in place.

**1507.3.3.2 High-slope roofs.** For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be a minimum of one layer of underlayment felt applied shingle fashion, parallel to, and starting from the eaves and lapped 2 inches (51 mm), fastened only as necessary to hold in place.

**1507.3.3.3 High wind attachment.** Underlayment applied in areas subject to high wind [ $V_{asd}$  greater than 110 mph (49 m/s) as determined in accordance with

Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.3.4 Clay tile.** Clay roof tile shall comply with ASTM C 1167.

**1507.3.5 Concrete tile.** Concrete roof tile shall comply with ASTM C 1492.

**1507.3.6 Fasteners.** Tile fasteners shall be corrosion resistant and not less than 11 gage,  $\frac{5}{16}$ -inch (8.0 mm) head, and of sufficient length to penetrate the deck a minimum of  $\frac{3}{4}$  inch (19.1 mm) or through the thickness of the deck, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2.1 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

**1507.3.7 Attachment.** Clay and concrete roof tiles shall be fastened in accordance with Table 1507.3.7.

**TABLE 1507.3.7**  
**CLAY AND CONCRETE TILE ATTACHMENT<sup>a, b, c</sup>**

GENERAL - CLAY OR CONCRETE ROOF TILE				
Maximum Nominal Design Wind Speed, $V_{asd}$ '(mph)	Mean roof height (feet)	Roof slope < 3:12	Roof slope 3:12 and over	
85	0-60	One fastener per tile. Flat tile without vertical laps, two fasteners per tile.	Two fasteners per tile. Only one fastener on slopes of 7:12 and less for tiles with installed weight exceeding 7.5 lbs./sq. ft. having a width no greater than 16 inches.	
100	0-40			
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic.		
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.3.		
<b>INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS<sup>d, e</sup></b> (Installations on spaced/solid sheathing with battens or spaced sheathing)				
Maximum Nominal Design Wind Speed, $V_{asd}$ '(mph)	Mean roof height (feet)	Roof slope < 5:12	Roof slope 5:12 < 12:12	Roof slope 12:12 and over
85	0-60	Fasteners are not required. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.	One fastener per tile every other row. All perimeter tiles require one fastener. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.	One fastener required for every tile. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.
100	0-40			
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic.		
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.3.		
<b>INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS</b> (Installations on solid sheathing without battens)				
Maximum Nominal Design Wind Speed, $V_{asd}$ '(mph)	Mean roof height (feet)	All roof slopes		
85	0-60	One fastener per tile.		
100	0-40	One fastener per tile.		
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic.		
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.3.		
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.3.		

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s, 1 pound per square foot = 4.882 kg/m<sup>2</sup>.

- a. Minimum fastener size. Corrosion resistant nails not less than No. 11 gage with  $\frac{5}{16}$  inch head. Fasteners shall be long enough to penetrate into the sheathing  $\frac{3}{4}$  inch or through the thickness of the sheathing, whichever is less. Attaching wire for clay and concrete tile shall not be smaller than 0.083 inch.
- b. Snow areas. A minimum of two fasteners per tile are required or battens and one fastener.
- c. Roof slopes greater than 24:12. The nose of all tiles shall be securely fastened.
- d. Horizontal battens. Battens shall be not less than 1 inch by 2 inch nominal. Provisions shall be made for drainage by a minimum of  $\frac{1}{8}$  inch riser at each nail or by 4 foot long battens with at least a  $\frac{1}{2}$  inch separation between battens. Horizontal battens are required for slopes over 7:12.
- e. Perimeter fastening areas include three tile courses but not less than 36 inches from either side of hips or ridges and edges of eaves and gable rakes.
- f.  $V_{asd}$  shall be determined in accordance with Section 1609.3.1.

**1507.3.8 Application.** Tile shall be applied according to the manufacturer's installation instructions, based on the following:

1. Climatic conditions.
2. Roof slope.
3. Underlayment system.
4. Type of tile being installed.

**1507.3.9 Flashing.** At the juncture of the roof vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall not be less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley, or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solid cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

**1507.3.10 Additional requirements. [DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4]** In addition to the requirements of 1507.3.6 and 1507.3.7, the installation of clay and concrete tile roof coverings shall comply with seismic anchorage provisions of Section 1512.

**1507.4 Metal roof panels.** The installation of metal roof panels shall comply with the provisions of this section.

**1507.4.1 Deck requirements.** Metal roof panel roof coverings shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced supports.

**1507.4.2 Deck slope.** Minimum slopes for metal roof panels shall comply with the following:

1. The minimum slope for lapped, nonsoldered seam metal roofs without applied lap sealant shall be three units vertical in 12 units horizontal (25-percent slope).
2. The minimum slope for lapped, nonsoldered seam metal roofs with applied lap sealant shall be one-half unit vertical in 12 units horizontal (4-percent slope). Lap sealants shall be applied in accordance with the approved manufacturer's installation instructions.
3. The minimum slope for standing seam of roof systems shall be one-quarter unit vertical in 12 units horizontal (2-percent slope).

**1507.4.3 Material standards.** Metal-sheet roof covering systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet roof coverings installed over structural decking shall comply with Table 1507.4.3(1). The materials used for metal-sheet roof coverings shall be naturally corrosion resistant or provided with corrosion resistance in accordance with the standards and minimum thicknesses shown in Table 1507.4.3(2).

**TABLE 1507.4.3(1)  
METAL ROOF COVERINGS**

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
Aluminum	ASTM B 209, 0.024 inch minimum thickness for roll-formed panels and 0.019 inch minimum thickness for press-formed shingles.
Aluminum-zinc alloy coated steel	ASTM A 792 AZ 50
Cold-rolled copper	ASTM B 370 minimum 16 oz./sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Copper	16 oz./sq. ft. for metal-sheet roof-covering systems; 12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A 653 G-90 zinc-coated <sup>a</sup> .
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B 101
Prepainted steel	ASTM A 755
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A 240, 300 Series Alloys
Steel	ASTM A 924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.0026 kg/m<sup>2</sup>,  
1 pound per square foot = 4.882 kg/m<sup>2</sup>,  
1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A 653 galvanized steel roofing shall be G 60.

**TABLE 1507.4.3(2)  
MINIMUM CORROSION RESISTANCE**

55% Aluminum-zinc alloy coated steel	ASTM A 792 AZ 50
5% Aluminum alloy-coated steel	ASTM A 875 GF60
Aluminum-coated steel	ASTM A 463 T2 65
Galvanized steel	ASTM A 653 G-90
Prepainted steel	ASTM A 755 <sup>a</sup>

a. Paint systems in accordance with ASTM A 755 shall be applied over steel products with corrosion resistant coatings complying with ASTM A 792, ASTM A 875, ASTM A 463 or ASTM A 653.

**1507.4.4 Attachment.** Metal roof panels shall be secured to the supports in accordance with the approved manufacturer's fasteners. In the absence of manufacturer recommendations, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, brass, bronze, copper alloy or 300 series stainless-steel fasteners shall be used for copper roofs.
3. Stainless-steel fasteners are acceptable for all types of metal roofs.

**1507.4.5 Underlayment and high wind.** Underlayment applied in areas subject to high winds [ $V_{asd}$  greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.5 Metal roof shingles.** The installation of metal roof shingles shall comply with the provisions of this section.

**1507.5.1 Deck requirements.** Metal roof shingles shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced sheathing.

**1507.5.2 Deck slope.** Metal roof shingles shall not be installed on roof slopes below three units vertical in 12 units horizontal (25-percent slope).

**1507.5.3 Underlayment.** Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

**1507.5.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [ $V_{asd}$  greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54

m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.5.4 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.5.5 Material standards.** Metal roof shingle roof coverings shall comply with Table 1507.4.3(1). The materials used for metal-roof shingle roof coverings shall be naturally corrosion resistant or provided with corrosion resistance in accordance with the standards and minimum thicknesses specified in the standards listed in Table 1507.4.3(2).

**1507.5.6 Attachment.** Metal roof shingles shall be secured to the roof in accordance with the approved manufacturer's installation instructions.

**1507.5.7 Flashing.** Roof valley flashing shall be of corrosion-resistant metal of the same material as the roof covering or shall comply with the standards in Table 1507.4.3(1). The valley flashing shall extend at least 8 inches (203 mm) from the centerline each way and shall have a splash diverter rib not less than  $\frac{3}{4}$  inch (19.1 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing shall have a 36-inch-wide (914 mm) underlayment directly under it consisting of either one layer of underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to underlayment required for metal roof shingles. The metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for roof slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

**1507.6 Mineral-surfaced roll roofing.** The installation of mineral-surfaced roll roofing shall comply with this section.

**1507.6.1 Deck requirements.** Mineral-surfaced roll roofing shall be fastened to solidly sheathed roofs.

**1507.6.2 Deck slope.** Mineral-surfaced roll roofing shall not be applied on roof slopes below one unit vertical in 12 units horizontal (8-percent slope).

**1507.6.3 Underlayment.** Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

**1507.6.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [Vasd greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where Vasd, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.6.4 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.6.5 Material standards.** Mineral-surfaced roll roofing shall conform to ASTM D 3909 or ASTM D 6380.

**1507.7 Slate shingles.** The installation of slate shingles shall comply with the provisions of this section.

**1507.7.1 Deck requirements.** Slate shingles shall be fastened to solidly sheathed roofs.

**1507.7.2 Deck slope.** Slate shingles shall only be used on slopes of four units vertical in 12 units horizontal (4:12) or greater.

**1507.7.3 Underlayment.** Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

**1507.7.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [Vasd greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.7.4 Ice barrier.** In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.7.5 Material standards.** Slate shingles shall comply with ASTM C 406.

**1507.7.6 Application.** Minimum headlap for slate shingles shall be in accordance with Table 1507.7.6. Slate shingles shall be secured to the roof with two fasteners per slate.

**TABLE 1507.7.6  
SLATE SHINGLE HEADLAP**

SLOPE	HEADLAP (inches)
4:12 < slope < 8:12	4
8:12 < slope < 20:12	3
slope ≥ 20:12	2

For SI: 1 inch = 25.4 mm.

**1507.7.7 Flashing.** Flashing and counterflashing shall be made with sheet metal. Valley flashing shall be a minimum of 15 inches (381 mm) wide. Valley and flashing metal shall be a minimum uncoated thickness of 0.0179-inch (0.455 mm) zinc-coated G90. Chimneys, stucco or brick walls shall have a minimum of two plies of felt for a cap flashing consisting of a 4-inch-wide (102 mm) strip of

felt set in plastic cement and extending 1 inch (25 mm) above the first felt and a top coating of plastic cement. The felt shall extend over the base flashing 2 inches (51 mm).

**1507.7.8 Additional requirements.** [DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4] In addition to the requirements of Sections 1507.7.5, the installation of slate shingle roof coverings shall comply with the requirements of Section 1507.3.6 and 1507.3.7, and the seismic anchorage provisions of Section 1512.

**1507.8 Wood shingles.** The installation of wood shingles shall comply with the provisions of this section and Table 1507.8.

**1507.8.1 Deck requirements.** Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.

**TABLE 1507.8  
WOOD SHINGLE AND SHAKE INSTALLATION**

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
1. Roof slope	Wood shingles shall be installed on slopes of three units vertical in 12 units horizontal (3:12) or greater.	Wood shakes shall be installed on slopes of four units vertical in 12 units horizontal (4:12) or greater.
2. Deck requirement		
Temperate climate	Shingles shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1" x 4" nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners.	Shakes shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1" x 4" nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners. When 1" x 4" spaced sheathing is installed at 10 inches, boards must be installed between the sheathing boards.
In areas where the average daily temperature in January is 25°F or less or where there is a possibility of ice forming along the eaves causing a backup of water.	Solid sheathing required.	Solid sheathing is required.
3. Interlayment	No requirements.	Interlayment shall comply with ASTM D 226, Type 1.
4. Underlayment		
Temperate climate	Underlayment shall comply with ASTM D 226, Type 1.	Underlayment shall comply with ASTM D 226, Type 1.
In areas where there is a possibility of ice forming along the eaves causing a backup of water.	An ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches inside the exterior wall line of the building.	An ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the lowest edges of all roof surfaces to a point at least 24 inches inside the exterior wall line of the building.
5. Application		
Attachment	Fasteners for wood shingles shall be hot-dipped galvanized or Type 304 (Type 316 for coastal areas) stainless steel with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be hot-dipped galvanized or Type 304 (Type 316 for coastal areas) with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not exceed those set forth in Table 1507.8.7.	Weather exposures shall not exceed those set forth in Table 1507.9.8.
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall be 0.25 to 0.375 inch.	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall not be less than 0.375 inch or more than 0.625 inch for shakes and taper sawn shakes of naturally durable wood and shall be 0.25 to 0.375 inch for preservative-treated taper sawn shakes.
Flashing	In accordance with Section 1507.8.8.	In accordance with Section 1507.9.9.

For SI: 1 inch = 25.4 mm, °C = [(°F) - 32]/1.8.

**1507.8.1.1 Solid sheathing required.** Solid sheathing is required in areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water.

**1507.8.2 Deck slope.** Wood shingles shall be installed on slopes of three units vertical in 12 units horizontal (25-percent slope) or greater.

**1507.8.3 Underlayment.** Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

**1507.8.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [V<sub>asd</sub> greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V<sub>asd</sub>, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.8.4 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.8.5 Material standards.** Wood shingles shall be of naturally durable wood and comply with the requirements of Table 1507.8.5.

**TABLE 1507.8.5  
WOOD SHINGLE MATERIAL REQUIREMENTS**

MATERIAL	APPLICABLE MINIMUM GRADES	GRADING RULES
Wood shingles of naturally durable wood	1, 2 or 3	CSSB

CSSB = Cedar Shake and Shingle Bureau

**1507.8.6 Attachment.** Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of  $\frac{3}{4}$  inch (19.1 mm) into the sheathing. For sheathing less than  $\frac{1}{2}$  inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Each shingle shall be attached with a minimum of two fasteners.

**1507.8.7 Application.** Wood shingles shall be laid with a side lap not less than  $1\frac{1}{2}$  inches (38 mm) between joints in adjacent courses, and not be in direct alignment in alternate courses. Spacing between shingles shall be  $\frac{1}{4}$  to  $\frac{3}{8}$  inches (6.4 to 9.5 mm). Weather exposure for wood shingles shall not exceed that set in Table 1507.8.7.

**TABLE 1507.8.7  
WOOD SHINGLE WEATHER EXPOSURE AND ROOF SLOPE**

ROOFING MATERIAL	LENGTH (inches)	GRADE	EXPOSURE (inches)	
			3:12 pitch to < 4:12	4:12 pitch or steeper
Shingles of naturally durable wood	16	No. 1	3.75	5
		No. 2	3.5	4
		No. 3	3	3.5
	18	No. 1	4.25	5.5
		No. 2	4	4.5
		No. 3	3.5	4
	24	No. 1	5.75	7.5
		No. 2	5.5	6.5
		No. 3	5	5.5

For SI: 1 inch = 25.4 mm.

**1507.8.8 Flashing.** At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall not be less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

**1507.9 Wood shakes.** The installation of wood shakes shall comply with the provisions of this section and Table 1507.8.

**1507.9.1 Deck requirements.** Wood shakes shall only be used on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to

coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) o.c., additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards.

**1507.9.1.1 Solid sheathing required.** Solid sheathing is required in areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water.

**1507.9.2 Deck slope.** Wood shakes shall only be used on slopes of four units vertical in 12 units horizontal (33-percent slope) or greater.

**1507.9.3 Underlayment.** Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

**1507.9.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [ $V_{asd}$  greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where  $V_{asd}$ , in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of  $\frac{3}{4}$  inch (19.1 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

**1507.9.4 Ice barrier.** In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of

underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

**Exception:** Detached accessory structures that contain no conditioned floor area.

**1507.9.5 Interlayment.** Interlayment shall comply with ASTM D 226, Type I.

**1507.9.6 Material standards.** Wood shakes shall comply with the requirements of Table 1507.9.6.

TABLE 1507.9.6  
WOOD SHAKE MATERIAL REQUIREMENTS

MATERIAL	MINIMUM GRADES	APPLICABLE GRADING RULES
Wood shakes of naturally durable wood	1	CSSB
Taper sawn shakes of naturally durable wood	1 or 2	CSSB
Preservative-treated shakes and shingles of naturally durable wood	1	CSSB
Fire-retardant-treated shakes and shingles of naturally durable wood	1	CSSB
Preservative-treated taper sawn shakes of Southern pine treated in accordance with AWPA U1 (Commodity Specification A, Use Category 3B and Section 5.6)	1 or 2	TFS

CSSB = Cedar Shake and Shingle Bureau.

TFS = Forest Products Laboratory of the Texas Forest Services.

**1507.9.7 Attachment.** Fasteners for wood shakes shall be corrosion resistant with a minimum penetration of  $\frac{3}{4}$  inch (19.1 mm) into the sheathing. For sheathing less than  $\frac{1}{2}$  inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Each shake shall be attached with a minimum of two fasteners.

**1507.9.8 Application.** Wood shakes shall be laid with a side lap not less than  $1\frac{1}{2}$  inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be  $\frac{3}{8}$  to  $\frac{5}{8}$  inches (9.5 to 15.9 mm) for shakes and taper sawn shakes of naturally durable wood and shall be  $\frac{1}{4}$  to  $\frac{3}{8}$  inch (6.4 to 9.5 mm) for preservative taper sawn shakes. Weather exposure for wood shakes shall not exceed those set in Table 1507.9.8.

TABLE 1507.9.8  
WOOD SHAKE WEATHER EXPOSURE AND ROOF SLOPE

ROOFING MATERIAL	LENGTH (inches)	GRADE	EXPOSURE (inches) 4:12 PITCH OR STEEPER
Shakes of naturally durable wood	18	No. 1	7.5
	24	No. 1	10 <sup>a</sup>
Preservative-treated taper sawn shakes of Southern yellow pine	18	No. 1	7.5
	24	No. 1	10
	18	No. 2	5.5
	24	No. 2	7.5
Taper sawn shakes of naturally durable wood	18	No. 1	7.5
	24	No. 1	10
	18	No. 2	5.5
	24	No. 2	7.5

For SI: 1 inch = 25.4 mm.

a. For 24 inch by 0.375 inch handsplit shakes, the maximum exposure is 7.5 inches.

**TABLE 1507.10.2  
BUILT-UP ROOFING MATERIAL STANDARDS**

MATERIAL STANDARD	STANDARD
Acrylic coatings used in roofing	ASTM D 6083
Aggregate surfacing	ASTM D 1863
Asphalt adhesive used in roofing	ASTM D 3747
Asphalt cements used in roofing	ASTM D 3019; D 2822; D 4586
Asphalt-coated glass fiber base sheet	ASTM D 4601
Asphalt coatings used in roofing	ASTM D 1227; D 2823; D 2824; D 4479
Asphalt glass felt	ASTM D 2178
Asphalt primer used in roofing	ASTM D 41
Asphalt-saturated and asphalt-coated organic felt base sheet	ASTM D 2626
Asphalt-saturated organic felt (perforated)	ASTM D 226
Asphalt used in roofing	ASTM D 312
Coal-tar cements used in roofing	ASTM D 4022; D 5643
Coal-tar saturated organic felt	ASTM D 227
Coal-tar pitch used in roofing	ASTM D 450; Type I or II
Coal-tar primer used in roofing, dampproofing and waterproofing	ASTM D 43
Glass mat, coal tar	ASTM D 4990
Glass mat, venting type	ASTM D 4897
Mineral-surfaced inorganic cap sheet	ASTM D 3909
Thermoplastic fabrics used in roofing	ASTM D 5665, D 5726

**1507.9.9 Flashing.** At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall not be less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

**1507.10 Built-up roofs.** The installation of built-up roofs shall comply with the provisions of this section.

**1507.10.1 Slope.** Built-up roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage, except for coal-tar built-up roofs that shall have a design slope of a minimum one-eighth unit vertical in 12 units horizontal (1-percent slope).

**1507.10.2 Material standards.** Built-up roof covering materials shall comply with the standards in Table 1507.10.2 or UL 55A.

**1507.11 Modified bitumen roofing.** The installation of modified bitumen roofing shall comply with the provisions of this section.

**1507.11.1 Slope.** Modified bitumen membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

**1507.11.2 Material standards.** Modified bitumen roof coverings shall comply with CGSB 37-GP-56M, ASTM D 6162, ASTM D 6163, ASTM D 6164, ASTM D 6222, ASTM D 6223, ASTM D 6298 or ASTM D 6509.

**1507.12 Thermoset single-ply roofing.** The installation of thermoset single-ply roofing shall comply with the provisions of this section.

**1507.12.1 Slope.** Thermoset single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

**1507.12.2 Material standards.** Thermoset single-ply roof coverings shall comply with ASTM D 4637, ASTM D 5019 or CGSB 37-GP-52M.

**1507.12.3 Ballasted thermoset low-slope roofs.** Ballasted thermoset low-slope roofs (roof slope < 2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D 448.

**1507.13 Thermoplastic single-ply roofing.** The installation of thermoplastic single-ply roofing shall comply with the provisions of this section.

**1507.13.1 Slope.** Thermoplastic single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

**1507.13.2 Material standards.** Thermoplastic single-ply roof coverings shall comply with ASTM D 4434, ASTM D 6754, ASTM D 6878 or CGSB CAN/CGSB 37-54.

**1507.13.3 Ballasted thermoplastic low-slope roofs.** Ballasted thermoplastic low-slope roofs (roof slope < 2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D448.

**1507.14 Sprayed polyurethane foam roofing.** The installation of sprayed polyurethane foam roofing shall comply with the provisions of this section.

**1507.14.1 Slope.** Sprayed polyurethane foam roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

**1507.14.2 Material standards.** Spray-applied polyurethane foam insulation shall comply with Type III or IV as defined in ASTM C 1029.

**1507.14.3 Application.** Foamed-in-place roof insulation shall be installed in accordance with the manufacturer's instructions. A liquid-applied protective coating that complies with Table 1507.14.3 shall be applied no less than 2 hours nor more than 72 hours following the application of the foam.

**TABLE 1507.14.3  
PROTECTIVE COATING MATERIAL STANDARDS**

MATERIAL	STANDARD
Acrylic coating	ASTM D 6083
Silicone coating	ASTM D 6694
Moisture-cured polyurethane coating	ASTM D 6947

**1507.14.4 Foam plastics.** Foam plastic materials and installation shall comply with Chapter 26.

**1507.15 Liquid-applied roofing.** The installation of liquid-applied roofing shall comply with the provisions of this section.

**1507.15.1 Slope.** Liquid-applied roofing shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

**1507.15.2 Material standards.** Liquid-applied roofing shall comply with ASTM C 836, ASTM C 957, ASTM D 1227 or ASTM D 3468, ASTM D 6083, ASTM D 6694 or ASTM D 6947.

**1507.16 Roof gardens and landscaped roofs.** Roof gardens and landscaped roofs shall comply with the requirements of this chapter and Sections 1607.12.3 and 1607.12.3.1 and the *California Fire Code*.

**1507.16.1 Structural fire resistance.** The structural frame and roof construction supporting the load imposed upon the roof by the roof gardens or landscaped roofs shall comply with the requirements of Table 601.

**1507.17 Photovoltaic modules/shingles.** The installation of photovoltaic modules/shingles shall comply with the provisions of this section.

**1507.17.1 Material standards.** Photovoltaic modules/shingles shall be listed and labeled in accordance with UL 1703.

**1507.17.2 Attachment.** Photovoltaic modules/shingles shall be attached in accordance with the manufacturer's installation instructions.

**1507.17.3 Wind resistance.** Photovoltaic modules/shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161. Photovoltaic modules/shingles shall comply with the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum nominal design wind speed. Photovoltaic modules/shingle packaging shall bear a label to indicate com-

pliance with the procedures in ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

## SECTION 1508 ROOF INSULATION

**1508.1 General.** The use of above-deck thermal insulation shall be permitted provided such insulation is covered with an approved roof covering and passes the tests of FM 4450 or UL 1256 when tested as an assembly.

### Exceptions:

1. Foam plastic roof insulation shall conform to the material and installation requirements of Chapter 26.
2. Where a concrete roof deck is used and the above-deck thermal insulation is covered with an approved roof covering.

**1508.1.1 Cellulosic fiberboard.** Cellulosic fiberboard roof insulation shall conform to the material and installation requirements of Chapter 23.

**1508.2 Material standards.** Above-deck thermal insulation board shall comply with the standards in Table 1508.2.

**TABLE 1508.2  
MATERIAL STANDARDS FOR ROOF INSULATION**

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene board	ASTM C 578
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or Type II
Wood fiberboard	ASTM C 208

## SECTION 1509 ROOFTOP STRUCTURES

**1509.1 General.** The provisions of this section shall govern the construction of rooftop structures.

**1509.2 Penthouses.** Penthouses in compliance with Sections 1509.2.1 through 1509.2.5 shall be considered as a portion of the story directly below the roof deck on which such penthouses are located. All other penthouses shall be considered as an additional story of the building.

**1509.2.1 Height above roof deck.** Penthouses constructed on buildings other than Type I construction shall not exceed 18 feet (5486 mm) in height above the roof deck as measured to the average height of the roof of the penthouse.

### Exceptions:

1. Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.

2. Penthouses located on the roof of buildings of Type I construction shall not be limited in height.

**1509.2.2 Area limitation.** The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining the building area or number of stories as regulated by Section 503.1. The area of such penthouses shall not be included in determining the fire area specified in Section 901.7.

**1509.2.3 Use limitations.** Penthouses shall not be used for purposes other than the shelter of mechanical or electrical equipment, tanks, or vertical shaft openings in the roof assembly.

**1509.2.4 Weather protection.** Provisions such as louvers, louver blades or flashing shall be made to protect the mechanical and electrical equipment and the building interior from the elements.

**1509.2.5 Type of construction.** Penthouses shall be constructed with walls, floors and roofs as required for the type of construction of the building on which such penthouses are built.

**Exceptions:**

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating.
2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602 and be constructed of fire-retardant-treated wood. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of fire-retardant-treated wood.
3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a fire separation distance of 20 feet (6096

mm) or greater shall be permitted to be of Type IV or noncombustible construction or fire-retardant-treated wood and shall not be required to have a fire-resistance rating.

**1509.3 Tanks.** Tanks having a capacity of more than 500 gallons ( $2 \text{ m}^3$ ) located on the roof deck of a building shall be supported on masonry, reinforced concrete, steel or Type IV construction provided that, where such supports are located in the building above the lowest story, the support shall be fire-resistance rated as required for Type IA construction.

**1509.3.1 Valve and drain.** In the bottom or on the side near the bottom of the tank, a pipe or outlet, fitted with a suitable quick-opening valve for discharging the contents into a drain in an emergency shall be provided.

**1509.3.2 Location.** Tanks shall not be placed over or near a stairway or an elevator shaft, unless there is a solid roof or floor underneath the tank.

**1509.3.3 Tank cover.** Unenclosed roof tanks shall have covers sloping toward the perimeter of the tanks.

**1509.4 Cooling towers.** Cooling towers located on the roof deck of a building and greater than 250 square feet ( $23.2 \text{ m}^2$ ) in base area or greater than 15 feet (4572 mm) in height above the roof deck, as measured to the highest point on the cooling tower, where the roof is greater than 50 feet (15 240 mm) in height above grade plane shall be constructed of non-combustible materials. The base area of cooling towers shall not exceed one-third the area of the supporting roof deck.

**Exception:** Drip boards and the enclosing construction shall be permitted to be of wood not less than 1 inch (25 mm) nominal thickness, provided the wood is covered on the exterior of the tower with noncombustible material.

**1509.5 Towers, spires, domes and cupolas.** Towers, spires, domes and cupolas shall be of a type of construction having fire-resistance ratings not less than required for the building on top of which such tower, spire, dome or cupola is built. Towers, spires, domes and cupolas greater than 85 feet (25 908 mm) in height above grade plane as measured to the highest point on such structures, and either greater than 200 square feet ( $18.6 \text{ m}^2$ ) in horizontal area or used for any purpose other than a belfry or an architectural embellishment, shall be constructed of and supported on Type I or II construction.

**1509.5.1 Noncombustible construction required.** Towers, spires, domes and cupolas greater than 60 feet (18 288 mm) in height above the highest point at which such structure contacts the roof as measured to the highest point on such structure, or that exceeds 200 square feet ( $18.6 \text{ m}^2$ ) in area at any horizontal section, or which is intended to be used for any purpose other than a belfry or architectural embellishment, or is located on the top of a building greater than 50 feet (1524 mm) in building height shall be constructed of and supported by noncombustible materials and shall be separated from the building below by construction having a fire-resistance rating of not less than 1.5 hours with openings protected in accordance with Section 712. Such structures located on the top of a building

greater than 50 feet (15 240 mm) in building height shall be supported by noncombustible construction.

**1509.5.2 Towers and spires.** Enclosed towers and spires shall have exterior walls constructed as required for the building on top of which such towers and spires are built. The roof covering of spires shall not be less than the same class of roof covering required for the building on top of which the spire is located.

**1509.6 Mechanical equipment screens.** Mechanical equipment screens shall be constructed of the materials specified for the exterior walls in accordance with the type of construction of the building. Where the fire separation distance is greater than 5 feet (1524 mm), mechanical equipment screens shall not be required to comply with the fire-resistance rating requirements.

**1509.6.1 Height limitations.** Mechanical equipment screens shall not exceed 18 feet (5486 mm) in height above the roof deck, as measured to the highest point on the mechanical equipment screen.

**Exception:** Where located on buildings of Type IA construction, the height of mechanical equipment screens shall not be limited.

**1509.6.2 Types I, II, III and IV construction.** Regardless of the requirements in Section 1509.6, mechanical equipment screens shall be permitted to be constructed of combustible materials where located on the roof decks of building of Type I, II, III or IV construction in accordance with any one of the following limitations:

1. The fire separation distance shall not be less than 20 feet (6096 mm) and the height of the mechanical equipment screen above the roof deck shall not exceed 4 feet (1219 mm) as measured to the highest point on the mechanical equipment screen.
2. The fire separation distance shall not be less than 20 feet (6096 mm) and the mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation.
3. Where exterior wall covering panels are used, the panels shall have a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use with each face tested independently in accordance with ASTM E 84 or UL 723. The panels shall be tested in the minimum and maximum thicknesses intended for use in accordance with, and shall comply with the acceptance criteria of, NFPA 285 and shall be installed as tested. Where the panels are tested as part of an exterior wall assembly in accordance with NFPA 285, the panels shall be installed on the face of the mechanical equipment screen supporting structure in the same manner as they were installed on the tested exterior wall assembly.

**1509.6.3 Type V construction.** The height of mechanical equipment screens located on the roof decks of buildings of Type V construction, as measured from grade plane to the highest point on the mechanical equipment screen,

shall be permitted to exceed the maximum building height allowed for the building by other provisions of this code where complying with any one of the following limitations, provided the fire separation distance is greater than 5 feet (1524 mm):

1. Where the fire separation distance is not less than 20 feet (6096 mm), the height above grade plane of the mechanical equipment screen shall not exceed 4 feet (1219 mm) more than the maximum building height allowed;
2. The mechanical equipment screen shall be constructed of noncombustible materials;
3. The mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation; or
4. Where the fire separation distance is not less than 20 feet (6096 mm), the mechanical equipment screen shall be constructed of materials having a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use with each face tested independently in accordance with ASTM E 84 or UL 723.

**1509.7 Photovoltaic systems.** Rooftop mounted photovoltaic systems shall be designed in accordance with this section.

**1509.7.1 Wind resistance.** Rooftop mounted photovoltaic systems shall be designed for wind loads for component and cladding in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.

**Exception:** [BSC, HCD-1, HCD-2, DSA-SS, DSA-SS/CCJ] The effective wind area shall be in accordance with Chapter 16 and ASCE 7 Section 26.2.

**1509.7.2 Fire classification.** Rooftop mounted photovoltaic systems shall have the fire classification as required by Section 1505.9.

**1509.7.3 Installation.** Rooftop mounted photovoltaic systems shall be installed in accordance with the manufacturer's installation instructions.

**1509.7.4 Photovoltaic panels and modules.** Photovoltaic panels and modules mounted on top of a roof shall be listed and labeled in accordance with UL 1703 and shall be installed in accordance with the manufacturer's installation instructions.

**1509.8 Other rooftop structures.** Rooftop structures not regulated by Sections 1509.2 through 1509.7 shall comply with Sections 1509.8.1 through 1509.8.5 as applicable.

**1509.8.1 Aerial supports.** Aerial supports shall be constructed of noncombustible materials.

**Exception:** Aerial supports not greater than 12 feet (3658 mm) in height as measured from the roof deck to the highest point on the aerial supports shall be permitted to be constructed of combustible materials.

**1509.8.2 Bulkheads.** Bulkheads used for the shelter of mechanical or electrical equipment or vertical shaft openings in the roof assembly shall comply with Section

1509.2 as penthouses. Bulkheads used for any other purpose shall be considered as an additional story of the building.

**1509.8.3 Dormers.** Dormers shall be of the same type of construction as required for the roof in which such dormers are located or the exterior walls of the building.

**1509.8.4 Fences.** Fences and similar structures shall comply with Section 1509.6 as mechanical equipment screens.

**1509.8.5 Flagpoles.** Flagpoles and similar structures shall not be required to be constructed of noncombustible materials and shall not be limited in height or number.

## SECTION 1510 REROOFING

**1510.1 General.** Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

**Exception:** Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.

**1510.2 Structural and construction loads.** Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system.

**1510.3 Recovering versus replacement.** New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

**Exceptions:**

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

**1510.4 Roof recovering.** Where the application of a new roof covering over wood shingle or shake roofs creates a combustible concealed space, the entire existing surface shall be covered with gypsum board, mineral fiber, glass fiber or other approved materials securely fastened in place.

**1510.5 Reinstallation of materials.** Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled.

**1510.6 Flashings.** Flashings shall be reconstructed in accordance with approved manufacturer's installation instructions. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.

## SECTION 1511 SOLAR PHOTOVOLTAIC PANELS/MODULES

**1511.1 Solar photovoltaic panels/modules.** Solar photovoltaic panels/modules installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of this code (see Section 3111) and the California Fire Code.

**1511.1.1 Structural fire resistance.** The structural frame and roof construction supporting the load imposed upon the roof by the photovoltaic panels/modules shall comply with the requirements of Table 601 and Section 602.1.

## SECTION 1512 [DSA-SS & DSA-SS/CC, OSHPD 1, 2 & 4] SEISMIC ANCHORAGE OF SLATE SHINGLE, CLAY AND CONCRETE TILE ROOF COVERINGS

**1512.1 Fasteners.** Nails shall be long enough to penetrate into the sheathing  $\frac{3}{4}$  inch (19 mm). Where sheathing is less than  $\frac{3}{4}$  inch (19 mm) in thickness, nails shall be driven into supports, unless nails with ring shanks are used.

All fasteners shall be corrosion resistant and fabricated of copper, stainless steel, or brass, or shall have a hot dipped galvanized coating not less than 1.0 ounce of zinc per square foot (305 gm/m<sup>2</sup>).

Nails for slate shingles and clay or concrete tile shall be copper, brass or stainless steel with gage and length per common ferrous nails.

**1512.2 Wire.** Wire for attaching slate shingles and clay or concrete tile shall be copper, brass or stainless steel capable of supporting four times the weight of tile.

Wire supporting a single tile or shingle shall not be smaller than  $\frac{1}{16}$  inch (1.6 mm) in diameter. Continuous wire

*ties supporting more than one tile shall not be smaller than 0.084 inch (2 mm) in diameter.*

**1512.3 Metal strips.** Metal strips for attaching slate shingles and clay or concrete tile shall be copper, brass or stainless steel capable of supporting four times the weight of tile.

**1512.4 Clay or concrete tiles.** Clay or concrete tile shall be installed in accordance with Table 1507.3.7 and as described herein.

1. *On wood roofs or roofs of other material to which wood strips are secured, every cover or top tile when fastened with nails shall be nailed directly into 1 $\frac{1}{4}$  inches (32 mm) sound grain soft wood strips of sufficient height to support the tile.*

*Pan or bottom tiles shall be nailed directly to the roof sheathing or to wood strips. Wood strips shall be secured to the roof by nails spaced not over 12 inches (305 mm) apart.*

2. *On concrete roofs, wires shall be secured in place by wire loops embedded into the concrete not less than 2 inches (51 mm). The wire loops shall be spaced not more than 36 inches (914 mm) on center parallel to the eaves, and spaced vertically to allow for the minimum 3 inches (76 mm) lapping of the tile.*
3. *Where continuous ties of twisted wire, interlocking wires or metal strips extending from the ridge to eave are used to attach tile, the ties shall be attached to the roof construction at the ridge, eave and at intervals not exceeding 10 feet 0 inch (3048 mm) on center. The ties within 2 feet (610 mm) of the rake shall be attached at intervals of 5 feet (1524 mm).*

*Attachment for continuous ties shall be nails, screws staples or approved clips of the same material as the ties, and shall not be subjected to withdrawal forces. Attachments for continuous ties shall have an allowable working stress shear resistance of not less than twice the dead weight of the tile tributary to the attachment, but not less than 300 pounds (136 kg).*

4. *Tile with projecting anchor lugs at the bottom of the tiles shall be held in position by means of 1- inch by 2-inch (25mm by 51mm) wood striping nailed to the roof sheathing over the underlay.*
5. *Clay or concrete tile on roofs with slopes exceeding 24 units vertical in 12 units horizontal (200 percent slope) shall be attached as required for veneer in Chapter 14. The nose of all tiles shall be securely fastened.*
6. *Clay or concrete tile shall have a minimum of two fasteners per tile. Tiles that are 8 inches (203 mm) in width or less are permitted to be fastened at the center of the head with one fastener per tile.*
7. *Interlocking clay or concrete tile shall have a minimum of one nail near center of head or two wire ties per tile.*

**1512.5 Slate shingles.** Slate shingles on roofs with slopes exceeding 24 units vertical in 12 units horizontal (200 percent slope) shall be attached as required for veneer per Chapter 14.



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## HISTORY NOTE APPENDIX

**California Building Code  
Title 24, Part 2, California Code of Regulations (CCR)**

For prior code history, see the History Note Appendix to the *California Building Code (CBC)*, 2010 Triennial Edition effective January 1, 2011.

1. BSC 03/12, SFM 02/12, OSHPD 03/12 & 04/12, DSA-SS 02/12, HCD 06/12, HCD 08/12, DSA-AC 01/12, BSCC 01/12, CDPH 01/12, SLC 01/12 — Adoption of the 2012 edition of the *International Building Code* published by the International Code Council, for incorporation into the 2013 *California Building Code*, CCR Title 24, Part 2 with amendments for State regulated occupancies effective on January 1, 2014.
2. Errata to correct editorial errors within the preface as well as throughout various chapters in this code. Effective January 1, 2014.
3. OSHPD EF 01/14—Emergency regulations based on AB 980 (Chapter 663 Statutes of 2013). Delete Section 1226.7, Chapter 12, Part 2, Title 24. Approved as an emergency on April 22, 2014, filed with Secretary of State on April 23, 2014 and effective April 23, 2014.
4. SFM EF 01/14—Emergency regulations to amend Section 1505.9, Chapter 15, Part 2, Title 24 for a delayed effective date of UL 1703 fire classification. Approved as an emergency on April 22, 2014, filed with Secretary of State on April 23, 2014 with a delayed effective date of January 1, 2015.
5. *2013 Intervening Cycle Supplement; BSC 02/13, CDPH 01/13, DSA-AC 01/13, HCD 02/14 & HCD 04/13, OSHPD 01/13 & 02/13, SFM 01/13 – Approved by the California Building Standards Commission on July 22, 2014. Published on January 1, 2015 and effective July 1, 2015.*
6. *Errata to correct editorial errors within various chapters throughout the code. Effective July 1, 2015.*

