Item 1. Wildland Urban Interface Workgroup – CBC
WUI 2019 INTERVENING PROPOSALS
CBC:
705A.1, 705A.2, 706A.2, 706A.2.1 (New), 706A.3, 709A.1, 709A.1.1 (New), 709A.3

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. Roof assemblies in the Fire Hazard Severity Zones shall be Class A rating when tested in accordance with ASTM E108 or UL790.

705A.2 Roof coverings. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to resist the intrusion of flames and embers, be fir estopped with approved materials or have one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking. Where the roofing profile has an airspace under the roof covering, installed over a combustible deck, a 72 lb. (32.7kg) cap sheet complying with ASTM D3909 Standard Specification for “Asphalt Rolled Roofing (Glass Felt) Surfaced with Mineral Granules”, shall be installed over the roof deck.

Alternately, a class A fire rated roof underlayment, tested in accordance with ASTM E108, shall be permitted to be used. If the sheathing consists of exterior rated fire retardant treated wood, the underlayment shall not be required to comply with a Class A classification. Bird stops shall be used at the eaves when the profile fits, to prevent debris at the eave. Hip and ridge caps shall be sealed in to prevent intrusion of fire or embers.

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 Wildland Flame and Ember Resistant (WUI) vents approved and listed by the California State Fire Marshal, or WUI vents listed to ASTM E2886, by complying with all metal wire mesh, vents, other materials or other devices that meet one of the following requirements:

1. Vents shall be listed to ASTM E2886 and comply with all of the following:
   1.1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
   1.2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
   1.3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2. Vents shall comply with all of the following:
2.1. The dimensions of the openings therein shall be a minimum of 1/16-inch (1.6 mm) and shall not exceed 1/8-inch (3.2 mm).

2.2. 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.

2.3. The materials used shall be corrosion resistant.

706A.2.1 The requirements of 706.A.2 shall apply to gable ends, ridge ends, crawl spaces (foundations) and all other ventilation vents that mount on a vertical wall.

706A.3 Ventilation openings on the underside of eaves and cornices. Vents shall not be installed on the underside of eaves and cornices unless the vents are Wildland Flame and Ember Resistant (WUI) vents approved and listed by the California State Fire Marshal, or WUI vents listed to ASTM E2886, by complying with all of the following requirements:

Exceptions:
1. Vents listed to ASTM E2886 and complying with all of the following:

4.1. 1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.

4.2. 2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.

4.3. 3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Exceptions:
2.1. The enforcing agency shall be permitted to accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.

3.2. Vents complying with the requirements of Section 706A.2 shall be permitted to be installed on the underside of eaves and cornices in accordance with all either one of the following conditions:

3.1.2.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 and or,

3.2.2.2. The exterior wall covering and exposed underside of the eave are of noncombustible materials,
or ignition-resistant materials, as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material and the requirements of Section 704A.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio or similar surface.

709A.1 General. The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of this section.

709A.1.1 Flashing. A minimum of a 6 in. (150 mm) metal flashing, applied vertically on the exterior of the wall, shall be installed at all deck-to-wall intersections.

709A.3 Decking Surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. Material that complies with the performance requirements of Section 709A.4 when tested in accordance with both ASTM E2632 and ASTM E2726.

2. Ignition-resistant material that complies with the performance requirements of 704A.3 when tested in accordance with ASTM E84 or UL 723.

3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.

4. Exterior fire retardant treated wood

5. Noncombustible material

6. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also composed of noncombustible or ignition-resistant material.

   Exception: Wall material shall be permitted to be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E84 with a Class B flame spread index rating.

7. Any material that complies with the performance requirements of Section 709A.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also composed of only noncombustible or ignition-resistant materials.

   Exception: Wall material shall be permitted to be of any material that otherwise complies with this chapter when the decking surface material
complies with the performance requirements ASTM E84 with a Class B flame spread index rating.
Item 2. I-3 Occupancy Workgroup – CBC

I-3 OCCUPANCY 2019 INTERVENING PROPOSALS

CBC:
310.3.1, 408.1.2.2, 408.3.6, TABLE 408.3.13 (New), 408.13, TABLE 504.3, TABLE 504.4, TABLE 506.2, TABLE 508.4. 435.16 (Renumbered from 510.10), 1004.5, TABLE 1004.5, TABLE 1020.2, 1227.5, 1227.5.2, 1227.6-1227.6.3, 1227.7.4, 1227.8.1, 1227.9.1, 1227.9.1.1, 1227.9.2.2, 1227.10-1227.10.7, 1227.12.1, 1227.22.1.1, 1227.23.1, 1230.1.2, 1230.1.4-1230.10, 1230.1.12, 1230.1.16, 1230.1.23, 1230.1.26, 1230.2.7, 1230.2.8, 1230.2.10, 1231.2.2, 1231.2.3, 1231.2.5131.2.6, 1231.2.7, 1231.2.8, 1231.2.9, 1231.2.10, 1231.2.24, 1231.3.8, 1231.3.10, 1231.5, 1231.6-1231.6.7

Associated CFC:
202,1004.5, TABLE 1004.5, TABLE 1020.2

310.3.1 Residential Group R-2.1. Residential Group R-2.1 occupancies 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 435 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.

408.1.2.2 Intervening spaces. Common rooms and spaces within Group I-3 occupancies of Type 1 construction can be considered an intervening space in accordance with Section 1016.2 when the area is contained within housing units and or suites, and not considered a corridor, when they meet any of the following:

1. Within prisons and local detention facilities of Type I Construction, the exit access within a housing unit may be a non-rated corridor provided the required exit occupant load from any dayroom does not exceed 64 persons.

2. Within prison, jails, and courthouses: Circulation within any temporary holding suite of Type I construction and an occupant load less than 100.

3. Within prisons and local detention facilities, areas within secure mental health treatment facilities, correctional medical or mental health housing suites, of Type I construction and an occupant load less than 100.

4. Within prisons and local detention facilities of Type I Construction, detention program housing units or suites having an occupant load less than 100.

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 \( 37 \times 0.65 \text{ m}^2 \) square feet per person. A gate shall be provided from the safe dispersal area to allow for necessary relocation of occupants.

<table>
<thead>
<tr>
<th>FUNCTION OF SPACE</th>
<th>OCCUPANT LOAD FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detention Facilities</td>
<td></td>
</tr>
<tr>
<td>Housing Pod</td>
<td>Number of beds and staff</td>
</tr>
<tr>
<td>Refuge Area</td>
<td>6 net</td>
</tr>
<tr>
<td>Safe Dispersal Area</td>
<td>7 net</td>
</tr>
<tr>
<td>Instructional classroom</td>
<td>20 net</td>
</tr>
<tr>
<td>Exercise yard or rooms</td>
<td>50 gross</td>
</tr>
<tr>
<td>Dorms sleeping area</td>
<td>35 net</td>
</tr>
<tr>
<td>Holding Cell</td>
<td>10 sf per person / 40 sf minimum</td>
</tr>
</tbody>
</table>
a. Temporary holding cells, rooms or areas shall be calculated based on policies and procedures approved by the authority having jurisdiction. See 408.3.11 for number of exits required.

b. Program rooms, day rooms and recreational yards which are dedicated to a housing pod are not factored into the total occupant load of the building. Exiting from individual rooms shall meet the egress requirements of Chapter 10.

c. See Chapter 12 for specific requirements based on type of detention facility.

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 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 F1233-98, Class III glass, or; California Department of Corrections and Rehabilitation, CDCR 860-94d Appendix H, 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-resistive 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 m2) with neither width nor height exceeding 12 feet (3658 mm).

### TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE \(^a, i\)

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE OF CONSTRUCTION</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>R-2.2(^a)</td>
<td>NS (^d)</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>S (without area increase)</td>
<td>UL 180</td>
<td>85</td>
<td>75</td>
<td>NP</td>
<td>85</td>
<td>NP</td>
<td>75</td>
</tr>
<tr>
<td>S (with area increase)</td>
<td>UL 160</td>
<td>65</td>
<td>55</td>
<td>NP</td>
<td>65</td>
<td>NP</td>
<td>55</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.
UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

(footnotes remain unchanged)

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

**TABLE 504.4—continued**
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE \( a, b, n \)

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>HT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS ( d )</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S (without area increase)</td>
<td>UL</td>
<td>12</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S (with area increase)</td>
<td>UL</td>
<td>11</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

(footnotes remain unchanged)

**TABLE 506.2—continued**
ALLOWABLE AREA FACTOR
(At = NS, S1, S13R, S13D or SM, as applicable) IN SQUARE FEET \( a, b, j \)

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>HT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS ( l )</td>
<td>UL</td>
<td>24,000</td>
<td>NP</td>
<td>24,000</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S1</td>
<td>UL</td>
<td>96,000</td>
<td>64,000</td>
<td>64,000</td>
<td>82,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S1</td>
<td>UL</td>
<td>96,000</td>
<td>64,000</td>
<td>64,000</td>
<td>82,000</td>
</tr>
</tbody>
</table>

Page 8 of 119
### OCCUPANCY CLASSIFICATION

<table>
<thead>
<tr>
<th>TYPE OF CONSTRUCTION</th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>B</th>
<th>HT</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOOTNOTES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM (without height increase)</td>
<td>UL</td>
<td>UL</td>
<td>72,000</td>
<td>48,000</td>
<td>NP</td>
<td>72,000</td>
<td>48,000</td>
<td>NP</td>
<td>61,500</td>
</tr>
<tr>
<td>SM (with height increase)</td>
<td>UL</td>
<td>UL</td>
<td>24,000</td>
<td>16,000</td>
<td>NP</td>
<td>24,000</td>
<td>16,000</td>
<td>NP</td>
<td>20,500</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m².

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. (footnotes a. through k. remain unchanged.)

I. The NS value is only for use in evaluation of single-occupancy, multistory building buildings per the formula in section 506.2.3.

#### TABLE 508.4

**REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>R-1², R-2², R-2.2², R-3², R-3.1², R-4²</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>NS</td>
</tr>
<tr>
<td>R-1², R-2², R-2.2², R-3², R-3.1², R-4²</td>
<td>N</td>
</tr>
</tbody>
</table>

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.

**435.16 510.10** Group R-2.1, R-3.1, R-4 [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 m²). The fire-resistive protection of the exterior walls shall not be less than one hour where such walls are
located within 5 feet (1524mm) of the property line. Openings within such walls are not permitted. Openings in exterior nonrated walls need not be protected.

1004.5 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 1004.5. 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 1004.5. Where an intended function is not listed in Table 1004.5, the building official shall establish a function based on a listed function that most nearly resembles the intended function.

Exceptions:

1. 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.

2. For occupant loads within Correctional Treatment Centers, specific area requirements listed in Section 1227 shall apply.

3. For occupant loads within Juvenile Facilities, specific area requirements listed in Section 1230 shall apply.

4. For occupant loads within Local Detention facilities, specific area requirements listed in Section 1231 shall apply.

<table>
<thead>
<tr>
<th>TABLE 1004.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FUNCTION OF SPACE</th>
<th>OCCUPANT LOAD FACTOR a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional areas</td>
<td></td>
</tr>
<tr>
<td>Inpatient treatment areas</td>
<td>240 gross</td>
</tr>
<tr>
<td>Outpatient areas</td>
<td>100 gross</td>
</tr>
<tr>
<td>Sleeping areas</td>
<td>120 gross</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

a. Floor area in square feet per occupant.

b. See Section 453.2

c. See Section 408.3.13 for I-3 Facilities

<table>
<thead>
<tr>
<th>TABLE 1020.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINIMUM CORRIDOR WIDTH</td>
</tr>
</tbody>
</table>
### Occupancy

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>MINIMUM WIDTH (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I-2 and I-3 in areas where required for bed movement</td>
<td>96</td>
</tr>
<tr>
<td>Corridors in Group I-2 and I-3 occupancies serving any area caring for one or more non-ambulatory persons.</td>
<td>96</td>
</tr>
</tbody>
</table>

[SFM proposed to adopt the following Chapter 12 sections: 1227.5, 1227.5.2, 1227.6-1227.6.3, 1227.7.4, 1227.8.1, 1227.9.1, 1227.9.1.1, 1227.9.2.2, 1227.10-1227.10.7, 1227.12.1, 1227.22.1.1, 1227.23.1, 1230.1.2, 1230.1.4-1230.10, 1230.1.12, 1230.1.16, 1230.1.23, 1230.1.26, 1230.2.7, 1230.2.8, 1230.2.10, 1231.2.2, 1231.2.3, 1231.2.5-1231.2.6, 1231.2.7, 1231.2.8, 1231.2.9, 1231.2.10, 1231.2.24, 1231.3.8, 1231.3.10, 1231.5, 1231.6-1231.6.7]

### 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 F1233-98, Class III glass, or; California Department of Corrections and Rehabilitation, CDCR 860-94d Appendix H, Class C glass or; H.P. White Laboratory, Inc., HPW-TP-0500.02, Forced Entry Level III.

### Item 3. I-3 Occupancy Workgroup – CFC

I-3 OCCUPANCY 2019 INTERVENING PROPOSALS

CFC:

202,1004.5, TABLE 1004.5, TABLE 1020.2

Associated CBC:

310.3.1, 408.1.2.2, 408.3.6, TABLE 408.3.13 (New), 408.13, TABLE 504.3, TABLE 504.4, TABLE 506.2, TABLE 508.4, 435.16 (Renumbered from 510.10), 1004.5, TABLE 1004.5, TABLE 1020.2, 1227.5, 1227.5.2, 1227.6-1227.6.3, 1227.7.4, 1227.8.1, 1227.9.1, 1227.9.1.1, 1227.9.2.2, 1227.10-1227.10.7, 1227.12.1, 1227.22.1.1, 1227.23.1, 1230.1.2, 1230.1.4-1230.10, 1230.1.12, 1230.2.7, 1230.2.8, 1230.2.10, 1231.2.2, 1231.2.3, 1231.2.5-1231.2.6, 1231.2.7, 1231.2.8, 1231.2.9, 1231.2.10, 1231.2.24, 1231.3.8, 1231.3.10, 1231.5, 1231.6-1231.6.7

### Section 202

**Residential Group R-2.1.** Residential Group R-2.1 occupancies 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 435 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.

1004.5 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 1004.5. 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 1004.5. Where an intended function is not listed in Table 1004.5, the building official shall establish a function based on a listed function that most nearly resembles the intended function.

Exceptions:

1. 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.

2. For occupant loads within Correctional Treatment Centers, specific area requirements listed in Section 1227 shall apply.

3. For occupant loads within Juvenile Facilities, specific area requirements listed in Section 1230 shall apply.

4. For occupant loads within Local Detention facilities, specific area requirements listed in Section 1231 shall apply.

TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT
FUNCTION OF SPACE | OCCUPANT LOAD FACTOR a
---|---
Institutional areas | 240 gross
Inpatient treatment areas | 100 gross
Outpatient areas | 120 gross
Sleeping areas | 120 gross

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

a. Floor area in square feet per occupant.

b. See Section 453.2
c. See Section 408.3.13 for I-3 Facilities

Table 1020.2
MINIMUM CORRIDOR WIDTH

<table>
<thead>
<tr>
<th>OCCUPANCY</th>
<th>MINIMUM WIDTH (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I-2 and I-3 in areas where required for bed movement</td>
<td>96</td>
</tr>
<tr>
<td>Corridors in Group I-2 and I-3 occupancies serving any area caring for one or more non-ambulatory persons.</td>
<td>96</td>
</tr>
</tbody>
</table>

Item 4. Elevator Workgroup – CBC

CBC:
- 3002.4a, 3002.4.1a, 3002.4.2a, 3002.4.3a, 3002.4.4a, 3002.4.5a, 3002.4.6a, 3002.4.7a, 3002.5, 3002.6, 3002.6.1 (New), 3002.9, 3002.11 (New), 3003.1, 3003.1.4, 3003.1.5 (New), 3003.4 (New), 3003.4.1 (New), 3003.4.2 (New), 3003.4.3 (New), 3003.4.4 (New), 3005.4.1, 3007.1, 3008.1, 3008.1.1, 3008.1.2, 3008.1.3, 3008.1.4, [Chapter 35] ASME 17.1/CSA B44, [NFPA 13-16] 8.15.5.1, 8.15.5.2, 8.15.5.3, 8.15.5.7.1, 8.15.5.7.2

Associated CFC:
- 606.2, 606.2.4, 606.2.5 (New), 606.8.6 (New), 606.8.6.1 (New), 606.8.6.2 (New), 606.8.6.3 (New), 606.8.6.4 (New), 1103.3, 1103.3.1, 1103.3.2, 1103.3.3 (New), [Chapter 80] ASME A17.1/CSA B44, ASME A17.3, [NFPA 13-16] 8.15.5.1, 8.15.5.2, 8.15.5.3, 8.15.5.7.1, 8.15.5.7.2, [Appendix K] K104.3.1, K104.3.2, K105

SECTION 3002
HOISTWAY ENCLOSURES

3002.4a General stretcher requirements. All buildings and structures with one or more passenger service elevators shall be provided with not less than one medical emergency service elevator to all landings meeting the provisions of Section
3002.4a. The medical emergency service elevator(s) shall be identified in the construction documents specified in section 107 or the California Administrative Code.

**Exceptions:**
1. (exceptions remain unchanged)

**3002.4.1a Gurney size.** The medical emergency service elevator shall accommodate the loading and transport of two emergency personnel, each requiring a minimum clear 21-inch (533 mm) diameter circular area and an ambulance gurney or stretcher [maximum minimum size 24 inches by 84 inches (610 mm by 2134 mm) with not less than 5-inch (127 mm) radius corners] in the horizontal, open position.

**3002.4.2a Hoistway doors.** (no proposed changes, kept section in sequence for reader ease.)

**3002.4.3a Elevator entrance openings and car size.** The elevator car shall be of such a size and arrangement to accommodate a 24-inch by 84-inch (610 mm by 2134 mm) ambulance gurney or stretcher with not less than 5-inch (127 mm) radius corners, in the horizontal, open position, shall be provided with a minimum clear distance between walls or between walls and door excluding return panels not less than 80 inches by 54 inches (2032 mm by 1372 mm), and a minimum distance from wall to return panel not less than 51 inches (1295 mm) with a 42-inch (1067 mm) side slide door.

**Exception:** The elevator car dimensions and/or the clear entrance opening dimensions may be altered where it can be demonstrated to the local jurisdictional authority's satisfaction that the proposed configuration will handle the designated gurney or stretcher with equivalent ease. Documentation from the local authority shall be provided to the Occupational Safety and Health Standards Board.

**3002.4.43a Elevator recall.** The elevator(s) designated the medical emergency elevator shall be equipped with a key switch to recall the elevator nonstop to the main floor. For the purpose of this section, elevators in compliance with Section 3003.2 shall be acceptable.

**3002.4.54a Designation.** Medical emergency elevators shall be identified by the international symbol (Star of Life) for emergency medical services.

**3002.4.65a Symbol size.** The symbol shall not be less than 3 inches (76 mm) in size.

**3002.4.76a Symbol location.** A symbol shall be permanently attached to each side of the hoistway door frame on the portion of the frame at right angles to the hallway or landing area. Each symbol shall be not less than 78 inches (1981 mm) and not more than 84 inches (2134 mm) above the floor level at the threshold.
3002.5 Emergency doors. Emergency doors in blind hoistways as described in ASME A17.1, Section 2.11.1.2, and access panels as described in ASME A17.1, Section 2.11.1.4, are prohibited in accordance with California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders. Where an elevator is installed in a single blind hoistway or on the outside of a building, emergency doors shall be in conformance with the California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

3002.6 Prohibited doors. Doors, other than hoistway doors and the elevator car door, shall be prohibited at the point of access to an elevator car unless such doors are readily openable from the car side without a key, tool, special knowledge or effort.

3002.6.1 Prohibited Hoistway Access Doors and Panels. The following types of access doors and panels are prohibited in accordance with the California Code Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders:

1. Access panels or doors to working platforms in the line of movement of the car counterweight in the hoistway.

2. Access panels or doors in the hoistway for access to car or hoistway transparent enclosures.

3002.9 Plumbing and mechanical systems. Plumbing and mechanical systems shall not be located in an elevator hoistway enclosure unless permitted by California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

Exception: Floor drains, and sumps and sump pumps shall be permitted at the base of the hoistway enclosure provided that they are indirectly connected to the plumbing system.

3002.11 Pit Access Door. Where separate pit access door(s) are required for access to pit(s) located below the bottom hoistway door landing, permanent stairway access shall be provided to the access door.

SECTION 3003
EMERGENCY OPERATIONS

[F] 3003.1 Standby power. In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Section 1203 of the California Fire Code and Sections 3003.1.1 through 3003.1.45 of this code.

[F] 3003.1.4 Venting-Temperature and Humidity Control. Where standby power is connected to elevators, the machine room, machine space, control room, and control space ventilation or air conditioning system shall be connected to the standby power source.
[F] **3003.1.5 Emergency Hoistway Venting.** Where standby power is connected to elevators, the emergency hoistway ventilation system, if required, shall be connected to the standby power source.

[F] **3003.4 Emergency Hoistway Venting.** Elevator hoistways containing the driving machine shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

**3003.4.1 Location of vents.** Vents shall be located at the top of the hoistway and shall open either directly to the outer air or through noncombustible ducts to the outer air.

**3003.4.2 Area of vents.** Except as provided for in Section 3003.1.4.4 of the California Building Code, the area of the vents shall be not less than 3½ percent of the area of the hoistway nor less than 3 square feet (0.28 m²) for each elevator car.

**3003.4.3 Operation of vents.** Vent openings shall automatically open upon detection of smoke in the elevator hoistway and upon activation of a manual override control. The manual override control shall be capable of opening and closing the vents and shall be located in an approved location. Smoke detectors provided in elevator hoistways to activate the hoistway ventilation system, shall also be required to activate the elevator Phase I emergency recall operation function in accordance with California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

**3003.4.4 Reduced vent area.** Where mechanical ventilation conforming to the California Mechanical Code is provided, a reduction in the required vent area is allowed provided that all of the following conditions are met:

1. The vents required by Section 3003.1.4.1 of the California Building Code do not have outside exposure.
2. The hoistway does not extend to the top of the building.
3. The hoistway exhaust fan is automatically reactivated by thermostatic means.
4. Equivalent venting of the hoistway is accomplished.

**SECTION 3005**
**MACHINE ROOMS**

**3005.1 Access.** An permanent and approved means of access shall be provided to elevator machine rooms, control rooms, control spaces and machinery spaces.
3005.2 Venting Temperature and Humidity Control. Elevator machine rooms, machinery spaces that contain the driving machine, and control rooms or spaces that contain the operation or motion controller for elevator operation shall be provided with an independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining maintain the temperatures and humidity within the range established for by the manufacturer of the elevator equipment.

3005.3 Pressurization. (section unchanged, included for reader ease)

3005.4 Machine rooms, control rooms, machinery spaces, and control spaces. (no proposed change, the section title is included for reader ease.)

3005.4.1 Automatic sprinkler system. Automatic sprinklers shall not be required to be installed in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room where all the following are met:

1. Approved smoke detectors shall be installed in the elevator hoistway, elevator machine room, elevator machinery spaces, elevator control spaces, or elevator control rooms and connected to the building fire alarm system in accordance with Section 907.

2. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause the actuation of the building fire alarm notification appliances in accordance with Section 907.

3. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause all elevators having any equipment located in that elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room to recall nonstop to the appropriate designated floor in accordance with CCR Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

4. The elevator machine room, elevator machinery space, elevator control space, or elevator control room shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors. The exceptions to Section 3005.4 shall not apply.

5. The building fire alarm system shall be monitored by an approved supervising station in accordance with Section 907.
6. An approved sign shall be permanently displayed in the elevator machine room, elevator machinery space, elevator control space, or elevator control room in a conspicuous location with a minimum of 1 ½ inch letters on a contrasting background, stating:

NO COMBUSTIBLE STORAGE PERMITTED IN THIS ROOM
By Order of the Fire Marshal [or name Fire authority]

3005.4.1 Dedicated Control Room. Elevator motor and motion control equipment shall be installed in a dedicated elevator machine room or control room located outside the hoistway. The machine room or control room shall be of sufficient size to accommodate the elevator equipment and the required minimum electrical clearances in accordance with Article 110.26 of the California Electrical Code.

SECTION 3007
FIRE SERVICE ACCESS ELEVATOR

3007.1 General. Where required by Section 403.6.1, every floor above and including the lowest level of fire department vehicle access of the building shall be served by fire service access elevators complying with Sections 3007.1 through 3007.9. Except as modified in this section, fire service access elevators shall be installed in accordance with this chapter and California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

Exception: Elevators that only service an open or enclosed parking garage and the lobby of the building shall not be required to serve as fire-service access elevators.

SECTION 3008
OCCUPANT EVACUATION ELEVATORS

3008.1 General. Where [e]levators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with Sections 3008.1 through 3008.10. Where other elevators are used for occupant self-evacuation, those elevators shall comply with these sections.

3008.1.1 Number of occupant evacuation elevators. The number of elevators available for occupant evacuation shall be determined based on an egress analysis that addresses one of the following scenarios:

1. Full-building evacuation where the analysis demonstrates that the number of elevators provided for evacuation results in an evacuation time less than 1 hour.
2. Evacuation of the five consecutive floors with the highest cumulative occupant load where the analysis demonstrates that the number of elevators provided for evacuation results in an evacuation time less than 15 minutes. Not less than one elevator in each bank shall be designated for occupant evacuation. Not less than two shall be provided in each occupant evacuation elevator lobby where more than one elevator opens into the lobby. Signage shall be provided to denote which elevators are available for occupant evacuation.

3008.1.2 Additional exit stairway. Where an additional means of egress is required in accordance with Section 403.5.2, an additional exit stairway shall not be required to be installed in buildings provided with occupant evacuation elevators complying with Section 3008.1.

3008.1.3 Fire safety and evacuation plan. (language remains unchanged)

3008.1.4 Operation. (language remains unchanged)
13—16: Standard for Installation of Sprinkler Systems as amended*  
712.1.3.1, 903.3.1.1, 903.3.2, 903.3.8.2, 903.3.8.5, 904.12, 905.3.4, 907.6.4, 1019.3  
*NFPA 13, Amended Sections as follows:  

Delete language to section 8.15.5.1 and reserve section number.  
8.15.5.1* Reserved. Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft (600 mm) above the floor of the pit.  

Delete language to section 8.15.5.2 and reserve section number.  
8.15.5.2 Reserved. The sprinkler required at the bottom of the elevator hoistway by 8.15.5.1 shall not be required for enclosed, noncombustible elevator shafts that do not contain combustible hydraulic fluids.  

Revise Section 8.15.5.3 as follows:  
[Delete California Amendment to 8.15.5.3]  
8.15.5.3 Automatic sprinkler system. Automatic sprinklers shall not be required to be installed in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room where all the following are met:  
1. Approved smoke detectors shall be installed and connected to the building fire alarm system in accordance with Section 907 in the area where the fire sprinkler was removed per this section.  
2. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause the actuation of the building fire alarm notification appliances in accordance with 907.  
3. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause all elevators having any equipment located in that elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room to recall nonstop to the appropriate designated floor in accordance with CCR Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.  
4. The elevator machine room, elevator machinery space, elevator control space, or elevator control room shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors. The exceptions to Section 3005.4 shall not apply.
5. The building fire alarm system shall be monitored by an approved supervising station in accordance with 907.

6. An approved sign shall be permanently displayed in the room where the fire sprinkler was removed per this section in a conspicuous location with a minimum of 1½ inch letters on a contrasting background, stating:

   NO COMBUSTIBLE STORAGE
   PERMITTED IN THIS ROOM
   By Order of the Fire Marshal [or name of fire authority]

[Revise NFPA13-16 section 8.15.5.3 by deleting condition (2) and renumbering the following conditions]

8.15.5.3 Automatic fire sprinklers shall not be required in elevator machine rooms, elevator machinery spaces, control spaces, or hoistways of traction elevators installed in accordance with the applicable provisions in NFPA 101 the California Building Code or the applicable building code, where all of the following conditions are met:

   (1) The elevator machine room, machinery space, control room, control space, or hoistway of traction elevator is dedicated to elevator equipment only.

   (2) The elevator machine room, machine room, machinery space, control room, control space, or hoistway of traction elevators are protected by smoke detectors, or other automatic fire detection, installed in accordance with NFPA72.

   (3) The elevator machinery space, control room, control space, or hoistway of traction elevators is separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire resistance rating of not less than that specified by the applicable building code.

   (4) No materials unrelated to elevator equipment are permitted to be stored in elevator machine rooms, machinery spaces, control rooms, control spaces, or hoistways of traction elevators.

   (5) The elevator machinery is not of the hydraulic type.

8.15.5.7 Combustible Suspension in Elevators. (no changes, included for reader ease)

Revise Section 8.15.5.7.1 as follows:

8.15.5.7.1 Sprinklers shall not be installed at the top and bottom of elevator in hoistways of passenger elevators complying with Section 9.3.6.7.2, where elevators utilize combustible suspension means such as noncircular elastomeric-coated or polyurethane-coated steel belts.
8.15.5.7.2 The sprinklers in the elevator hoistway shall not be required when the All elevators utilizing suspension means, other than steel wire ropes, provide shall have not less than an FT-1 rating when tested to the vertical burn test requirements of UL 62, Flexible Cords and Cables, and UL 1581, Reference Standard for Electrical Wires, Cables, and Flexible Cords.

Item 5. Elevator Workgroup – CFC
ELEVATOR 2019 INTERVENING PROPOSALS
CFC:
606.1.1 (New), 606.2, 606.2.4,606.2.5 (New), 606.8.6 (New), 606.8.6.1 (New),
606.8.6.2 (New), 606.8.6.3 (New), 606.8.6.4 (New), 1103.3, 1103.3.1, 1103.3.2,
1103.3.3 (New), [Chapter 80] ASME A17.1/CSA B44, ASME A17.3, [NFPA 13-16]
8.15.5.1, 815.5.2, 8.15.5.3, 815.5.7.1, 8.15.5.7.2, [Appendix K] K104.3.1, K104.3.2,
K105

Associated CBC:
3002.4a, 3002.4.1a, 3002.4.2a, 3002.4.3a, 3002.4.4a, 3002.4.5a, 3002.4.6a, 3002.4.7a,
3002.5, 3002.6, 3002.6.1 (New), 3002.9, 3002.11 (New), 3003.1, 3003.1.4, 3003.1.5
(New), 3003.4 (New), 3003.4.1 (New), 3003.4.2 (New), 3003.4.3 (New), 3003.4.4
(New), 3005.4.1, 3007.1, 3008.1, 3008.1.1, 3008.1.2, 3008.1.3, 3008.1.4, [Chapter 35]
ASME 17.1/CSA B44, [NFPA 13-16] 8.15.5.1, 8.15.5.2, 8.15.5.3, 8.15.5.7.1, 8.15.5.7.2

606.1.1 Storage within elevator lobbies. Where hoistway opening protection is required by Section 3006.2 of the California Building code, elevator lobbies shall be maintained free of storage.

606.2 Standby power. In buildings and structures where standby power is required or furnished to operate an elevator, standby power shall be provided in accordance with Section 1203 of this code and Chapter 30 of the California Building Code. Operation of the system shall be in accordance with Sections 606.2.1 through 606.2.45.

606.2.4 Machine room ventilation Temperature and Humidity Control. Where standby power is connected to elevators, the machine room, machine space, control room, and control space ventilation or air conditioning system shall be connected to the standby power source.

606.2.5 Emergency Hoistway Venting. Where standby power is connected to elevators, the emergency hoistway ventilation system, if required, shall be connected to the standby power source.
606.8.6 Emergency Hoistway Venting. Elevator hoistways containing the driving machine shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

606.8.6.1 Location of vents. Vents shall be located at the top of the hoistway and shall open either directly to the outer air or through noncombustible ducts to the outer air.

606.8.6.2 Area of vents. Except as provided for in Section 3003.1.4.4 of the California Building Code, the area of the vents shall be not less than 3½ percent of the area of the hoistway nor less than 3 square feet (0.28 m²) for each elevator car.

606.8.6.3 Operation of vents. Vent openings shall automatically open upon detection of smoke in the elevator hoistway and upon activation of a manual override control. The manual override control shall be capable of opening and closing the vents and shall be located in an approved location. Smoke detectors provided in elevator hoistways to activate the hoistway ventilation system, shall also be required to activate the elevator Phase I emergency recall operation function in accordance with California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

606.8.6.4 Reduced vent area. Where mechanical ventilation conforming to the California Mechanical Code is provided, a reduction in the required vent area is allowed provided that all of the following conditions are met:

1. The vents required by Section 3003.1.4.1 of the California Building Code do not have outside exposure.

2. The hoistway does not extend to the top of the building.

3. The hoistway exhaust fan is automatically reactivated by thermostatic means.

4. Equivalent venting of the hoistway is accomplished.

1103.3 Existing elevators. In other than Group R-3, existing elevators, escalators and moving walks shall comply with the requirements of Sections 1103.3.1 and 1103.3.2.

1103.3.1 Elevators, escalators and moving walks. Existing elevators, escalators and moving walks in Group I-2, Condition 2 occupancies and serving ambulatory care facilities shall comply with ASME A17.3 California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in
accordance with ASME A17.3 California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

Exceptions:
1. (remain unchanged)

1103.3.3 Medical Emergency Elevator. For existing hoistways with elevator alterations, repairs or replacements, where the elevator car dimensions do not comply with Section 3002.4.1a of the California Building Code. The elevator car dimensions and/or the clear entrance opening dimensions may be altered where it can be demonstrated to the local jurisdictional authority's satisfaction that the proposed configuration will accommodate the designated gurney or stretcher with equivalent ease to the existing car and/or clear entrance conditions. Written documentation from the local authority shall be provided to the California Occupational Safety and Health Elevator Unit.

CHAPTER 80
REFERENCES STANDARDS

ASME
American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990

ASME A17.1—2016/CSA B44—16 the edition as referenced in: Safety Code for Elevators and Escalators, California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders
508.1.6, 606.1, 907.3.3, 1009.4.1

California Code of Regulations

A17.3—2015: Safety Code for Existing Elevators and Escalators California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders
1103.3.1, 1103.3.2

NFPA
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

13—16: Standard for Installation of Sprinkler Systems as amended*
903.3.1.1, 903.3.2, 903.3.8.2, 903.3.8.5, 904.12, 905.3.4, 907.6.4, 914.3.2, 1019.3, 1103.4.8, 1206.2.11.1, 1206.3.5.1, 3201.1, 3204.2, Table 3206.2, 3206.4.1, 3206.10, 3207.2, 3207.2.2, 3208.2.2.1, 3208.4, 3210.1, 3401.1, 5104.1, 5104.1.1, 5106.5.7, 5704.3.3.9, Table 5704.3.6.3(7), 5704.3.7.5.1, 5704.3.8.4

*NFPA 13, Amended Sections as follows:

Delete language to section 8.15.5.1 and reserve section number.
8.15.5.1* Reserved. Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft (600 mm) above the floor of the pit.

Delete language to section 8.15.5.2 and reserve section number.
8.15.5.2 Reserved. The sprinkler required at the bottom of the elevator hoistway by 8.15.5.1 shall not be required for enclosed, noncombustible elevator shafts that do not contain combustible hydraulic fluids.

Revise Section 8.15.5.3 as follows:
[Delete California Amendment to 8.15.5.3]
8.15.5.3 Automatic sprinkler system. Automatic sprinklers shall not be required to be installed in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room where all the following are met:

1. Approved smoke detectors shall be installed and connected to the building fire alarm system in accordance with Section 907 in the area where the fire sprinkler was removed per this section.

2. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause the actuation of the building fire alarm notification appliances in accordance with 907.

3. Activation of any smoke detector located in the elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room shall cause all elevators having any equipment located in that elevator hoistway, elevator machine room, elevator machinery space, elevator control space, or elevator control room to recall nonstop to the appropriate designated floor in accordance with CCR Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

4. The elevator machine room, elevator machinery space, elevator control space, or elevator control room shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors. The exceptions to Section 3005.4 shall not apply.

5. The building fire alarm system shall be monitored by an approved supervising station in accordance with 907.
6. An approved sign shall be permanently displayed in the room where the fire sprinkler was removed per this section in a conspicuous location with a minimum of 1½ inch letters on a contrasting background, stating:

NO COMBUSTIBLE STORAGE
PERMITTED IN THIS ROOM
By Order of the Fire Marshal [or name of fire authority]

[Revise NFPA13-16 section 8.15.5.3 by deleting condition (2) and renumbering the following conditions]

8.15.5.3 Automatic fire sprinklers shall not be required in elevator machine rooms, elevator machinery spaces, control spaces, or hoistways of traction elevators installed in accordance with the applicable provisions in NFPA 101 The California Building Code or the applicable building code, where all of the following conditions are met:

1. The elevator machine room, machinery space, control room, control space, or hoistway of traction elevator is dedicated to elevator equipment only.

2. The elevator machine room, machine room, machinery space, control room, control space, or hoistway of traction elevators are protected by smoke detectors, or other automatic fire detection, installed in accordance with NFPA 72.

3. The elevator machinery space, control room, control space, or hoistway of traction elevators is separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire resistance rating of not less than that specified by the applicable building code.

4. No materials unrelated to elevator equipment are permitted to be stored in elevator machine rooms, machinery spaces, control rooms, control spaces, or hoistways of traction elevators.

5. The elevator machinery is not of the hydraulic type.

8.15.5.7 Combustible Suspension in Elevators. (no changes, included for reader ease)

Revise Section 8.15.5.7.1 as follows:

8.15.5.7.1 Sprinklers shall not be installed at the top and bottom of elevator in hoistways of passenger elevators complying with Section 9.3.6.7.2, where elevators utilize combustible suspension means such as noncircular elastomeric-coated or polyurethane-coated steel belts.
8.15.5.7.2 The sprinklers in the elevator hoistway shall not be required when the All elevators utilizing suspension means, other than steel wire ropes, provide shall have not less than an FT-1 rating when tested to the vertical burn test requirements of UL 62, Flexible Cords and Cables, and UL 1581, Reference Standard for Electrical Wires, Cables, and Flexible Cords.

APPENDIX K
CONSTRUCTION REQUIREMENTS FOR EXISTING AMBULATORY CARE FACILITIES

K104.3.1 Elevators, escalators, dumbwaiters and moving walks. Existing elevators, escalators, dumbwaiters and moving walks in ambulatory care facilities required to be separated by Section 422 of the California Building Code shall comply with ASME A17.3 California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

K104.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3 California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

SECTION K105
REFERENCED STANDARDS

ASME A17.3—2015: Safety Code for Existing Elevators and Escalators California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders K104.3.1, K104.3.2

Item 6. L Occupancy Workgroup CBC

L OCCUPANCY 2019 INTERVENING PROPOSALS
CBC: 453.4.4, 453.4.7.2, 1020.5, 3001.6

Associated CFC:
Section Title 1116, 1116.7, 5003.10.2, 5003.10.4, 5003.10.44.1.1 (New), 5003.10.4.4, 5003.10.5 (New), 5003.10.5.1 (New), 5003.10.5.2 (New), 5003.10.5.2.1 (New), 5003.10.5.3 (New), 5003.10.5.5 (New), 5003.10.5.5 (New), 5003.10.5.6 (New), 5003.10.5.7 (New), 5003.10.6 (New), 5003.10.6.1 (New), 5003.10.6.2 (New)

453.4.4 Emergency response equipment area. When required by the fire code official, 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 m²), for spill
mitigation supplies per California Fire Code 5001.3.3.4 in a location approved by the fire code official, and identified with signage.

**Exception:** The area size for spill mitigation supplies may be reduced by the fire code official when adequate supplies are provided.

### 453.4.7.2 Fire dampers, smoke dampers and combination fire/smoke dampers.

Fire dampers, smoke dampers or fire/smoke dampers shall not be permitted in 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 or vertical assembly having a fire resistance rating equal to the fire barrier.

### 453.9 Existing Group L or and Group H-8 occupancies, additions, alterations, or repairs.

See California Fire Code Chapter 11, Section 1116 and California Existing Building Code Section 316.

### 1020.5 Air movement in corridors.

Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

**Exceptions:**

1. (exceptions 1 through 3 remain unchanged)
4. Incidental air movement from pressurized rooms within health care facilities and Group L occupancies, provided that the corridor is not the primary source of supply or return to the room.

### 3001.6 Elevators utilized to transport hazardous materials.

Elevators utilized to transport hazardous materials shall also comply with the California Fire Code Sections 5003.10.2.2, 5003.10.4 - 5003.10.7.

**Item 7. L Occupancy Workgroup CFC**

**L OCCUPANCY 2019 INTERVENING PROPOSALS**

**CFC:**

1020.5, Section Title 1116, 1116.7, 5003.10.2, 5003.10.4, 5003.10.44.1.1 (New), 5003.10.4.4, 5003.10.5 (New), 5003.10.5.1 (New), 5003.10.5.2 (New), 5003.10.5.2.1 (New), 5003.10.5.3 (New), 5003.10.5.5 (New), 5003.10.5.5 (New), 5003.10.5.6 (New), 5003.10.5.7 (New), 5003.10.6 (New), 5003.10.6.1 (New), 5003.10.6.2 (New)

**Associated CBC:**

453.4.4, 453.4.7.2, 1020.5, 3001.6

**1020.5 Air movement in corridors.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

**Exceptions:**
1. (exceptions 1 through 3 remain unchanged)
4. Incidental air movement from pressurized rooms within health care facilities and Group L occupancies, provided that the corridor is not the primary source of supply or return to the room.

SECTION 1116
EXISTING GROUP L AND GROUP H-8 OCCUPANCIES [SFM]

1116.7 Maximum allowable quantities. Existing Group H-8 Laboratory suites approved prior to January 1, 2008 shall not exceed the maximum allowable quantities listed in Tables 1116.7(1) and 1116.7(2).

5003.10.2 Carts and trucks required. Liquids in containers exceeding 5.28 gal (20 liters) in a corridor or enclosure for a stairway or ramp shall be transported on a cart or truck. Containers of hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 and transported within corridors or interior exit stairways and ramps, shall be on a cart or truck. Where carts and trucks are required for transporting hazardous materials, they shall be in accordance with Section 5003.10.3. Exceptions 1 through 4 shall not apply where elevators are utilized.

Exceptions: (remain unchanged)

5003.10.4 Elevators utilized to transport hazardous materials.

5003.10.4.1. When transporting hazardous materials, elevators shall have no other passengers other than the individual(s) handling the chemical transport cart.

5003.10.4.1.1 When transporting cryogenic or liquefied compressed gasses, there shall be no occupants in the elevator.

5003.10.4.2 Hazardous materials liquid containers shall have a maximum capacity of 20 liters (5.28 gal).

5003.10.4.3 Toxic and highly-toxic gases shall be limited to a container of a maximum water capacity of 1 pound.

5003.10.4.4 When transporting cryogenic or liquefied compressed gasses, means shall be provided to prevent the elevator from being summoned to other floors.

5003.10.5 Elevators or conveyance systems utilized to transport hazardous materials in excess of the quantities listed in section 5003.10.4 shall comply with sections 5003.10.5.1 thru 5003.10.5.6.

5003.10.5.1 Elevators or conveyance hoist-way enclosures shall be located in a shaft constructed in accordance with Section 713 of the California Building Code.
Elevators shall have no other passengers other than the individual handling the chemical transport and shall comply with the requirements of Section 5003.10.4.

When transporting cryogenic or liquefied compressed gasses, there shall be no occupants in the elevator.

Secondary containment shall be provided for all transported liquids.

Ventilation shall be provided in the elevator shaft in accordance with Section 5004.3.1.

Signage shall be provided on all floors adjacent to each elevator call station to indicate the elevator is designated for hazardous materials transportation.

Use of an elevator or conveyance system described in this section shall be restricted to personnel that have been properly trained.

Means shall be provided to prevent the elevator from being summoned to other floors.

A documented sequence of operation shall be submitted to the Authority Having Jurisdiction for review and approval prior to the transportation of hazardous materials in elevators or conveyance systems described in Section 5003.10.5.

The approved sequence of operations shall be posted in the elevator car or conveyance system.

The approved sequence of operation shall be maintained, and tested upon the request of the Authority having Jurisdiction.

Item 8 Tall Wood Building CBC

TALL WOOD AND HEAVY TIMBER 2019 INTERVENING PROPOSALS
CBC:
110.3.5 (New), 202, 403.3.2, TABLE 504.3, TABLE 504.4, TABLE 506.2, 508.4.4.1, 509.4.1.1 (New), TABLE 601, TABLE 602, 602.4, 602.4.1 (New), 602.4.1.1 (New), 602.4.1.2 (New), 602.4.1.2.1 (New), 602.4.1.3 (New), 602.4.1.4 (New), 602.4.1.5 (New), 602.4.1.6 (New), 602.4.2, 602.4.2.1 (New), 602.4.2.2 (New), 602.4.2.2.1 (New), 602.4.2.2.2 (New), 602.4.2.2.3 (New), 602.4.2.2.4 (New), 602.4.2.3 (New), 602.4.2.4 (New), 602.4.2.5 (New), 602.4.2.6 (New), 602.4.3, 602.4.3.1 (New), 602.4.3.2 (New), 602.4.3.3 (New), 602.4.3.4 (New), 602.4.3.5 (New), 602.4.3.6 (New), 602.4.4 (New), 602.4.4.1, 602.4.4.2, 602.4.4.3, 602.4.4 (New), 703.8 (New), 703.9 (New), 718.2.1,
110.3.5 Type IV-A, IV-B, and IV-C connection protection Inspection. In buildings of Type IV-A, IV-B and IV-C Construction, where connection fire resistance ratings are provided by wood cover calculated to meet the requirements of Section 2304.10.1 inspection of the wood cover shall be made after the cover is installed, but before any other coverings or finishes are installed.

SECTION 202 DEFINITIONS Add new definitions as follows:

MASS TIMBER. Structural elements of Type IV construction primarily of solid, built-up, panelized or engineered wood products that meet minimum cross section dimensions of Type IV construction.

NONCOMBUSTIBLE PROTECTION (FOR MASS TIMBER). Noncombustible material, in accordance with Section 703.5, designed to increase the fire resistance rating and delay the combustion of mass timber.

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 or mass timber wall that supports more than 200 pounds per linear foot (2919 N/m) of vertical load in addition to its own weight.

403.3.2 Water supply to required fire pumps. In all buildings having an occupied floor that is more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, required fire pumps shall be supplied by connections to not 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.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.

TABLE 504.3a, i
<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B, F, M, S, U</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>270 180 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A, E</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>270 180 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>250 160 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-1, H-2, H-3, H-5, L</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>120 90 85 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-4</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>140 100 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>120 80 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-3</td>
<td>NS</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-2, I-2.1</td>
<td>NS</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>NP NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-4</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>180 120 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>160 100 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-1&lt;sup&gt;h&lt;/sup&gt;</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S13D</td>
<td>60 60 60 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S13R</td>
<td>60 60 60 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>270 180 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>250 160 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-2&lt;sup&gt;h&lt;/sup&gt;</td>
<td>NS</td>
<td>65 65 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S13R</td>
<td>60 60 60 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>270 180 85 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>250 160 65 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-2.1&lt;sup&gt;h&lt;/sup&gt;</td>
<td>NS</td>
<td>65 NP NP NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>S13D</td>
<td>NP</td>
<td>NP</td>
<td>S13R</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td>----</td>
<td>----</td>
<td>------</td>
</tr>
<tr>
<td>60</td>
<td>60</td>
<td>NP</td>
<td>NP</td>
<td>60</td>
</tr>
<tr>
<td>R-2.2h</td>
<td>NS</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-3, R-3.1h</td>
<td>NS</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-2.1, R-4h</td>
<td>NS</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.
UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. (footnotes remain unchanged)
## TABLE 504.4\textsuperscript{a, b, n}
### ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A-1</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>A-2</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>A-3</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>A-4</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>A-5</td>
<td>NS</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>UL</td>
<td>UL</td>
</tr>
<tr>
<td>B</td>
<td>NS</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>E</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>F-1</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>F-2</td>
<td>NS</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>H-1</td>
<td>NS\textsuperscript{c, d}</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>H-2</td>
<td>NS\textsuperscript{c, d}</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>H-3</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>H-4</td>
<td>NS</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>H-5</td>
<td>NS</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>I-2/I-2.1</td>
<td>NS</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>I-3</td>
<td>NS</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>I-4</td>
<td>NS</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>L</td>
<td>NS</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>M</td>
<td>NS</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>R-1</td>
<td>NS</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S13R</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>R-2</td>
<td>NS</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S13R</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>S (without area increase)</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>S (with area increase)</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>R-2.1</td>
<td>NS</td>
<td>4</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S13R</td>
<td>4</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>10</td>
<td>NP</td>
</tr>
<tr>
<td>R-2.2</td>
<td>NS</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

### a. (footnotes remain unchanged; footnote l. and m. included for reference).

#### l. Nonambulatory persons shall be limited to the first 5 stories.

#### m. Nonambulatory elderly clients are not permitted in buildings of these types of construction. See Sections 435.3.3 and 435.3.4.
TABLE 506.2
ALLOWABLE AREA FACTOR
\((A_t = \text{NS, S1, S13R, S13D or SM, as applicable})\) IN SQUARE FEET \(^{a,b,j}\)

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>SEE FOOTNOTES</th>
<th>TYPE OF CONSTRUCTION</th>
<th>TYPE IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A-1</td>
<td>NS</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>180,000</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>135,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td>A-2</td>
<td>NS</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>180,000</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>135,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td>A-3</td>
<td>NS</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>180,000</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>135,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td>A-4</td>
<td>NS</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>180,000</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>135,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>45,000</td>
<td>30,000</td>
</tr>
<tr>
<td>A-5</td>
<td>NS</td>
<td>UL</td>
<td>UL</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>UL</td>
<td>UL</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>UL</td>
<td>UL</td>
</tr>
<tr>
<td>B</td>
<td>NS</td>
<td>108,000</td>
<td>72,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>432,000</td>
<td>288,000</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>324,000</td>
<td>216,000</td>
</tr>
<tr>
<td>E</td>
<td>NS</td>
<td>76,500</td>
<td>51,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>306,000</td>
<td>204,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>229,500</td>
<td>153,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>76,500</td>
<td>51,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>F-1</td>
<td>NS</td>
<td>100,500</td>
<td>67,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>402,000</td>
<td>268,000</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>301,500</td>
<td>201,000</td>
</tr>
<tr>
<td>F-2</td>
<td>NS</td>
<td>151,500</td>
<td>101,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>606,000</td>
<td>404,000</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>454,500</td>
<td>303,000</td>
</tr>
<tr>
<td>H-1</td>
<td>NS</td>
<td>10,500</td>
<td>10,500</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>10,500</td>
<td>10,500</td>
</tr>
<tr>
<td>H-2</td>
<td>NS</td>
<td>25,500</td>
<td>25,500</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-3</td>
<td>NS</td>
<td>72,000</td>
<td>54,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>288,000</td>
<td>216,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>216,000</td>
<td>162,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>72,000</td>
<td>54,000</td>
</tr>
<tr>
<td>H-4</td>
<td>NS</td>
<td>72,000</td>
<td>54,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>288,000</td>
<td>216,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>216,000</td>
<td>162,000</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>72,000</td>
<td>54,000</td>
</tr>
<tr>
<td>I2/I-2.1</td>
<td>NS</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>I-3</td>
<td>NS</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>SM (with height increase)</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>I-4</td>
<td>NS</td>
<td>76,500</td>
<td>51,000</td>
</tr>
<tr>
<td></td>
<td>S1</td>
<td>306,000</td>
<td>204,000</td>
</tr>
<tr>
<td></td>
<td>SM (without height increase)</td>
<td>SM (with height increase)</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------------------------</td>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>229,500</td>
<td>153,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,500</td>
<td>51,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,500</td>
<td>25,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,500</td>
<td>25,500</td>
<td></td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>60,000</td>
<td>37,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36,000</td>
<td>36,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td><strong>R-1</strong></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102,500</td>
<td>82,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td><strong>R-2</strong></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102,500</td>
<td>82,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td><strong>R-2.1</strong></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>72,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>162,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td><strong>R-2.2</strong></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54,000</td>
<td>NP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td><strong>R-3/R-3.1</strong></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102,500</td>
<td>82,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102,500</td>
<td>82,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102,500</td>
<td>82,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>184,500</td>
<td>123,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,875</td>
<td>61,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,625</td>
<td>20,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NS</td>
<td>S13R</td>
<td>S1</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>R-4b</td>
<td>61,500</td>
<td>41,000</td>
<td>25,625</td>
</tr>
<tr>
<td></td>
<td>246,000</td>
<td>164,000</td>
<td>102,500</td>
</tr>
<tr>
<td></td>
<td>164,500</td>
<td>123,000</td>
<td>76,875</td>
</tr>
<tr>
<td></td>
<td>61,500</td>
<td>41,000</td>
<td>25,625</td>
</tr>
<tr>
<td>S-1</td>
<td>76,500</td>
<td>51,000</td>
<td>31,875</td>
</tr>
<tr>
<td></td>
<td>306,000</td>
<td>204,000</td>
<td>127,500</td>
</tr>
<tr>
<td></td>
<td>229,500</td>
<td>153,000</td>
<td>95,625</td>
</tr>
<tr>
<td>SM</td>
<td>115,500</td>
<td>77,000</td>
<td>48,125</td>
</tr>
<tr>
<td></td>
<td>462,000</td>
<td>308,000</td>
<td>192,500</td>
</tr>
<tr>
<td></td>
<td>346,500</td>
<td>231,000</td>
<td>144,375</td>
</tr>
<tr>
<td>S-2</td>
<td>54,000</td>
<td>36,000</td>
<td>22,500</td>
</tr>
<tr>
<td></td>
<td>216,000</td>
<td>144,000</td>
<td>90,000</td>
</tr>
<tr>
<td></td>
<td>162,000</td>
<td>108,000</td>
<td>67,500</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m².
UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. (footnotes remain unchanged)

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. Mass timber elements serving as fire barriers or horizontal assemblies to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an approved thermal barrier consisting of a minimum of 1/2 inch (12.7 mm) gypsum board 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.

509.4.1.1 Type IV-B and IV-C construction. Where Table 509 specifies a fire-resistance-rated separation, mass timber elements serving as fire barriers or a horizontal assembly in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of a minimum
of ½ inch (12.7 mm) gypsum board 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.

### TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

<table>
<thead>
<tr>
<th>BUILDING ELEMENT</th>
<th>TYPE IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Primary structural framef (see Section 202)</td>
<td>3a</td>
</tr>
<tr>
<td>Bearing walls</td>
<td></td>
</tr>
<tr>
<td>Exterior e, f</td>
<td>3</td>
</tr>
<tr>
<td>Interior</td>
<td>3</td>
</tr>
<tr>
<td>Nonbearing walls and partitions</td>
<td></td>
</tr>
<tr>
<td>Exterior</td>
<td>See Table 602</td>
</tr>
<tr>
<td>Nonbearing walls and partitions Interior d</td>
<td>0</td>
</tr>
<tr>
<td>Floor construction and associated secondary members (see Section 202)</td>
<td>2</td>
</tr>
<tr>
<td>Roof construction and associated secondary members (see Section 202)</td>
<td>1½</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. Roof supports: ...

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed for roof construction including primary structural frame members where a 1-hour or less fire-resistance rating is required.

g. Heavy timber bearing walls supporting more than two floors or more than a floor and a roof shall have a fire resistance rating of not less than 1 hour.

### TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCEa, d, g
For SI: 1 foot = 304.8 mm.
a. Load-bearing exterior walls …

### 602.4 Type IV

Type IV construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated wood, heavy timber (HT) or structural composite lumber (SCL) without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL), and cross-laminated timber and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.1 or 602.4.2 shall be permitted. Interior walls and partitions not less than 1-hour fire-resistance rating or heavy timber complying with Section 2304.11.2.2 shall be permitted. The building elements are mass timber or noncombustible materials and have fire resistance ratings in accordance with Table 301. Mass timber elements shall meet the fire resistance rating requirements of this section based on either the fire resistance rating of the noncombustible protection, the mass timber, or a combination of both and shall be determined in accordance with Section 703.2 or 703.3. The minimum dimensions and permitted materials for building elements shall comply with the provisions of this section and Section 2304.11. Mass timber elements of Types IV A, IV B and IV C construction shall be protected with noncombustible protection applied directly to the mass timber in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the noncombustible protection shall be determined in accordance with Section 703.8 and comply with 722.7.

Cross-laminated timber shall be labeled as conforming to PRG 320-18 as referenced in Section 2303.1.4.
Exterior load-bearing walls and non-load-bearing walls shall be mass timber construction, or shall be of noncombustible construction.

Exception: Exterior load-bearing walls and non-load-bearing walls of Type IV-HT Construction in accordance with Section 602.4.4.

The interior building elements, including non-load-bearing walls and partitions, shall be of mass timber construction or of noncombustible construction.

Exception: Interior building elements and non-load-bearing walls and partitions of Type IV-HT Construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4.

Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, B, and C, construction with an occupied floor located more than 75 feet above the lowest level of building access, up to and including 12 stories or 180 feet above grade plane, mass timber interior exit and elevator hoist-way enclosures shall be protected in accordance with Section 602.4.1.2. In buildings, greater than 12 stories or 180 feet above grade plane, interior exit and elevator hoist-way enclosures shall be constructed of non-combustible materials.

602.4.1 Type IV-A. Building elements in Type IV-A construction shall be protected in accordance with Sections 602.4.1.1 through 602.4.1.6. The required fire resistance rating of noncombustible elements and protected mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.1.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.1.2 Interior protection. Interior faces of all mass timber elements, including the inside faces of exterior mass timber walls and mass timber
roofs, shall be protected with materials complying with Section 703.5.

602.4.1.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

602.4.1.3 Floors. The floor assemblies shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with 602.4.1.2.

602.4.1.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.1.2. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.1.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the California Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

602.4.1.6 Shafts. Shafts shall be permitted in accordance with Sections 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

602.4.2 Type IV-B. Building elements in Type IV-B construction shall be protected in accordance with Sections 602.4.2.1 through 602.4.2.6. The required fire resistance rating of noncombustible elements or mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.2.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with non-combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354, and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as
determined in accordance with ASTM E 84 or UL723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.2.2 Interior protection. Interior faces of all mass timber elements, including the inside face of exterior mass timber walls and mass timber roofs, shall be protected, as required by this section, with materials complying with Section 703.5.

602.4.2.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

602.4.2.2.2 Protected area. All interior faces of all mass timber elements shall be protected in accordance with Section 602.4.2.2.1, including the inside face of exterior mass timber walls and mass timber roofs.

Exceptions: Unprotected portions of mass timber ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20% of the floor area in any dwelling unit or fire area; or

2. Unprotected portions of mass timber walls, including attached columns, shall be permitted and shall be limited to an area equal to 40% of the floor area in any dwelling unit or fire area; or

3. Unprotected portions of both walls and ceilings of mass timber, including attached columns and beams, in any dwelling unit or fire area shall be permitted in accordance with section 602.4.2.2.3.

4. Mass timber columns and beams which are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

602.4.2.2.3 Mixed unprotected areas. In each dwelling unit or fire area, where both portions of ceilings and portions of walls are
unprotected, the total allowable unprotected area shall be determined in accordance with Equation 6-1.

\[(\text{Utc/}U\text{ac}) + (\text{Utw/}U\text{aw}) \leq 1 \text{ (Equation 6-1)}\]

where:

\(\text{Utc} = \text{Total unprotected mass timber ceiling areas}\)

\(\text{Uac} = \text{Allowable unprotected mass timber ceiling area conforming to Section 602.4.2.2.2, Exception 1}\)

\(\text{Utw} = \text{Total unprotected mass timber wall areas}\)

\(\text{Uaw} = \text{Allowable unprotected mass timber wall area conforming to Section 602.4.2.2.2, Exception 2}\)

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each dwelling unit or fire area, unprotected portions of mass timber walls and ceilings shall be not less than 15 feet from unprotected portions of other walls and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls measured horizontally along the floor.

602.4.2.3 Floors. The floor assembly shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

602.4.2.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with 602.4.2.2 except, in non-occupiable spaces, they shall be treated as a concealed space with no portion left unprotected. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.2.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the California Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

602.4.2.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.
602.4.3 Type IV-C. Building elements in Type IV-C construction shall be protected in accordance with Sections 602.4.3.1 through 602.4.3.6. The required fire resistance rating of building elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.3.1 Exterior protection. The exterior side of walls of combustible construction shall be protected with non-combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m², and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL723. The ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.3.2 Interior protection. Mass timber elements are permitted to be unprotected.

602.4.3.3 Floors. Floor finishes in accordance with Section 804 shall be permitted on top of the floor construction.

602.4.3.4 Roofs. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.3.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the California Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1.

602.4.3.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Shafts and elevator hoist-way and interior exit stairway enclosures shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1, on both the inside of the shaft and the outside of the shaft.

602.4.4 Type IV-HT. 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 wood, laminated heavy timber or structural composite lumber (SCL), without concealed spaces or with concealed spaces complying with Section 602.4.4.4. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL) and cross laminated
timber (CLT) and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted. Interior walls and partitions not less than one hour fire resistance rating or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

602.4.4.1 Fire-retardant-treated wood in exterior walls. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.

602.4.4.2 Cross-laminated timber in exterior walls. Cross-laminated timber not less than 4 inches (102 mm) in thickness complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less. The exterior surface of the cross-laminated timber and heavy timber elements shall be protected by one of the following:

1. Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than 15/32 inch (12 mm) thick;
2. Gypsum board not less than 1/2 inch (12.7 mm) thick; or
3. A noncombustible material.

602.4.3 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 complying with Section 2304.11 shall be permitted to be used externally.

602.4.4 Concealed spaces. Concealed spaces shall not contain combustible materials other than building elements and electrical, mechanical, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the California Mechanical Code. Concealed spaces shall comply with applicable provisions of Section 718. Concealed Spaces shall be protected in accordance with one or more of the following:

1. The building shall be sprinklered throughout in accordance with Section 903.3.1.1 and automatic sprinklers shall also be provided in the concealed space.
2. The concealed space shall be completely filled with noncombustible insulation.
3. Surfaces within the concealed space shall be fully sheathed with not less than 5/8-inch Type X gypsum board.

Exception: concealed spaces within interior walls and partitions with a one hour or greater fire resistance rating complying with Section 2304.11.2.2, shall not require additional protection.

703.8 Determination of noncombustible protection time contribution. The time, in minutes, contributed to the fire resistance rating by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established through a comparison of assemblies tested using procedures set forth in ASTM E 119 or UL 263. The test assemblies shall be identical in construction, loading, and materials, other than the noncombustible protection. The two test assemblies shall be tested to the same criteria of structural failure.

1. Test Assembly 1 shall be without protection.

2. Test Assembly 2 shall include the representative noncombustible protection. The protection shall be fully defined in terms of configuration details, attachment details, joint sealing details, accessories and all other relevant details.

The noncombustible protection time contribution shall be determined by subtracting the fire resistance time, in minutes, of Test Assembly 1 from the fire resistance time, in minutes, of Test Assembly 2.

703.9 Sealing of adjacent mass timber elements. In buildings of Type IVA, IVB, and IVC construction, sealant or adhesive shall be provided to resist the passage of air in the following locations:

1. At abutting edges and intersections of mass timber building elements required to be fire resistance-rated

2. At abutting intersections of mass timber building elements and building elements of other materials where both are required to be fire resistance-rated.

Sealants shall meet the requirements of ASTM C920. Adhesives shall meet the requirements of ASTM D3498.

Exception: Sealants or adhesives need not be provided where they are not a required component of a tested fire resistance-rated assembly.
718.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. (existing code language remain unchanged)

9. Mass timber complying with Section 2304.11.

722.7 Fire resistance rating of mass timber. The required fire resistance of mass timber elements in Section 602.4 shall be determined in accordance with Section 703.2 or Section 703.3. The fire resistance rating of building elements shall be as required in Tables 601 and 602 and as specified elsewhere in this code. The fire resistance rating of the mass timber elements shall consist of the fire resistance of the unprotected element added to the protection time of the noncombustible protection.

722.7.1 Minimum required protection. Where required by Sections 602.4.1 through 602.4.3, noncombustible protection shall be provided for mass timber building elements in accordance with Table 722.7.1(1). The rating, in minutes, contributed by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established in accordance with Section 703.8. The protection contributions indicated in Table 722.7.1(2) shall be deemed to comply with this requirement when installed and fastened in accordance with Section 722.7.2.

**TABLE 722.7.1(1)**
PROTECTION REQUIRED FROM NONCOMBUSTIBLE COVERING MATERIAL

<table>
<thead>
<tr>
<th>Required Fire Resistance Rating of Building Element per Tables 601 and 602 (hours)</th>
<th>Minimum Protection Required from noncombustible Protection (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hr.</td>
<td>40</td>
</tr>
<tr>
<td>2 hr.</td>
<td>80</td>
</tr>
<tr>
<td>3 hr. or more</td>
<td>120</td>
</tr>
</tbody>
</table>

**TABLE 722.7.1(2)**
PROTECTION PROVIDED BY NONCOMBUSTIBLE COVERING MATERIAL
<table>
<thead>
<tr>
<th>Noncombustible Protection</th>
<th>Protection Contribution (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2-inch Type X Gypsum Board</td>
<td>25</td>
</tr>
<tr>
<td>5/8-inch Type X Gypsum Board</td>
<td>40</td>
</tr>
</tbody>
</table>

**722.7.2 Installation of gypsum board noncombustible protection.** Gypsum board complying with Table 722.7.1(2) shall be installed in accordance with this section.

**722.7.2.1 Interior surfaces.** Layers of Type X gypsum board serving as noncombustible protection for interior surfaces of wall and ceiling assemblies determined in accordance with Table 722.7.1(1) shall be installed in accordance with the following:

1. Each layer shall be attached with Type S drywall screws of sufficient length to penetrate the mass timber at least 1 inch when driven flush with the paper surface of the gypsum board.

   **Exception:** The third layer, where determined necessary by Section 722.7, shall be permitted to be attached with 1 inch #6 Type S drywall screws to furring channels in accordance with ASTM C645.

2. Screws for attaching the base layer shall be 12 inches on center in both directions.

3. Screws for each layer after the base layer shall be 12 inches on center in both directions and offset from the screws of the previous layers by 4 inches in both directions.

4. All panel edges of any layer shall be offset 18 inches from those of the previous layer.

5. All panel edges shall be attached with screws sized and offset as in items 1 through 4 above and placed at least 1 inch but not more than 2 inches from the panel edge.
6. All panels installed at wall-to-ceiling intersections shall be installed such that ceiling panels are installed first and the wall panels are installed after the ceiling panel has been installed and is fitted tight to the ceiling panel. Where multiple layers are required, each layer shall repeat this process.

7. All panels installed at a wall-to-wall intersection shall be installed such that the panels covering an exterior wall or a wall with a greater fire resistance rating shall be installed first and the panels covering the other wall shall be fitted tight to the panel covering the first wall. Where multiple layers are required, each layer shall repeat this process.

8. Panel edges of the face layer shall be taped and finished with joint compound. Fastener heads shall be covered with joint compound.

9. Panel edges protecting mass timber elements adjacent to unprotected mass timber elements in accordance with Section 602.4.2.2 shall be covered with 1 1/4-inch metal corner bead and finished with joint compound.

722.7.2.2 Exterior surfaces. Layers of Type X gypsum board serving as noncombustible protection for the outside of the exterior heavy timber walls determined in accordance with Table 722.7.1(1) shall be fastened 12 inches on center each way and 6 inches on center at all joints or ends. All panel edges shall be attached with fasteners located at least 1 inch but not more than 2 inches from the panel edge. Fasteners shall comply with one of the following:

1. Galvanized nails of minimum 12 Gage with a 7/16-inch head of sufficient length to penetrate the mass timber a minimum of 1 inch.

2. Screws which comply with ASTM C1002 (Type S, Type W, or Type G) of sufficient length to penetrate the mass timber a minimum of 1 inch.

1705.5.3 Mass timber construction. Special inspections of Mass Timber elements in Types IV-A, IV-B and IV-C construction shall be in accordance with Table 1705.5.3.

<table>
<thead>
<tr>
<th>TABLE 1705.5.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>REQUIRED SPECIAL INSPECTIONS OF MASS TIMBER CONSTRUCTION</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1. Inspection of anchorage and connections of mass timber construction to timber deep foundation systems.</td>
</tr>
<tr>
<td>2. Inspect erection of mass timber construction</td>
</tr>
<tr>
<td>3. Inspection of connections where installation methods are required to meet design loads</td>
</tr>
<tr>
<td>3.1 Threaded fasteners</td>
</tr>
<tr>
<td>3.1.1 Verify use of proper installation equipment</td>
</tr>
<tr>
<td>3.1.2 Verify use of pre-drilled holes where required</td>
</tr>
<tr>
<td>3.1.3 Inspect screws, including diameter, length, head type, spacing, installation angle, and depth</td>
</tr>
<tr>
<td>3.2 Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads</td>
</tr>
<tr>
<td>3.3 Adhesive anchors not defined in 3.2</td>
</tr>
<tr>
<td>3.4 Bolted connections</td>
</tr>
<tr>
<td>3.5 Concealed connections</td>
</tr>
</tbody>
</table>

1705.11.1 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main wind force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of elements of the main wind force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

**Exception:** Special inspections are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the main wind force-resisting system, where the lateral resistance is provided by the structural sheathing and the specified fastener spacing at panel edges is more than 4 inches (102 mm) on center.

1705.11.2 Cold-formed steel light-frame construction. Periodic special inspection is required for welding operations of elements of the main wind force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of elements of the main wind force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.
Exception: Special inspections are not required for cold-formed steel light-frame shear walls and diaphragms, including screwing, bolting, anchoring and other fastening to components of the wind force resisting system, where either of the following applies:
   1. The sheathing is gypsum board or fiberboard.
   2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the specified fastener spacing of at the sheathing panel or sheet edges is more than 4 inches (102 mm) on center (o.c.).

1705.12.2 Structural wood. For the seismic force-resisting systems of structures assigned to Seismic Design Category C, D, E or F:
   1. Continuous special inspection shall be required during field gluing operations of elements of the seismic force-resisting system.

   2. Periodic special inspection shall be required for nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

Exception: Special inspections are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the seismic force-resisting system, where the lateral resistance is provided by structural sheathing, and the specified fastener spacing of at the sheathing panel edges is more than 4 inches (102 mm) on center.

1705.12.3 Cold-formed steel light-frame construction. For the seismic force-resisting systems of structures assigned to Seismic Design Category C, D, E or F, periodic special inspection shall be required for both:
   1. Welding operations of elements of the seismic force-resisting system.

   2. Screw attachment, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: Special inspections are not required for cold-formed steel light-frame shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the seismic force-resisting system, where either of the following applies:
   1. The sheathing is gypsum board or fiberboard.

   2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the specified fastener spacing of at the sheathing panel or sheet edge is more than 4 inches (102 mm) on center.
1705.20 Sealing of mass timber. Period special inspections of sealants or adhesives shall be conducted where sealant or adhesive required by Section 703.9 is applied to mass timber building elements as designated in the approved construction documents.

2304.10.1.2 Connection fire resistance rating. Fire resistance ratings for connections in Type IV-A IV-B, or IV-C construction shall be determined by one of the following:

1. Testing in accordance with Section 703.2 where the connection is part of the fire resistance test.

2. Engineering analysis that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (139°C) and a maximum temperature rise of 325°F (181°C) for a time corresponding to the required fire resistance rating of the structural element being connected. For the purposes of this analysis the connection includes connectors fasteners and portions of wood members included in the structural design of the connection.

2304.11.3 Floors. Floors shall be without concealed spaces or with concealed spaces complying with Section 602.4.4.4. Wood floors shall be constructed in accordance with Section 2304.11.3.1 or 2304.11.3.2.

2304.11.4 Roof decks. Roofs shall be without concealed spaces or with concealed spaces complying with Section 602.4.4.4. and Roof decks shall be constructed in accordance with Section 2304.11.4.1 or 2304.11.4.2. Other types of decking shall be an alternative that provides equivalent fire resistance and structural properties. Where supported by a wall, roof decks shall be anchored to walls to resist forces determined in accordance with Chapter 16. Such anchors shall consist of steel bolts, lags, screws or approved hardware of sufficient strength to resist prescribed forces.

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type IV-HT construction. Other membrane structures shall be classified as Type V construction.

Exception: Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria
of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Type IIB, III, IV-HT and V construction, provided that the membrane is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

[New standard Chapter 35]

**ASTM**


**D102.2.5 Structural fire rating.** Walls, floors, roofs and their supporting structural members shall be not less than 1-hour fire-resistance-rated construction.

Exceptions:

1. Buildings of Type IV-HT construction.

2. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

3. Automobile parking structures.

4. Buildings surrounded on all sides by a permanently open space of not less than 30 feet (9144 mm).

5. Partitions complying with Section 603.1, Item 11.

**Item 9. Tall Wood Building CFC**

TALL WOOD AND HEAVY TIMBER 2019 INTERVENING PROPOSALS
CFC:
701.6, 914.3.1.2, 3308.9

Associated CBC:
110.3.5 (New), 202, 403.3.2, TABLE 504.3, TABLE 504.4, TABLE 506.2, 508.4.4.1, 509.4.1.1 (New), TABLE 601, TABLE 602, 602.4, 602.4.1 (New), 602.4.1.1 (New), 602.4.1.2 (New), 602.4.1.2.1 (New), 602.4.1.3 (New), 602.4.1.4 (New), 602.4.1.5 (New), 602.4.1.6 (New), 602.4.2, 602.4.2.1 (New), 602.4.2.2 (New), 602.4.2.2.1 (New), 602.4.2.2.2 (New), 602.4.2.2.3 (New), 602.4.2.2.4 (New), 602.4.2.3 (New), 602.4.2.4 (New), 602.4.2.5 (New), 602.4.2.6 (New), 602.4.3, 602.4.3.1 (New), 602.4.3.2 (New),
**701.6 Owner's responsibility.** The owner shall maintain an inventory of all required fire-resistance-rated construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the California Building Code. Such construction shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

**914.3.1.2 Water supply to required fire pumps.** In all buildings having an occupied floor that are is more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, required fire pumps shall be supplied by connections to not 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.

**Exception:** Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.

**3308.9 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction.** Buildings of Types IV-A, IV-B, and IV-C construction designed to be greater than six stories above grade plane shall comply with the following requirements during construction unless otherwise approved by the fire code official.

1. Standpipes shall be provided in accordance with Section 3313.

2. A water supply for fire department operations, as approved by the fire code official and the fire chief.

3. Where building construction exceeds six stories above grade plane, at least one layer of noncombustible protection where required by Section 602.4 of the California Building Code shall be installed on all building elements more than 4
floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.

**Exception:** Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

4. Where building construction exceeds six stories above grade plane required exterior wall coverings shall be installed on all floor levels more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.

**Exception:** Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

**Item 10. Escape Room (brought in from the IBC) – CBC**

**Puzzle / Escape Room**

**CBC:**

Table of Contents, 202, Title 411, 411.1, 411.2, 411.3, 411.4, 411.5, 411.6, 411.6.1, 411.7, TABLE 903.2.11.6, 907.2.11, 907.2.11.2, 907.2.11.3, 914.7, 914.7.1, 914.7.2, TABLE 1017.2, INDEX

Associated CFC:

202, TABLE 903.2.11.6, 907.2.11, 907.2.11.2, 907.2.11.3, 914.7, 914.7.1, 914.7.2, TABLE 1017.2, 3103.3.1, O103.1, INDEX

[Revise Table of Contents]

411 Special Amusement Buildings Areas

**SECTION 202 DEFINITIONS**

[Add new definition]

**PUZZLE ROOM** A **puzzle room** is a type of special amusement area in which occupants are encouraged to solve a challenge to escape from a room or series of rooms.

**[BG] SPECIAL AMUSEMENT BUILDING AREA.** A special amusement building **area** 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 is arranged in a manner that:

1. Makes the means of egress path that is not readily apparent due to visual or audio distractions.

2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

SECTION 411
SPECIAL AMUSEMENT BUILDINGS AREAS

411.1 General. Special amusement buildings areas having an occupant load of 50 or more shall comply with the requirements for the appropriate Group A occupancy and Sections 411.1 through 411.7. Special amusement buildings areas having an occupant load of less than 50 shall comply with the requirements for a Group B occupancy and Sections 411.1 through 411.7. 411.8. 411.8.

Exception: Special amusement buildings areas 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.

[F] 411.2 Automatic fire detection. Special amusement buildings shall be equipped with an automatic fire detection system in accordance with Section 907.

[F] 411.2 Automatic sprinkler system. Buildings containing special amusement areas shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement area 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 area is less than 1,000 square feet (93 m²) and the exit access travel distance from any point in the special amusement area to an exit is less than 50 feet (15 240 mm).

411.3 Fire alarm system. Buildings containing special amusement areas shall be equipped with an automatic smoke detection system in accordance with 907.2.11.

[F] 411.4 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 907.2.11.

[F] 411.5 411.4 Emergency voice/alarm communications system. An emergency voice/alarm communications system shall be provided in accordance with Sections 907.2.11 and 907.5.2.2, is permitted to serve as a public address system and shall be audible throughout the entire special amusement building area.
411.5 Puzzle room exiting. Puzzle room exiting shall comply with one of the following:
1. Exiting in accordance with Chapter 10.
2. An alternative design approved by the fire official.

411.6 Exit marking. Exit signs shall be installed at the required exit or exit access doorways of serving special amusement buildings areas in accordance with this section and Section 1013. Approved directional exit markings shall 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 1013.5, 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 smoke detection system and the automatic sprinkler system in accordance with Section 907.2.11.

411.7 Interior finish. The interior finish in special amusement areas shall be Class A in accordance with Section 803.1.

**TABLE 903.2.11.6**
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>411.42</td>
<td>Special amusement buildings</td>
</tr>
</tbody>
</table>

907.2.11 Special amusement buildings areas. An automatic smoke detection system shall be provided in special amusement buildings areas in accordance with Sections 907.2.11.1 through 907.2.11.3.

907.2.11.2 System response.
1. (1.-3. Remain unchanged)
4. Activate a prerecorded message, audible throughout the special amusement building area, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.

907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is 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 area.

914.7 Special amusement buildings areas. Special amusement buildings areas shall comply with Sections 914.7.1 and 914.7.2.
914.7.1 Automatic sprinkler system. Special Buildings containing special amusement buildings areas shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement building area 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 area is less than 1,000 square feet (93 m²) and the exit access travel distance from any point in the special amusement area to an exit is less than 50 feet (15 240 mm).

914.7.2 Automatic smoke detection. Special amusement buildings areas shall be equipped with an automatic smoke detection system in accordance with Section 907.2.11.

### TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE

(Table unchanged)
For SI: 1 foot = 304.8 mm.

<table>
<thead>
<tr>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. See the following sections for modifications to exit access travel distance requirements:</td>
</tr>
<tr>
<td>Section 411.3 411.2: For the distance limitation in special amusement buildings areas.</td>
</tr>
</tbody>
</table>

[Revise INDEX]
Group-specific provisions
Special amusement buildings areas

**EXIT SIGNS**
Special amusement buildings areas

**FIRE ALARM AND SMOKE DETECTION SYSTEMS**
Special amusement buildings areas
411.23, 411.45, 411.6, 907.2.4211, 914.7.2

**MEANS OF EGRESS**
Special amusement areas
411.4, 1017.2

**PUBLIC ADDRESS SYSTEM**
(see EMERGENCY COMMUNICATIONS)
Special amusement buildings
411.54

**RECREATIONAL FACILITIES**
Special amusement buildings areas
(see AMUSEMENT BUILDINGS, SPECIAL)
SMOKE DETECTORS
Special amusement buildings areas
411.43, 411.6, 907.2.11, 914.7.2

SPRINKLER SYSTEM, REQUIRED
Special amusement buildings areas
411.32, 903.2.11.6, 914.7

TRAVEL DISTANCE
Special amusement building area
411.32, 1017.2

Item 11. Escape Room (brought in from the IFC) – CFC

Puzzle / Escape Room
CFC:
202, TABLE 903.2.11.6, 907.2.11, 907.2.11.2, 907.2.11.3, 914.7, 914.7.1, 914.7.2,
TABLE 1017.2, 3103.3.1, O103.1, INDEX

Associated CBC:
Table of Contents, 202, Title 411, 411.1, 411.2, 411.3, 411.4, 411.5, 411.6, 411.6.1,
411.7, TABLE 903.2.11.6, 907.2.11, 907.2.11.2, 907.2.11.3, 914.7, 914.7.1, 914.7.2,
TABLE 1017.2, INDEX;

105.6.2 Amusement buildings. An operational permit is required to operate a special
amusement building area.

[Add new definition]

**PUZZLE ROOM** A puzzle room is a type of special amusement area in which occupants
are encouraged to solve a challenge to escape from a room or series of rooms.

**SPECIAL AMUSEMENT BUILDING AREA.** A special amusement building area 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 is
arranged in a manner that:

1. Makes the means of egress path that is not readily apparent due to visual or
   audio distractions.

2. Intentionally confounds identification of the means of egress path.
3. Otherwise makes the means of egress path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

### TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>914.7.1</td>
<td>Special amusement buildings</td>
</tr>
</tbody>
</table>

907.2.11 Special amusement buildings areas. An automatic smoke detection system shall be provided in special amusement buildings areas in accordance with Sections 907.2.11.1 through 907.2.11.3.

907.2.11.2 System response.

1. (1.-3. Remain unchanged)

4. Activate a prerecorded message, audible throughout the special amusement building area, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinctive from other sounds used during normal operation.

907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is 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 area.

914.7 Special amusement buildings areas. Special amusement buildings areas shall comply with Sections 914.7.1 and 914.7.2.

914.7.1 Automatic sprinkler system. Special Buildings containing special amusement buildings areas shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement building area 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 area is less than 1,000 square feet (93 m²) and the exit access travel distance from any point in the special amusement area to an exit is less than 50 feet (15 240 mm).

914.7.2 Automatic smoke detection. Special amusement buildings areas shall be equipped with an automatic smoke detection system in accordance with Section 907.2.11.

### TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE a

(Table unchanged)
For SI: 1 foot = 304.8 mm.
a. See the following sections for modifications to exit access travel distance requirements:

Section 411.3 411.2 of the California Building Code: For the distance limitation in special amusement buildings areas.

3103.3.1 Special amusement building area. Tents and other membrane structures erected as a special amusement building area shall be equipped with an automatic sprinkler system in accordance with Section 411.3 of the California Building Code.

O103.1 Allowable structures. Haunted houses, ghost walks, and similar amusement uses shall only be located in structures that comply with the provisions for Special Amusement Buildings Areas in accordance with the California Building Code.

AMUSEMENT BUILDING, SPECIAL
(see SPECIAL AMUSEMENT BUILDING AREA)
AMUSEMENT PARK STRUCTURES
(Assembly, Group A-5)

Special amusement buildings areas

SPECIAL AMUSEMENT BUILDING AREA


ESS 2019 INTERVENING PROPOSALS
CBC:
306.2, TABLE 509, 707.4, TABLE 716.1(2), TABLE 716.1(3), 716.2.5.4.1 (New), 716.3.2.1.1.1 (New)

[Add an additional example to Group F-1 in alphabetical order, after Electronics and before Engines]

306.2 Moderate-hazard factory industrial, Group F-1.
(other examples remain unchanged)
Energy storage systems (ESS) in dedicated use buildings

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS a, h

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>CLASS</th>
<th>EXPLOSION CONTROL METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Barricade construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explosion (deflagration) venting or explosion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(deflagration) prevention systems</td>
</tr>
</tbody>
</table>

Hazard Category
Special Uses
**TABLE 509**

INCIDENTAL USES

<table>
<thead>
<tr>
<th>ROOM OR AREA</th>
<th>SEPARATION AND/OR PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the California Fire Code</td>
<td>1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.</td>
</tr>
</tbody>
</table>

**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.

**Exceptions:**

1. Exterior walls required to be fire-resistance rated in accordance with Section 1021 for exterior egress balconies, Section 1023.7 for interior exit stairways and ramps and Section 1027.6 for exterior exit stairways and ramp.

2. Exterior walls required to be fire-resistance rated in accordance with Section 1206 of the California Fire Code for enclosure of energy storage systems.

**TABLE 716.1(2)**

OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

(partial table shown to indicate where proposed changes occur)

<table>
<thead>
<tr>
<th>TYPE OF ASSEMBLY</th>
<th>REQUIRED WALL ASSEMBLY RATING (hours)</th>
<th>MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)</th>
<th>FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire protection</td>
<td></td>
<td></td>
<td>D-H</td>
</tr>
<tr>
<td>Other fire barriers</td>
<td>1</td>
<td>¾ d</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 716.1(3)
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS
(partial table shown to indicate where proposed changes occur)

<table>
<thead>
<tr>
<th>TYPE OF WALL ASSEMBLY</th>
<th>MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)</th>
<th>FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior walls</td>
<td>Fire protection 2 1 1/2</td>
<td>Fire protection 2</td>
</tr>
<tr>
<td>Fire protection</td>
<td>3 3/4</td>
<td></td>
</tr>
</tbody>
</table>

(footnotes a. through e. unchanged)

**f.** Fire-protection-rated glazing is not permitted for fire barriers required by Section 1206 of the California Fire Code to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3 shall be permitted.

**716.3.2.1 Interior fire window assemblies.** (no code change proposal, section title included for reader ease)

**716.3.2.1.1 Where 3/4-hour-fire-protection window assemblies permitted.** (no code change proposal, section title included for reader ease)
716.3.2.1.1.1 Energy storage system separation. Fire-protection-rated glazing is not permitted for use in fire window assemblies in fire barriers required by Section 1206 of the California Fire Code to enclose energy storage systems.

<table>
<thead>
<tr>
<th>TABLE 903.2.11.6</th>
<th>ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SECTION</td>
<td>SUBJECT</td>
</tr>
<tr>
<td>California Fire Code Section 1206</td>
<td>Stationary and mobile energy storage systems</td>
</tr>
</tbody>
</table>

CHAPTER 35
REFERENCED STANDARDS

NFPA
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

68—13:
Standard on Explosion Protection by Deflagration Venting

ESS 2019 INTERVENING PROPOSALS
CFC:

SECTION 105
PERMITS

105.6 Required operational permits. The fire code official is authorized to issue operational permits for the operations set forth in Sections 105.6.1 through 105.6.502.

105.6.52 Energy storage systems. An operational permit is required for stationary and mobile energy storage systems regulated by Section 1206.

[A] 105.7.2 Battery systems. A construction permit is required to install stationary storage battery systems regulated by Section 1206.2. Energy storage systems. A construction permit is required to install energy storage systems regulated by Section 1206.

[A] 105.7.3 Capacitor energy storage systems. A construction permit is required to install capacitor energy storage systems regulated by Section 1206.3. Reserved.

SECTION 202
GENERAL DEFINITIONS

BATTERY TYPES.
**Lead-acid battery.** A storage battery that is comprised of lead electrodes immersed in a *solution of water and* sulphuric acid electrolyte.

**Nickel-cadmium (Ni-Cd) battery.** An alkaline storage battery in which the positive active material is nickel oxide, the negative contains cadmium and the electrolyte is a *solution of water and* potassium hydroxide.

**CAPACITOR ARRAY.** An arrangement of individual capacitor modules in close proximity to each other, mounted on storage racks or in cabinets or other enclosures.

**CAPACITOR ENERGY STORAGE SYSTEM.** A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls and associated electrical equipment designed to provide electrical power to a building or facility. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

**Preengineered capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that are produced in a factory, designed to comprise the system when assembled on the job site.

**Prepackaged capacitor energy storage system.** A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that is factory assembled and then shipped as a complete unit for installation at the job site.

**ENERGY STORAGE MANAGEMENT SYSTEMS.** An electronic system that protects stationary *energy storage batteries systems* from operating outside their safe operating parameters, and generates an alarm and trouble signal for off normal conditions *disconnects electrical power to the ESS or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.*

**ENERGY STORAGE SYSTEM (ESS).** One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

**ENERGY STORAGE SYSTEM CABINET.** A cabinet containing components of the energy storage system that is included in the UL 9540 listing for the system. Personnel are not able to enter the enclosure, other than reaching in to access components for maintenance purposes.

**ENERGY STORAGE SYSTEM COMMISSIONING.** A systematic process that provides documented confirmation that an energy storage system functions according to the intended design criteria and complies with applicable code requirements.

**ENERGY STORAGE SYSTEM DECOMMISSIONING.** A systematic process that provides documentation and procedures that allow an energy storage system to be
safely de-energized, disassembled, readied for shipment or storage, and removed from the premise in accordance with applicable code requirements.

**ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.** An energy storage system that stores energy and produces electricity using chemical reactions. It includes, among others, battery ESS and capacitor ESS.

**ENERGY STORAGE SYSTEM, MOBILE.** An energy storage system capable of being moved and utilized for temporary energy storage applications, and not installed as fixed or stationary electrical equipment. The system can include integral wheels for transportation, or be loaded on a trailer and unloaded for charging, storage and deployment.

**ENERGY STORAGE SYSTEM, STATIONARY.** An energy storage system installed as fixed or stationary electrical equipment in a permanent location.

**ENERGY STORAGE SYSTEM, WALK-IN UNIT.** A pre-fabricated building that contains energy storage systems. It includes doors that provide walk-in access for personnel to maintain, test and service the equipment, and is typically used in outdoor and mobile ESS applications.

**STATIONARY BATTERY ARRAY.** An arrangement of individual stationary storage batteries in close proximity to each other, mounted on storage racks or in modules, battery cabinets or other enclosures.

[BG] Factory Industrial F-1 Moderate-hazard occupancy.
[Add an additional example to Group F-1 in alphabetical order, after Electronics and before Engines. Other examples remain unchanged]

Energy storage systems (ESS) in dedicated use buildings

**SECTION 903**
**AUTOMATIC SPRINKLER SYSTEMS**

**TABLE 903.2.11.6**
**ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1206.7, Table 1206.8, Table 1206.9, Table 1206.10</td>
<td>Stationary and mobile energy storage systems</td>
</tr>
</tbody>
</table>

**SECTION 907**
**FIRE ALARM AND DETECTION SYSTEMS**

**907.2.22 Battery rooms Energy storage systems.** An automatic smoke detection system or radiant-energy detection system shall be installed in rooms, areas and walk in
units containing stationary energy storage battery systems as required in Section 1206.2 1206.

907.2.23 Capacitor energy storage systems. An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 1206.3.

SECTION 911 EXPLOSION CONTROL

911.1 General. Explosion control shall be provided in the following locations:

1. Where a structure, room or space is occupied for purposes involving explosion hazards as identified in Table 911.1.

2. Where quantities of hazardous materials specified in Table 911.1 exceed the maximum allowable quantities in Table 5003.1.1(1).

Such areas shall be provided with explosion (deflagration) venting, explosion (deflagration) prevention systems or barricades in accordance with this section and NFPA 68, NFPA 69, or NFPA 495 as applicable. Deflagration venting shall not be utilized as a means to protect buildings from detonation hazards.

<table>
<thead>
<tr>
<th>MAT ERIAL</th>
<th>CLASS</th>
<th>EXPLOSION CONTROL METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Barricade construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explosion (deflagration) venting or explosion (deflagration) prevention systems</td>
</tr>
</tbody>
</table>

**TABLE 911.1 EXPLOSION CONTROL REQUIREMENTS**

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Special Uses</th>
<th>Barricade construction</th>
<th>Explosion (deflagration) venting or explosion (deflagration) prevention systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetylene generator rooms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy storage systems</td>
<td></td>
<td></td>
<td>Not required</td>
</tr>
<tr>
<td>Grain processing</td>
<td></td>
<td></td>
<td>Required</td>
</tr>
</tbody>
</table>

g. Where explosion control is required in Section 1206.

911.4 Deflagration venting. Deflagration venting shall be of an approved type and installed in accordance with the provisions of this code and NFPA 68.

SECTION 1201 GENERAL

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, and maintenance, repair, retrofitting, testing, commissioning and decommissioning of
energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

**1201.3 Mixed system installation.** Where approved, the aggregate *nameplate* kWh energy of all energy storage systems in a fire area shall not exceed the maximum quantity specified for any of the energy systems in this chapter. Where required by the fire code official, a hazard mitigation analysis shall be provided and approved in accordance with Section 104.7.2 to evaluate any potential adverse interaction between the various energy systems and technologies.

**SECTION 1202 DEFINITIONS**

**1202.1 Definitions.** The following terms are defined in Chapter 2:

- **BATTERY SYSTEM, STATIONARY STORAGE.**
- **BATTERY TYPES.**  
  - Lead-acid battery.
- **CAPACITOR ARRAY.**
- **CAPACITOR-ENERGY STORAGE SYSTEM.**
- **CRITICAL CIRCUIT.**
- **EMERGENCY POWER SYSTEM.**
- **ENERGY STORAGE MANAGEMENT SYSTEMS.**
- **ENERGY STORAGE SYSTEM.**
- **ENERGY STORAGE SYSTEM CABINET.**
- **ENERGY STORAGE SYSTEM COMMISSIONING.**
- **ENERGY STORAGE SYSTEM DECOMMISSIONING.**
- **ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.**
- **ENERGY STORAGE SYSTEM, MOBILE.**
- **ENERGY STORAGE SYSTEM, WALK-IN UNIT.**
- **FUEL CELL POWER SYSTEM, STATIONARY.**
- **STANDBY POWER SYSTEM.**
- **STATIONARY BATTERY ARRAY.**

**SECTION 1203 EMERGENCY AND STANDBY POWER SYSTEMS**

**1203.2.6 Gas detection systems.** Emergency power shall be provided for gas detection systems where required by Sections 1203.2.9 and 1203.2.16. Standby power shall be provided for gas detection systems where required by Sections 916.5 and 1206.6.2.2.4.
**1203.2.19 Exhaust ventilation.** Standby power shall be provided for mechanical exhaust ventilation systems as required in Section 1206.6.1.2.1. The system shall be capable of powering the required load for a duration of not less than two hours.

**SECTION 1205**
**STATIONARY FUEL CELL POWER SYSTEMS**

**1205.1 General.** Stationary fuel cell power systems in new and existing occupancies shall comply with this section.

*Exception:* The temporary use of a fuel cell powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1205.14.

**1205.5 Residential use.** Stationary fuel cell power systems shall not be installed in Group R-3 and R-4 buildings, or dwelling units associated with Group R-2 buildings unless they are specifically listed for residential use.

*Exception:* The temporary use of a fuel cell powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1205.14.

**1205.14 Group R-3 and R-4 Fuel Cell Vehicle ESS Use.** The temporary use of the dwelling unit owner or occupant’s fuel cell powered electric vehicle to power a Group R-3 or R-4 dwelling while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer’s instructions and NFPA 70.

**SECTION 1206**
**ELECTRICAL ENERGY STORAGE SYSTEMS (ESS)**

**1206.1 Scope.** The provisions in this section are applicable to stationary and mobile energy storage systems (ESS), designed to provide electrical power to a building or facility. These systems are used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

*Exception:* ESS in Group R-3 and R-4 occupancies shall comply with Section 1206.11.

**1206.1.1 Scope.** ESS having capacities exceeding the values shown in Table 1206.1 shall comply with this section.

**1206.1.2 Permits.** Permits shall be obtained for ESS as follows:

1. Construction permits shall be obtained for stationary ESS installations and for mobile ESS charging and storage installations covered by 1206.10.1. Permits shall be obtained in accordance with Sections 105.7.2.

2. Operational permits shall be obtained for stationary ESS installations and for mobile ESS deployment operations covered by Section 1206.10.3. Permits shall be obtained in accordance with Sections 105.6.52.
1206.1.2.1 Communication utilities. Operational permits shall not be required for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

**TABLE 1206.1**

**ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES**

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>ENERGY CAPACITY a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead acid batteries, all types</td>
<td>70 KWh (252 Megajoules) c</td>
</tr>
<tr>
<td>Nickel cadmium batteries (Ni-Cd)</td>
<td>70 KWh (252 Megajoules)</td>
</tr>
<tr>
<td>Nickel metal hydride (Ni-MH)</td>
<td>70 KWh (252 Megajoules)</td>
</tr>
<tr>
<td>Lithium-ion batteries</td>
<td>20 KWh (72 Megajoules)</td>
</tr>
<tr>
<td>Flow batteries b</td>
<td>20 KWh (72 Megajoules)</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>10 KWh (36 Megajoules)</td>
</tr>
<tr>
<td>Capacitor ESS</td>
<td>3 KWh (10.8 Mega joules)</td>
</tr>
<tr>
<td>Other electrochemical ESS technologies</td>
<td>3 KWh (10.8 Mega joules)</td>
</tr>
</tbody>
</table>

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in Amp-Hours, KWh shall equal rated voltage times amp-hour rating divided by 1000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies.

c. 50 gallons of lead acid battery electrolyte shall be considered equivalent to 70 KWh.

1206.1.3 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.

2. Details on the hourly fire-resistance ratings of assemblies enclosing the ESS.

3. The quantities and types of ESS to be installed.

4. Manufacturer’s specifications, ratings and listings of each ESS.

5. Description of energy (battery) management systems and their operation.

6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and deflagration venting systems, if provided.

8. Support arrangement associated with the installation, including any required seismic restraint.

9. A commissioning plan complying with 1206.2.1.

10. A decommissioning plan complying with 1206.2.3.

1206.1.4 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Where ESS technologies not specifically identified in Table 1206.1 are provided.

2. More than one ESS technology is provided in a room or enclosed area where there is a potential for adverse interaction between technologies.

3. Where allowed as a basis for increasing maximum allowable quantities. See Section 1206.5.2.

1206.1.4.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single ESS rack, module or unit.

2. Failure of any battery (energy) management system.

3. Failure of any required ventilation or exhaust system.

4. Voltage surges on the primary electric supply.

5. Short circuits on the load side of the ESS.

6. Failure of the smoke detection, fire detection, fire suppression, or gas detection system.

7. Required spill neutralization not being provided or failure of a required secondary containment system.

1206.1.4.2 Analysis approval. The fire code official is authorized to approve the hazardous mitigation analysis provided the consequences of the hazard mitigation analysis demonstrate:
1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance rated separations identified in Section 1206.7.4.

2. Fires in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.

3. Toxic and highly toxic gases released during fires will not reach concentrations in excess of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate occupants from any affected area.

4. Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).

5. Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases preventing accumulation or by deflagration venting.

1206.1.4.3 Additional protection measures. Construction, equipment and systems that are required for the ESS to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section 1206 shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters.

1206.1.5 Large scale fire test. Where required elsewhere in Section 1206, large scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an approved testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas and walk-in units will be contained within the room, enclosed area or walk-in unit for a duration equal to the fire resistance rating of the room separation specified in Section 1206.7.4. The test report shall be provided to the fire code official for review and approval in accordance with Section 104.7.2.

1206.1.6 Fire remediation. Where a fire or other event has damaged the ESS and ignition or re-ignition of the ESS is possible, the system owner, agent, or lessee shall take the following actions, at their expense, to mitigate the hazard or remove damaged equipment from the premises to a safe location.

1206.1.6.1 Fire mitigation personnel. Where, in the opinion of the fire code official, it is essential for public safety that trained personnel be on site to respond to possible ignition or re-ignition of a damaged ESS, the system owner, agent or lessee shall immediately dispatch one or more fire mitigation personnel to the premise, as required and approved, at their
expense. These personnel shall remain on duty continuously after the fire department leaves the premise until the damaged energy storage equipment is removed from the premises, or earlier if the fire code official indicates the public safety hazard has been abated.

**1206.1.6.2 Duties.** On-duty fire mitigation personnel shall have the following responsibilities:

1. Keep diligent watch for fires, obstructions to means of egress and other hazards.

2. Immediately contact the fire department if their assistance is needed to mitigate any hazards or extinguish fires.

3. Take prompt measures for remediation of hazards in accordance with the decommissioning plan in Section 1206.2.3.

4. Take prompt measures to assist in the evacuation of the public from the structures.

| TABLE 1206.2 |
| **BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.** |
| **BATTERY TECHNOLOGY** | **CAPACITY** |
| Flow batteries. | 20 kWh |
| Lead acid, all types | 70 kWh |
| Lithium, all types | 20 kWh |
| Nickel cadmium (Ni-Cd) | 70 kWh |
| Sodium, all types | 20 kWh |
| Other battery technologies | 10 kWh |

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For batteries rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.

c. 70 kWh for sodium-ion technologies.

**1206.2 Stationary storage battery systems Commissioning, decommissioning, operation and maintenance.** Stationary storage battery systems having capacities exceeding the values shown in Table 1206.2 shall comply with Section 1206.2.1 through 1206.2.12.6, as applicable. Commissioning, decommissioning, operation and maintenance shall be conducted in accordance with this section.

**1206.2.1 Permits Commissioning.** Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with Section 405.7.2. Commissioning of newly installed ESS, and existing ESS that have been...
retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been approved prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning including the personnel intended to accomplish each of the activities.

2. A listing of the specific ESS and associated components, controls and safety related devices to be tested, a description of the tests to be performed and the functions to be tested.

3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.

4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.

5. Verification that required equipment and systems are installed in accordance with the approved plans and specifications.

6. Integrated testing for all fire and safety systems.

7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.

8. Preparation and delivery of operation and maintenance documentation.

9. Training of facility operating and maintenance staff.

10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.

11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.

12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or another event.
**Exception:** Commissioning shall not be required for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. However, a decommissioning plan shall be provided and maintained when required by the fire code official.

1206.2.1.1 Initial acceptance testing. During the commissioning process an ESS shall be evaluated for proper operation in accordance with the manufacturer's instructions and the commissioning plan prior to final approval.

1206.2.1.2 Commissioning report. A report describing the results of the system commissioning and including the results of the initial acceptance testing required in Section 1206.2.1.1 shall be provided to code official prior to final inspection and approval and maintained at an approved on-site location.

1206.2.2 Construction documents Operation and maintenance. The following information shall be provided with the permit application An operating and maintenance manual shall be provided to both the ESS owner or their authorized agent and the ESS operator before the ESS is put into operation and shall include the following:

1. Location and layout diagram of the room in which the stationary storage battery system is to be installed. Manufacturer's operation manuals and maintenance manuals for the entire ESS or for each component of the system requiring maintenance, that clearly identify the required routine maintenance actions.

2. Details on hourly fire-resistance-rated assemblies provided. Name, address and phone number of a service agency that has been contracted to service the ESS and its associated safety systems.

3. Quantities and types of storage batteries and battery systems. Maintenance and calibration information, including wiring diagrams, control drawings, schematics, system programming instructions and control sequence descriptions, for all energy storage control systems.

4. Manufacturer’s specifications, ratings and listings of storage batteries and battery systems. Desired or field-determined control set points that are permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.

5. Details on energy management systems. A schedule for inspecting and recalibrating all ESS controls.
6. Location and content of signage. A service record log form that lists the schedule for all required servicing and maintenance actions and space for logging such actions that are completed over time and retained on site.

7. Details on fire-extinguishing, smoke detection and ventilation systems.

8. Rack storage arrangement, including seismic support criteria.

The ESS shall be operated and maintained in accordance with the manual and a copy of the manual shall be retained at an approved onsite location.

1206.2.2.1 Ongoing inspection and testing. Systems that monitor and protect the ESS installation shall be inspected and tested in accordance with the manufacturer’s instructions and the operating and maintenance manual. Inspection and testing records shall be maintained in the operation and maintenance manual.

1206.2.3 Hazard mitigation analysis Decommissioning. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions. The code official shall be notified prior to decommissioning of an ESS. Decommissioning shall be performed in accordance with the decommissioning plan that includes the following:

1. Battery technologies not specifically identified in Table 1206.2 are provided. A narrative description of the activities to be accomplished for removing the ESS from service, and from the facility in which it is located.

2. More than one stationary storage battery technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies. A listing of any contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or another event.

3. Where allowed as a basis for increasing maximum allowable quantities in accordance with Section 1206.2.9.

1206.2.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the fire code official. Only single-failure modes shall be considered.

1. Thermal runaway condition in a single-battery storage rack, module or array.

2. Failure of any energy management system.
3. Failure of any required ventilation system.

4. Voltage surges on the primary electric supply.

5. Short circuits on the load side of the stationary battery storage system.

6. Failure of the smoke detection, fire-extinguishing or gas detection system.

7. Spill neutralization not being provided or failure of the secondary containment system.

**1206.2.3.2 Analysis approval.** The fire code official is authorized to approve the hazardous mitigation analysis provided that the hazard mitigation analysis demonstrates all of the following:

1. Fires or explosions will be contained within unoccupied battery storage rooms for the minimum duration of the fire-resistance-rated walls identified in Table 509.1 of the *California Building Code*.

2. Fires and explosions in battery cabinets in occupied work centers will be detected in time to allow occupants within the room to evacuate safely.

3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in excess of Immediately Dangerous to Life or Health (IDLH) levels in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.

4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 25 percent of their lower flammability limit (LFL).

5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

**1206.2.3.3 Additional protection measures.** Construction, equipment and systems that are required for the stationary storage battery system to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section 1206.2, shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters.
1206.2.4 Seismic and structural design. Stationary storage battery systems shall comply with the seismic design requirements in Chapter 16 of the California Building Code, and shall not exceed the floor-loading limitation of the building.

1206.2.5 Vehicle impact protection. Where stationary storage battery systems are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

1206.2.6 Combustible storage. Combustible materials not related to the stationary storage battery system shall not be stored in battery rooms, cabinets or enclosures. Combustible materials in occupied work centers covered by Section 1206.2.8.5 shall not be stored less than 3 feet (915 mm) from battery cabinets.

1206.2.7 Testing, maintenance and repair. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any storage batteries or system components used to replace existing units shall be compatible with the battery charger, energy management systems, other storage batteries and other safety systems. Introducing other types of storage batteries into the stationary storage battery system or other types of electrolytes into flow battery systems shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

1206.2.8 Location and construction. Rooms and areas containing stationary storage battery systems shall be designed, located and constructed in accordance with Sections 1206.2.8.1 through 1206.2.8.7.4.

1206.2.8.1 Location. Stationary storage battery systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

Exceptions:

1. Lead acid and nickel-cadmium stationary storage battery systems.

2. Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations, where approved by the fire code official.

1206.2.8.2 Separation. Rooms containing stationary storage battery systems shall be separated from other areas of the building in accordance with Section 509.1 of the California Building Code. Battery systems shall be allowed to be in the same room with the equipment they support.
1206.2.8.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems, and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 kWh (180 megajoules) each. Each stationary battery array shall be spaced not less than 3 feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:
1. Lead acid and nickel cadmium storage battery arrays.
2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 250 kWh (900 megajoules) each.
3. The fire code official is authorized to approve listed, pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large-scale fire and fault-condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an adjacent array, and be contained within the room for a duration equal to the fire-resistance rating of the room separation specified in Table 509 of the California Building Code.

1206.2.8.4 Separate rooms. Where stationary batteries are installed in a separate equipment room that can be accessed only by authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.

1206.2.8.5 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

1206.2.8.5.1 Cabinets. Where stationary batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

1206.2.8.6 Signage. Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent:
1. The room contains energized battery systems.
2. The room contains energized electrical circuits.

3. The additional markings required in Section 1206.2.12 for the types of storage batteries contained within the room.

**Exception:** Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

### 1206.2.8.6.1 Electrical disconnects
Where the stationary storage battery system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with the *California Electrical Code*.

### 1206.2.8.6.2 Cabinet signage
Battery storage cabinets provided in occupied work centers in accordance with Section 1206.2.8.5 shall have exterior labels that identify the manufacturer and model number of the system and electrical rating (voltage and current) of the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical and chemical hazards, as required by Section 1206.2.12.

### 1206.2.8.7 Outdoor installations
Stationary storage battery systems located outdoors shall comply with Sections 1206.2.8.7 through 1206.2.8.7.4, in addition to all applicable requirements of Section 1206.2. Installations in outdoor enclosures or containers that can be occupied for servicing, testing, maintenance and other functions shall be treated as battery storage rooms.

**Exception:** Stationary battery arrays in noncombustible containers shall not be required to be spaced 3 feet (914 mm) from the container walls.

### 1206.2.8.7.1 Separation
Stationary storage battery systems located outdoors shall be separated by a minimum 5 feet (1524 mm) from the following:

1. Lot lines.
2. Public ways.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

**Exception:** The fire code official is authorized to approve smaller separation distances if largescale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant
egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.2.8.7.2 Means of egress. Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but not less than 10 feet (3048 mm).

Exception: The fire code official is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

1206.2.8.7.3 Security of outdoor areas. Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

1206.2.8.7.4 Walk-in units. Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

<table>
<thead>
<tr>
<th>TABLE 1206.2.9</th>
<th>MAXIMUM ALLOWABLE BATTERY QUANTITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BATTERY TECHNOLOGY</td>
<td>MAXIMUM ALLOWABLE QUANTITIES. a</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Flow batteries b</td>
<td>600 kWh</td>
</tr>
<tr>
<td>Lead acid, all types</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Lithium, all types</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Nickel-cadmium (Ni-Cd)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Sodium, all types</td>
<td>600 kWh</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>200 kWh</td>
</tr>
</tbody>
</table>

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For batteries rated in amp-hours, Kilowatt-hours (kWh) shall equal rated battery voltage times the amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.

c. Shall be a Group H-4 occupancy if the fire code official determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard.

1206.2.9 Maximum allowable quantities. Fire areas within buildings containing stationary storage battery systems exceeding the maximum allowable quantities in Table 1206.2.9 shall comply with all applicable Group H occupancy requirements in this code and the California Building Code.
Exception: Where approved by the fire code official, areas containing stationary storage batteries that exceed the amounts in Table 1206.2.9 shall be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with Section 1206.2.3 and large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

1206.2.9.1 Mixed battery systems. Where areas within buildings contain different types of storage battery technologies, the total aggregate quantities of batteries shall be determined based on the sum of percentages of each battery type quantity divided by the maximum allowable quantity of each battery type. If the sum of the percentages exceeds 100 percent, the area shall be treated as a Group H occupancy in accordance with Table 1206.2.9.

1206.2.10 Storage batteries and equipment. The design and installation of storage batteries and related equipment shall comply with Sections 1206.2.10.1 through 1206.2.10.8.

1206.2.10.1 Listings. Storage batteries and battery storage systems shall comply with the following:
1. Storage batteries shall be listed in accordance with UL 1973.
2. Prepackaged and preengineered stationary storage battery systems shall be listed in accordance with UL 9540.

Exception: Lead-acid batteries are not required to be listed.

1206.2.10.2 Prepackaged and preengineered systems. Prepackaged and pre-engineered stationary storage battery systems shall be installed in accordance with their listing and the manufacturer’s instructions.

1206.2.10.3 Energy management system. An approved energy management system shall be provided for battery technologies other than lead-acid and nickel-cadmium for monitoring and balancing cell voltages, currents and temperatures within the manufacturer’s specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

1206.2.10.4 Battery chargers. Battery chargers shall be compatible with the battery chemistry and the manufacturer’s electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed pre-engineered or prepackaged stationary storage battery system.
1206.2.10.5 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

1206.2.10.6 Safety caps. Vented batteries shall be provided with flame arresting safety caps.

1206.2.10.7 Thermal runaway. Where required by Section 1206.2.12, storage batteries shall be provided with a listed device or other approved method to prevent, detect and control thermal runaway.

1206.2.10.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall comply with Chapter 60.

1206.2.11 Fire-extinguishing and detection systems. Fire-extinguishing and detection systems shall be provided in accordance with Sections 1206.2.11.1 through 1206.2.11.5.

1206.2.11.1 Fire-extinguishing systems. Rooms containing stationary storage battery systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire-extinguishing system based on fullscale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

Exception: Spaces or areas containing stationary storage battery systems used exclusively for telecommunications equipment in accordance with Section 903.2.

1206.2.11.1.1 Alternative fire-extinguishing systems. Battery systems that utilize water-reactive materials shall be protected by an approved alternative automatic fire-extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of storage batteries in the room. The fire code official shall be permitted to approve the alternative fire extinguishing system based on full-scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.
1206.2.11.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing stationary storage battery systems in accordance with Section 907.2.

1206.2.11.3 Ventilation. Where required by Section 1206.2.3 or 1206.2.12, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the California Mechanical Code and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit, or for hydrogen, 1.0 percent of the total volume of the room.

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot \((0.00508 \text{ m}^3/\text{s} \cdot \text{m}^2)\) of floor area, but not less than 150 cfm \((4 \text{ m}^3/\text{min})\). The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

1206.2.11.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain storage batteries that are required by Section 1206.2.3 or 1206.2.12 to be provided with ventilation, the cabinet shall be provided with ventilation in accordance with Section 1206.2.11.3.

1206.2.11.3.2 Supervision. Required mechanical ventilation systems for rooms and cabinets containing storage batteries shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visual signal at an approved constantly attended on-site location.

1206.2.11.4 Gas detection system. Where required by Section 1206.2.3 or 1206.2.12, rooms containing stationary storage battery systems shall be protected by a gas detection system complying with Section 916. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gas exceeds one-half of the IDLH.

1206.2.11.4.1 System activation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the battery storage room.

2. Transmission of an alarm to an approved location.
3. De-energizing of the battery charger.

4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

**Exception:** Lead-acid and nickel-cadmium stationary storage battery systems shall not be required to comply with Items 1, 2 and 3.

**1206.2.11.5 Spill control and neutralization.** Where required by Section 1206.2.12, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries as follows:

1. For batteries with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.

2. For batteries with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

**1206.2.12 Specific battery-type requirements.** This section includes requirements applicable to specific types of storage batteries. Stationary storage battery systems with more than one type of storage battery shall comply with requirements applicable to each battery type.

**1206.2.12.1 Lead-acid storage batteries.** Stationary storage battery systems utilizing lead-acid storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.

2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.

3. Thermal runaway protection shall be provided for valve-regulated lead-acid (VRLA) storage batteries in accordance with Section 1206.2.10.7.

4. The signage in Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.
1206.2.12.2 Nickel-cadmium (Ni-Cd) storage batteries. Stationary storage battery systems utilizing nickel-cadmium (Ni-Cd) storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.

2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.

3. Thermal runaway protection shall be provided for valve-regulated sealed nickel-cadmium storage batteries in accordance with Section 1206.2.10.7.

4. The signage in Section 1206.2.8.6 shall indicate the room contains nickel-cadmium batteries.

1206.2.12.3 Lithium-ion storage batteries. The signage in Section 1206.2.8.6 shall indicate the type of lithium batteries contained in the room.

1206.2.12.4 Sodium-beta storage batteries. Stationary storage battery systems utilizing sodium-beta storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.

2. The signage in Section 1206.2.8.6 shall indicate the type of sodium batteries in the room and include the instructions, “APPLY NO WATER.”

1206.2.12.5 Flow storage batteries. Stationary storage battery systems utilizing flow storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.

2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.

3. The signage required in Section 1206.2.8.6 shall indicate the type of flow batteries in the room.

1206.2.12.6 Other battery technologies. Stationary storage battery systems utilizing battery technologies other than those described in Sections 1206.2.12.1 through 1206.2.12.5 shall comply with the following:

1. Gas detection systems complying with Section 916 shall be provided in accordance with Section 1206.2.11.4 where the
batteries have the potential to produce toxic or highly toxic gas in
the storage room or cabinet in excess of the permissible exposure
limits (PEL) during charging, discharging and normal system
operation.

2. Mechanical ventilation shall be provided in accordance with
Section 1206.2.11.3.

3. Spill control and neutralization shall be in accordance with
Section 1206.2.11.5.

4. In addition to the signage required in Section 1206.2.8.6, the
marking shall identify the type of batteries present, describe the
potential hazards associated with the battery type, and indicate that
the room contains energized electrical circuits.

1206.3 Capacitor energy storage systems Equipment. ESS equipment shall be in
accordance with Sections 1206.3.1 through 1206.3.9. Capacitor energy storage
systems having capacities exceeding 3 kWh (10.8 megajoules) shall comply with
Sections 1206.3 through 1206.3.2.6.1.

Exception: Capacitors regulated by the California Electrical Code, Chapter 460,
and capacitors included as a component part of other listed electrical equipment
are not required to comply with this section.

1206.3.1 Permits Energy storage system listings. Permits shall be obtained
for the installation of capacitor energy storage systems in accordance with
Section 105.7.3. ESS shall be listed in accordance with UL 9540.

Exception: Lead-acid and nickel cadmium battery systems installed in
facilities under the exclusive control of communications utilities, and
operating at less than 50 VAC and 60 VDC in accordance with NFPA 76
are not required to be listed.

1206.3.2 Location and construction Equipment listing. Rooms and areas
containing capacitor energy storage systems shall be designed, located and
constructed in accordance with Sections 1206.3.2 through 1206.3.2.5. Chargers,
inverters, energy storage management systems shall be covered as part of the
UL 9540 listing or shall be listed separately.

1206.3.2.1 Location. Capacitor energy storage systems shall not be
located in areas where the floor is located more than 75 feet (22 860 mm)
above the lowest level of fire department vehicle access, or where the
floor level is more than 30 feet (9144 mm) below the finished floor of the
lowest level of exit discharge.
1206.3.2.2 Separation. Rooms containing capacitor energy storage systems shall be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the California Building Code.


1206.3.2.3 Capacitor arrays. Capacitor energy storage systems shall be segregated into capacitor arrays not exceeding 50 kWh (180 megajoules) each. Each array shall be spaced not less than 3 feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exception: Capacitor energy storage systems in noncombustible containers located outdoors shall not be required to be spaced 3 feet (914 mm) from the container walls.

1206.3.2.4 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to capacitor energy storage system rooms and shall include the following or equivalent verbiage and information:

1. “CAPACITOR ENERGY STORAGE ROOM.”

2. “THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS.”

3. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.

1206.3.2.5 Electrical disconnects. Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means identifying the location of the capacitor energy storage system disconnecting means in accordance with the California Electrical Code.

1206.3.2.6 Outdoor installation. Capacitor energy systems located outdoors shall comply with Sections 1206.3.2.6 through 1206.3.2.6.4 in addition to all applicable requirements of Section 1206.3. Installations in outdoor enclosures or containers that can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor storage rooms.

Exception: Capacitor arrays in noncombustible containers shall not be required to be spaced 3 feet (914 mm) from the container walls.
1206.3.2.6.1 Separation. Capacitor energy systems located outdoors shall be not less than 5 feet (1524 mm) from the following:

1. Lot lines.
2. Public ways.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

**Exception:** The fire code official is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.3.2.6.2 Means of egress. Capacitor energy storage systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but not less than 10 feet (3048 mm).

**Exception:** The fire code official is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

1206.3.2.6.3 Security of outdoor areas. Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

1206.3.2.6.4 Walk-in units. Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

1206.3.3 Maximum allowable quantities *Utility interactive systems.* Fire areas within buildings containing capacitor energy storage systems that exceed 600 kWh of energy capacity shall comply with all applicable Group H occupancy requirements in this code and the California Building Code. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.
1206.3.4 Capacitors and equipment **Energy storage management system.** The design and installation of capacitor energy storage systems and related equipment shall comply with Sections 1206.3.4.1 through 1206.3.4.5. Where required by the ESS listing an approved energy storage management system shall be provided for that which monitors and balances cell voltages, currents and temperatures within the manufacturer’s specifications. The system shall disconnect electrical connections to the ESS or otherwise place it in a safe condition if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

**1206.3.4.1 Listing.** Capacitors and capacitor energy storage systems shall comply with the following:

1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

**1206.3.4.2 Prepackaged and pre-engineered systems.** In addition to other applicable requirements of this code, prepackaged and pre-engineered capacitor energy storage systems shall be installed in accordance with their listing and the manufacturer’s instructions.

**1206.3.4.3 Energy management system.** An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer’s specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

**1206.3.4.4 Capacitor chargers.** Capacitor chargers shall be compatible with the capacitor manufacturer’s electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed pre-engineered or prepackaged capacitor energy storage system.

**1206.3.4.5 Toxic and highly toxic gas.** Capacitor energy storage systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal-use conditions shall comply with Chapter 60.

**1206.3.5 Fire-extinguishing and detection systems Enclosures.** Fire-extinguishing and smoke detection systems shall be provided in capacitor energy
storage system rooms in accordance with Sections 1206.3.5.1 through 1206.3.5.2. Enclosures of ESS shall be of noncombustible construction.

1206.3.5.1 Fire-extinguishing systems. Rooms containing capacitor energy storage systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific capacitor technologies shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the automatic sprinkler system based on full-scale fire and fault condition testing conducted by an approved laboratory.

1206.3.5.1.1 Alternative fire-extinguishing systems. Capacitor energy storage systems that utilize water-reactive materials shall be protected by an approved alternative automatic fire-extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The fire code official shall be permitted to approve the system based on full-scale fire and fault condition testing conducted by an approved laboratory.

1206.3.5.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing capacitor energy storage systems in accordance with Section 907.2.

1206.3.5.3 Ventilation. Where capacitors release flammable gases during normal operating conditions, ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the California Mechanical Code and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit.

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min). The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the ceiling for gases having a vapor density less than air.

1206.3.5.3.1 Supervision. Required mechanical ventilation systems for rooms containing capacitor energy storage systems shall be supervised by an approved central station, proprietary or remote station service, or shall initiate an audible and visible signal at an approved, constantly attended on-site location.
1206.3.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing capacitors as follows:

1. For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.

2. For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

1206.3.6 Testing, maintenance and repair Repairs. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing different capacitor technologies into the capacitor energy storage system shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service. Repairs of ESS shall only be done by qualified personnel. Repairs with other than identical parts shall be considered retrofitting and comply with Section 1206.3.7. Repairs shall be documented in the service records log.

1206.3.7 Retrofits. Retrofitting of an existing ESS shall comply with the following:

1. A construction permit shall be obtained in accordance with Section 105.7.7.

2. New batteries, battery modules, capacitors and similar ESS components shall be listed.

3. Battery management and other monitoring systems shall be connected and installed in accordance with the manufacturer's instructions.

4. The overall installation shall continue to comply with UL 9540 listing requirements, where applicable.

5. Systems that have been retrofitted shall be commissioned in accordance with Section 1206.2.1.

6. Retrofits shall be documented in the service records log.

1206.3.7.1 Retrofitting Lead Acid and Nickel Cadmium. Section 1206.3.7 shall not apply to retrofitting of lead acid and nickel
cadmium batteries with other lead acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

1206.3.8 Replacements. Replacements of ESS shall be considered new ESS installations and shall comply with the provisions of Section 1206 as applicable to new ESS. The ESS being replaced shall be decommissioned in accordance with Section 1206.2.3.

1206.3.9 Reused and repurposed equipment. Equipment and materials shall only be reused or reinstalled as permitted in Section 104.7.1. Storage batteries previously used in other applications, such as electric vehicle propulsion, shall not be reused in applications regulated by Chapter 12, unless (1) approved by the fire code official and (2) the equipment is refurbished by a battery refurbishing company approved in accordance with UL 1974.

1206.4 General installations requirements. Stationary and mobile ESS shall comply with the requirements of section 1206.4.1 through 1206.4.12.

1206.4.1 Electrical disconnects. Where the ESS disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

Exception: Electrical disconnects for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC shall be permitted to have electrical disconnects signage in accordance with NFPA 76.

1206.4.2 Working clearances. Access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with NFPA 70 and the manufacturer's instructions.

1206.4.3 Fire-resistance rated separations. Rooms and other indoor areas containing ESS shall be separated from other areas of the building in accordance with Section 1206.7.4. ESS shall be permitted to be in the same room with the equipment they support.

1206.4.4 Seismic and structural design. Stationary ESS shall comply with the seismic design requirements in Chapter 16 of the International Building Code, and shall not exceed the floor loading limitation of the building.
1206.4.5 Vehicle impact protection. Where ESS are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

1206.4.6 Combustible storage. Combustible materials shall not be stored in ESS rooms, areas, or walk-in units. Combustible materials in occupied work centers covered by Section 1206.4.10 shall be stored at least 3 feet (914 mm) from ESS cabinets.

1206.4.7 Toxic and highly toxic gases. ESS that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall be provided with a hazardous exhaust system in accordance with Section 502.8 of the International Mechanical Code.

1206.4.8 Signage. Approved signs shall be provided on or adjacent to all entry doors for ESS rooms or areas and on enclosures of ESS cabinets and walk-in units located outdoors, on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent.


2. The identification of the electrochemical ESS technology present.

3. "Energized electrical circuits"

4. If water reactive electrochemical ESS are present the signage shall include "APPLY NO WATER"

5. Current contact information, including phone number, for personnel authorized to service the equipment and for fire mitigation personnel required by Section 1206.1.6.1.

Exception: Existing electrochemical ESS shall be permitted to include the signage required at the time they were installed.

1206.4.9 Security of installations. Rooms, areas and walk-in units in which electrochemical ESS are located shall be secured against unauthorized entry and safeguarded in an approved manner. Security barriers, fences, landscaping, and other enclosures shall not inhibit the required air flow to or exhaust from the electrochemical ESS and its components.

1206.4.10 Occupied work centers. Electrochemical ESS located in rooms or areas occupied by personnel not directly involved with maintenance, service and testing of the systems shall comply with the following.
1. Electrochemical ESS located in occupied work centers shall be housed in locked noncombustible cabinets or other enclosures to prevent access by unauthorized personnel.

2. Where electrochemical ESS are contained in cabinets in occupied work centers, the cabinets shall be located within 10 feet (3048 mm) of the equipment that they support.

3. Cabinets shall include signage complying with Section 1206.4.8.

1206.4.11 Open rack installations. Where electrochemical ESS are installed in a separate equipment room and only authorized personnel have access to the room, they shall be permitted to be installed on an open rack for ease of maintenance.

1206.4.12 Walk-in units. Walk-in units shall only be entered for inspection, maintenance and repair of ESS units and ancillary equipment, and shall not be occupied for other purposes.

1206.5 Electrochemical ESS Protection. The protection of electrochemical ESS shall be in accordance with Sections 1206.5.1 through 1206.5.8 where required by Section 1206.7 through 1206.10.

1206.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 KWh (180 Mega joules). Each group shall be separated a minimum three feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:
1. Lead acid and nickel cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.

2. The fire code official is authorized to approve larger capacities or smaller separation distances based on large scale fire testing complying with Section 1206.1.5.

1206.5.2 Maximum allowable quantities. Fire areas within rooms, areas and walk-in units containing electrochemical ESS shall not exceed the maximum allowable quantities in Table 1206.5.

Exceptions:
1. Where approved by the fire code official, rooms, areas and walk in units containing electrochemical ESS that exceed the amounts in Table 1206.5 shall be permitted based on a hazardous mitigation
analysis in accordance with Section 1206.1.4 and large scale fire testing complying with Section 1206.1.5.

2. Lead-acid and nickel cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.

3. Dedicated use buildings in compliance with Section 1206.7.1.

1206.5.2.1 Mixed electrochemical energy systems. Where rooms, areas and walk-in units contain different types of electrochemical energy technologies, the total aggregate quantities of the systems shall be determined based on the sum of percentages of each technology type quantity divided by the maximum allowable quantity of each technology type. The sum of the percentages shall not exceed 100 percent of the maximum allowable quantity.

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>MAXIMUM ALLOWABLE QUANTITIES a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STORAGE BATTERIES</strong></td>
<td></td>
</tr>
<tr>
<td>Lead acid, all types</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Nickel cadmium (Ni-Cd)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Nickel metal hydride (Ni-MH)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Lithium-ion</td>
<td>600 KWh</td>
</tr>
<tr>
<td>Flow batteries b</td>
<td>600 KWh</td>
</tr>
<tr>
<td>Other battery technologies</td>
<td>200 KWh</td>
</tr>
<tr>
<td><strong>CAPACITORS</strong></td>
<td></td>
</tr>
<tr>
<td>All types</td>
<td>20 KWh</td>
</tr>
<tr>
<td><strong>OTHER ELECTROCHEMICAL ESS</strong></td>
<td></td>
</tr>
<tr>
<td>All types</td>
<td>20 KWh</td>
</tr>
</tbody>
</table>

a. For electrochemical ESS units rated in Amp-Hours, KWh shall equal rated voltage times the Amp-hour rating divided by 1000

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies

1206.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or
2. Where the floor is located below the lowest level of exit discharge.

Exceptions:

1. Lead acid and Nickel cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.

2. Where approved, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.

3. Where approved by the fire code official, installations shall be permitted on higher and lower floors.

1206.5.4 Fire detection. An approved automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas, and walk-in units containing electrochemical ESS. An approved radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where approved to a constantly attended location.

1206.5.4.1 System status. Where required by the fire code official, visible annunciation shall be provided on cabinet exteriors or in other approved locations to indicate that potentially hazardous conditions associated with the ESS exist.

1206.5.5 Fire suppression systems. Rooms and areas within buildings and walk-in units containing electrochemical ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. An automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 with a minimum density of 0.3 gpm/ft. based on the fire area or 2,500 ft. design area, whichever is smaller.

2. Where approved, an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification based on large scale fire testing complying with Section 1206.1.5.

3. The following alternate automatic fire extinguishing systems designed and installed in accordance with Section 904, provided the installation is approved by the fire code official based on large scale fire testing complying with Section 1206.1.5

NFPA 12, Standard on Carbon Dioxide Extinguishing Systems
NFPA 750, Standard on Water Mist Fire Protection Systems
NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems
NFPA 2010, Standard for Fixed Aerosol Fire-Extinguishing Systems

**Exception:** Fire suppression systems for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.

**1206.5.5.1 Water reactive systems.** Electrochemical ESS that utilize water reactive materials shall be protected by an approved alternative automatic fire-extinguishing system in accordance with Section 904, where the installation is approved by the fire code official based on large scale fire testing complying with Section 1206.1.5.

**1206.5.6 Maximum enclosure size.** Outdoor walk-in units housing ESS shall not exceed 53 feet by 8 feet by 9.5 feet high not including bolt on HVAC and related equipment as approved. Outdoor walk-in units exceeding these limitations shall be considered indoor installations and comply with the requirements in Section 1206.7.

**1206.5.7 Vegetation control.** Areas within 10 feet (3 m) on each side of outdoor ESS shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire.

**1206.5.8 Means of egress separation.** ESS located outdoors and in open parking garages shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case, less than 10 feet (3048 mm).

**Exception:** The fire code official is authorized to approve a reduced separation distance if large scale fire testing complying with Section 1206.1.5 is provided that shows that a fire involving the ESS will not adversely impact occupant egress.

**1206.6 Electrochemical ESS technology specific protection.** Electrochemical ESS installations shall comply with the requirements of this section in accordance with the applicable requirements of Table 1206.6.

<table>
<thead>
<tr>
<th>TABLE 1206.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTROCHEMICAL ESS TECHNOLOGY SPECIFIC REQUIREMENTS</td>
</tr>
</tbody>
</table>
### COMPLIANCE REQUIRED b

<table>
<thead>
<tr>
<th>BATTERY TECHNOLOGY</th>
<th>OTHER ESS AND BATTERY TECHNOLOGIES b</th>
<th>CAPACITOR ESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead-acid</td>
<td>Ni-Cad and Ni-MH</td>
<td>Lithium-ion</td>
</tr>
</tbody>
</table>

| No | Yes | Yes | Yes | Yes |
| No | Yes | Yes | Yes | Yes |
| No | No | Yes | Yes | Yes |
| No | No | Yes | Yes | Yes |

| 1206.6.1 Exhaust ventilation | Yes | Yes | No | Yes | Yes | Yes |
| 1206.6.2 Spill control and neutralization | Yes c | Yes c | No | Yes | Yes | Yes |
| 1206.6.3 Explosion control | Yes a | Yes a | Yes | No | Yes | Yes |
| 1206.6.4 Safety caps | Yes | Yes | No | No | Yes | Yes |
| 1206.6.5 Thermal runaway | Yes d | Yes | Yes e | No | Yes e | Yes |

**a.** Not required for lead-acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

**b.** Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.7.2 that provides justification why the protection is not necessary based on the technology used.

**c.** Applicable to vented (i.e. flooded) type nickel cadmium and lead acid batteries.

**d.** Not required for vented (i.e. flooded) type lead acid batteries.

**e.** The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

### 1206.6.1 Exhaust ventilation

**1206.6.1.1 Ventilation based upon LFL.** The exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area, or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.
1206.6.1.2 Ventilation based upon exhaust rate. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 ft/min/ft (5.1 L/sec/m) of floor area of the room, area, or walk-in unit. The ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 1206.6.1.2.4.

1206.6.1.2.1 Standby power. Mechanical exhaust ventilation shall be provided with a minimum of two hours of standby power in accordance with Section 1203.2.5.

1206.6.1.2.2 Installation instructions. Required mechanical exhaust ventilation systems shall be installed in accordance with the manufacturer's installation instructions and the International Mechanical Code.

1206.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised by an approved central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible signal at an approved constantly attended on-site location.

1206.6.1.2.4 Gas detection system. Where required by Section 1206.6.1.2, rooms, areas, and walk-in units containing ESS shall be protected by an approved continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area, or walk-in unit exceeds 25 percent of the LFL.

2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.

3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.6.

4. Failure of the gas detection system shall annunciate a trouble signal at an approved central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible trouble signal at an approved constantly attended on-site location.
1206.6.2 Spill control and neutralization. Where required by Table 1206.6 or elsewhere in this code, areas containing free-flowing liquid electrolyte or hazardous materials shall be provided with spill control and neutralization in accordance with this section.

1206.6.2.1 Spill control. Spill control shall be provided to prevent the flow of liquid electrolyte or hazardous materials to adjoining rooms or areas. The method shall be capable of containing a spill from the single largest battery or vessel.

1206.6.2.2 Neutralization. An approved method to neutralize spilled liquid electrolyte shall be provided that is capable of neutralizing a spill from the largest battery or vessel to a pH between 5.0 and 9.0.

1206.6.2.3 Spill control and neutralization for Communication Utilities. The requirements of Section 1206.6.2 - 1206.6.2.2 shall only apply when the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) for lead acid and nickel cadmium battery systems operating at less than 50 VAC and 60 VDC that are located at facilities under the exclusive control of communications utilities and those facilities comply with NFPA 76 in addition to applicable requirements of this code.

1206.6.3 Explosion control. Where required by Table 1206.6 or elsewhere in this code, explosion control complying with Section 911 shall be provided for rooms, areas or walk-in units containing electrochemical ESS technologies.

Exceptions:

1. Where approved, explosion control is permitted to be waived by the fire code official based on large scale fire testing complying with Section 1206.1.5 which demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules where tested in accordance with UL 9540A.

2. Where approved, explosion control is permitted to be waived by the fire code official based on documentation provided in accordance with Section 104.7 that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.

1206.6.4 Safety caps. Where required by Table 1206.6 or elsewhere in this code, vented batteries and other ESS shall be provided with flame-arresting safety caps.
1206.6.5 Thermal runaway. Where required by Table 1206.6 or elsewhere in this code, batteries and other ESS shall be provided with a listed device or other approved method to prevent, detect and minimize the impact of thermal runaway.

1206.7 Indoor installations. Indoor ESS installations shall be in accordance with Sections 1206.7.1 through 1206.7.4.

1206.7.1 Dedicated use buildings. For the purpose of Table 1206.7 dedicated use ESS buildings shall be classified as Group F-1 occupancies and comply with all the following:

1. The building shall only be used for ESS, electrical energy generation, and other electrical grid related operations.

2. Occupants in the rooms and areas containing ESS are limited to personnel that operate, maintain, service, test and repair the ESS and other energy systems.

3. No other occupancy types shall be permitted in the building.

4. Administrative and support personnel shall be permitted in areas within the buildings that do not contain ESS, provided:

   4.1 The areas do not occupy more than 10 percent of the building area of the story in which they are located.

   4.2 A means of egress is provided from the incidental use areas to the public way that does not require occupants to traverse through areas containing ESS or other energy system equipment.

1206.7.2 Non-dedicated use buildings. For the purpose of Table 1206.7 non-dedicated use buildings include all buildings that contain ESS and do not comply with Section 1206.7.2 dedicated use building requirements.

---

### TABLE 1206.7 INDOOR ESS INSTALLATIONS

<table>
<thead>
<tr>
<th>COMPLIANCE REQUIRED</th>
<th>DEDICATED USE BUILDINGS a</th>
<th>NON-DEDICATED USE BUILDINGS b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206.4 General installation requirements</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.1 Size and separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.2 Maximum allowable quantities</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.3 Elevation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.4 Smoke and automatic fire detection</td>
<td>Yes c, e</td>
<td>Yes</td>
</tr>
</tbody>
</table>
COMPLIANCE REQUIRED | DEDICATED USE BUILDINGS \(^a\) | NON-DEDICATED USE BUILDINGS \(^b\)  
--- | --- | ---  
1206.5.5 Fire suppression systems | Yes \(^d\) | Yes  
1206.6 Technology specific protection | Yes | Yes  
1206.7.3 Dwelling units and sleeping units | NA | Yes  
1206.7.4 Fire resistance rated separations | Yes | Yes  

NA = Not allowed.

a. See Section 1206.7.1.

b. See Section 1206.7.2.

c. Where approved by the fire code official, alarm signals are not required to be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or a constantly attended location where local fire alarm annunciation is provided and trained personnel are always present.

d. Where approved by the fire code official, fire suppression systems are permitted to be omitted in dedicated use buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

e. Lead-acid and nickel cadmium battery systems installed in Group U buildings and structures less than 1500 ft (140 m) under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76 are not required to have an approved automatic smoke or fire detection system.

1206.7.3 Dwelling units and sleeping units. ESS shall not be installed in sleeping units or in habitable spaces of dwelling units.

1206.7.4 Fire-resistance rated separations. Rooms and areas containing ESS shall include fire-resistance rated separations as follows:

1. In dedicated use buildings, rooms and areas containing ESS shall be separated from areas in which administrative and support personnel are located.

2. In non-dedicated use buildings, rooms and areas containing ESS shall be separated from other areas in the building.

Separation shall be provided by 2 hour rated fire barriers constructed in accordance with Section 707 of the California Building Code and 2 hour rated horizontal assemblies constructed in accordance with Section 711 of the California Building Code, as appropriate.
1206.8 Outdoor installations. Outdoor installations shall be in accordance with Sections 1206.8.1 through 1206.8.3. Exterior wall installations for individual ESS units not exceeding 20 KWh shall be in accordance with Section 1206.8.4.

1206.8.1 Remote outdoor installations. For the purpose of Table 1206.8, remote outdoor installations include ESS located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

1206.8.2 Installations near exposures. For the purpose of Table 1206.8, installations near exposures include all outdoor ESS installations that do not comply with Section 1206.8.1 remote outdoor location requirements.

### TABLE 1206.8
OUTDOOR ESS INSTALLATIONS

<table>
<thead>
<tr>
<th>COMPLIANCE REQUIRED</th>
<th>REMOTE INSTALLATIONS a</th>
<th>INSTALLATIONS NEAR EXPOSURES b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206.4 All ESS installations</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.1 Size and separation</td>
<td>No</td>
<td>Yes c</td>
</tr>
<tr>
<td>1206.5.2 Maximum allowable quantities</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.4 Smoke and automatic fire detection</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.5 Fire suppression systems</td>
<td>Yes d</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.6 Maximum enclosure size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.7 Vegetation control</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.8 Means of egress separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.6 Technology specific protection</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.8.3 Clearance to exposures</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

a. See Section 1206.8.1.

b. See Section 1206.8.2.

c. In outdoor walk-in units, spacing is not required between ESS units and the walls of the enclosure.

d. Where approved by the fire code official, fire suppression systems are permitted to be omitted.

1206.8.3 Clearance to exposures. ESS located outdoors shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Lot lines
2. Public ways

3. Buildings

4. Stored combustible materials

5. Hazardous materials

6. High-piled stock

7. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1 hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and extending 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.

2. Clearances to buildings are permitted to be reduced to 3 feet (914 mm) where noncombustible exterior walls with no openings or combustible overhangs are provided on the wall adjacent to the ESS and the fire resistance rating of the exterior wall is a minimum 2 hours.

3. Clearances to buildings are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS, and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section 1206.1.5.

1206.8.4 Exterior wall installations. ESS shall be permitted to be installed outdoors on exterior walls of buildings when all the following conditions are met:

1. The maximum energy capacity of individual ESS units shall not exceed 20 kWh.

2. The ESS shall comply with applicable requirements in Section 1206.

3. The ESS shall be installed in accordance with the manufacturer's instructions and their listing.

4. Individual ESS units shall be separated from each other by at least three feet (914 mm).
5. The ESS shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least five feet (1524 mm).

   **Exception:** Where approved smaller separation distances in items 4 and 5 shall be permitted based on large scale fire testing complying with Section 1206.1.5.

### 1206.9 Special installations

Rooftop and open parking garage ESS installations shall comply with Sections 1206.9.1 through 1206.9.6.

**1206.9.1 Rooftop installations.** For the purpose of Table 1206.9, rooftop ESS installations are those located on the roofs of buildings.

**1206.9.2 Open parking garage installations.** For the purpose of Table 1206.9, open parking garage ESS installations are those located in a structure or portion of a structure that complies with Section 406.5 of the California Building Code.

### TABLE 1206.9

**SPECIAL ESS INSTALLATIONS**

<table>
<thead>
<tr>
<th>COMPLIANCE REQUIRED</th>
<th>ROOFTOPS a</th>
<th>OPEN PARKING GARAGES b</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206.4 All ESS installations</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.1 Size and separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.2 Maximum allowable quantities</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.4 Smoke and automatic fire detection</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.6 Maximum enclosure size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.8 Means of egress separation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.9.3 Clearance to exposures</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.6 Technology specific protection</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.9.4 Fire suppression systems</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.9.5 Rooftop installations</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1206.9.6 Open parking garage installations</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*See Section 1206.9.1.

b. See Section 1206.9.2.

**1206.9.3 Clearance to exposures.** ESS located on rooftops and in open parking garages shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Buildings, except the building on which rooftop ESS is mounted
2. Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed

3. Lot lines

4. Public ways

5. Stored combustible materials

6. Locations where motor vehicles can be parked

7. Hazardous materials

8. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1 hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and extending 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.

2. Clearances are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section 1206.1.5.

1206.9.4 Fire suppression systems. ESS located in walk-in units on rooftops or in walk-in units in open parking garages shall be provided with automatic fire suppression systems within the ESS enclosure in accordance with Section 1206.5.5. Areas containing ESS other than walk-in units in open parking structures on levels not open above to the sky shall be provided with an automatic fire suppression system complying with Section 1206.5.5.

Exception: A fire suppression system is not required in open parking garages if large scale fire testing complying with Section 1206.1.5 is provided that shows that a fire will not impact the exposures in Section 1206.9.3.

1206.9.5 Rooftop installations. ESS and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1. Stairway access to the roof for emergency response and fire department personnel shall be provided either through a bulkhead from the interior of the building or a stairway on the exterior of the building.
2. Service walkways at least 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.

3. ESS and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment, or component but not less than 5 feet (1.5 m).

4. The roofing materials under and within 5 feet (1524 mm) horizontally from an ESS or associated equipment shall be noncombustible or shall have a Class A rating when tested in accordance with ASTM E108 or UL 790.

5. A Class I standpipe outlet shall be installed at an approved location on the roof level of the building or in the stairway bulkhead at the top level.

6. The ESS shall be the minimum of 10 feet from the fire service access point on the roof top.

1206.9.6 Open parking garages. ESS and associated equipment that located in open parking garages shall comply with all of the following:

1. ESS shall not be located within 50 feet (15,240 mm) of air inlets for building HVAC systems.

   **Exception:** This distance shall be permitted to be reduced to 25 feet (7.620 mm) if the automatic fire alarm system monitoring the radiant-energy sensing detectors de-energizes the ventilation system connected to the air intakes upon detection of fire.

2. ESS shall not be located within 25 feet (7620 mm) of exits leading from the attached building where located on a covered level of the parking structure not directly open to the sky above.

3. An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of the ESS.

1206.10 Mobile ESS equipment and operations. Mobile ESS equipment and operations shall comply with Sections 1206.10.1 through 1206.10.7.

1206.10.1 Charging and storage. For the purpose of Section 1206.10, charging and storage covers the operation where mobile ESS are charged and stored so
they are ready for deployment to another site, and where they are charged and stored after a deployment.

1206.10.2 Deployment. For the purpose of Section 1206.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

1206.10.3 Permits. Construction and operational permits shall be provided for charging and storage of mobile ESS and operational permits shall be provided for deployment of mobile ESS as required by Section 1206.1.2.

1206.10.4 Construction documents. Construction documents complying with Section 1206.3 shall be provided with the construction permit application for mobile ESS charging and storage locations.

1206.10.4.1 Deployment documents. The following information shall be provided with the operation permit applications for mobile ESS deployments:

1. Relevant information for the mobile ESS equipment and protection measures in the construction documents required by Section 1206.1.3.

2. Location and layout diagram of the area in which the mobile ESS is to be deployed, including a scale diagram of all nearby exposures.

3. Location and content of signage, including no smoking signs.

4. Description of fencing to be provided around the ESS, including locking methods.

5. Details on fire suppression, smoke and automatic fire detection, system monitoring, thermal management, exhaust ventilation, and explosion control, if provided.

6. For deployment, the intended duration of operation, including anticipated connection and disconnection times and dates.

7. Location and description of local staging stops during transit to the deployment site. See Section 1206.10.8.5.

8. Description of the temporary wiring, including connection methods, conductor type and size, and circuit overcurrent protection to be provided.
9. Description of how fire suppression system connections to water supplies or extinguishing agents are to be provided.

10. Contact information for personnel who are responsible for maintaining and servicing the equipment, and responding to emergencies as required by Section 1206.1.6.1.

1206.10.5 Approved locations. Locations where mobile ESS are charged, stored and deployed shall be restricted to the locations established on the construction and operational permits.

1206.10.6 Charging and storage. Installations where mobile ESS are charged and stored shall be treated as permanent ESS indoor or outdoor installations, and shall comply with the following sections, as applicable:

1. Indoor charging and storage shall comply with Section 1206.7.

2. Outdoor charging and storage shall comply with Section 1206.8.

3. Charging and storage on rooftops and in open parking garages shall comply with Section 1206.9.

Exceptions:

1. Electrical connections shall be permitted to be made using temporary wiring complying with the manufacturer’s instructions, the UL 9540 listing, and the California Electrical Code.

2. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

1206.10.7 Deployed mobile ESS requirements. Deployed mobile ESS equipment and operations shall comply with this section and Table 1206.10.

1206.10.7.1 Duration. The duration of mobile ESS deployment shall not exceed 30 days.

Exceptions:

1. Mobile ESS deployments that provide power for durations longer than 30 days shall comply with Section 1206.10.7.

2. Mobile ESS deployments shall not exceed 180 days unless additional operational permits are obtained.
1206.10.7.2 Restricted locations. Deployed mobile ESS operations shall not be located indoors, in covered parking garages, on rooftops, below grade, or under building overhangs.

1206.10.7.3 Clearance to exposures. Deployed mobile ESS shall be separated by a minimum 10 feet (3048 mm) from the following exposures:

1. Public ways
2. Buildings
3. Stored combustible materials
4. Hazardous materials
5. High-piled stock
6. Other exposure hazards

Deployed mobile ESS shall be separated by a minimum 50 feet (15.3 M) from public seating areas and from tents, canopies and membrane structures with an occupant load of 30 or more.

1206.10.7.4 Electrical connections. Electrical connections shall be made in accordance with the manufacturer’s instructions and the UL 9540 listing. Temporary wiring for electrical power connections shall comply with the California Electrical Code. Fixed electrical wiring shall not be provided.

1206.10.7.5 Local staging. Mobile ESS in transit from the charging and storage location to the deployment location and back shall not be parked within 100 feet (30,480 mm) of an occupied building for more than one hour during transit, unless specifically approved by the fire code official when the permit is issued.

1206.10.7.6 Fencing. An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of a deployed mobile ESS.

1206.10.7.7 Smoking. Smoking shall be prohibited within 10 feet (3048 mm) of mobile ESS. Signs shall be posted in accordance with Section 310.

<table>
<thead>
<tr>
<th>TABLE 1206.10</th>
<th>MOBILE ENERGY STORAGE SYSTEMS (ESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLIANCE REQUIRED</td>
<td>COMPLIANCE REQUIRED a</td>
</tr>
<tr>
<td>1206.4 All ESS installations</td>
<td>Yes b</td>
</tr>
<tr>
<td>1206.5.1 Size and separation</td>
<td>Yes c</td>
</tr>
</tbody>
</table>
### COMPLIANCE REQUIRED

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement <em>a</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1206.5.2 Maximum allowable quantities</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.4 Smoke and automatic fire detection</td>
<td>Yes <em>e</em></td>
</tr>
<tr>
<td>1206.5.5 Fire suppression systems</td>
<td>Yes <em>d</em></td>
</tr>
<tr>
<td>1206.5.6 Maximum enclosure size</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.7 Vegetation control</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.5.8 Means of egress separation</td>
<td>Yes</td>
</tr>
<tr>
<td>1206.6 Technology specific protection</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*a.* See Section 1206.10.2.

*b.* Mobile operations on wheeled vehicle or trailers shall not be required to comply with Section 1206.4.4 seismic and structural load requirements.

c. In walk-in units, spacing is not required between ESS units and the walls of the enclosure.

d. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

e. Alarm signals are not required to be transmitted to an approved location for mobile ESS deployed 30 days or less.

### 1206.11 ESS in Group R-3 and R-4 Occupancies

*ESS in Group R-3 and R-4 occupancies shall be installed and maintained in accordance with Sections 1206.11.1 through 1206.11.9. The temporary use of an owner or occupant's electric powered vehicle as an ESS shall be in accordance with Section 1206.4.10.*

#### 1206.11.1 Equipment listings

ESS shall be listed and labeled use in accordance with UL 9540. ESS listed and labeled solely for utility or commercial use shall not be used for residential applications.

**Exceptions:**

1. Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.

2. ESS less than 1 kWh (3.6 megajoules).

#### 1206.11.2 Installation

ESS shall be installed in accordance with the manufacturer's instructions and their listing.
1206.11.2.1 Spacing. Individual units shall be separated from each other by at least three feet of spacing unless smaller separation distances are documented to be adequate based on large scale fire testing complying with Section 1206.1.5.

1206.11.3 Location. ESS shall only be installed in the following locations:

1. Detached garages and detached accessory structures.

2. Attached garages separated from the dwelling unit living space and sleeping units in accordance with Section 406.3.2 of the California Building Code.

3. Outdoors on exterior walls located a minimum 3 ft. from doors and windows.

4. Utility closets and storage or utility spaces within dwelling units and sleeping units.

1206.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 KWh. The aggregate rating structure shall not exceed:

1. 40 kWh within utility closets and storage or utility spaces.

2. 80 kWh in attached or detached garages and detached accessory structures.

3. 80 kWh on exterior walls.

4. 80 kWh outdoors on the ground.

1206.11.5 Electrical installation. ESS shall be installed in accordance with California Electrical Code. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

1206.11.6 Fire detection. Rooms and areas within dwellings units, sleeping units and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.10. A heat detector listed and interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.

1206.11.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers.
Appliances in garages shall also be installed in accordance with Section 304.3 of the California Mechanical Code.

1206.11.8 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with Section 1206.6.1.

1206.11.9 Toxic and highly toxic gas. ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.

1206.11.10 Electric vehicle use. The temporary use of an owner or occupant’s electric powered vehicle to power a dwelling unit or sleeping unit while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and California Electrical Code.

### TABLE 2204.1
**SPECIFIC HAZARDS STANDARDS**

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA 68</td>
<td>Standard on Explosion Protection by Deflagration Venting</td>
</tr>
</tbody>
</table>

### CHAPTER 80
**REFERENCED STANDARDS**

**NFPA**
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

**68–13:**
*Standard on Explosion Protection by Deflagration Venting*

**76 - 16:**
*Standard for the Fire Protection of Telecommunications Facilities*

**UL**
Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

**1974 -17:**
*Evaluation for Re-purposing Batteries*

**9540A-17:**

**Item 14. Automatic Parking Garage CBC**
SECTI ON 202 DEFINITIONS
Add new definition as follows:

MECHANICAL-ACCESS ENCLOSED PARKING GARAGE  An enclosed parking garage which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay.

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

406.6.4 Mechanical-access garages. Mechanical-access enclosed parking garages shall be in accordance with Sections 406.6.4.1 through 406.6.4.5.

406.6.4.1 Separation. Mechanical-access enclosed parking garages shall be separated from other occupancies and accessory uses by not less than 2-hour fire barriers constructed in accordance with Section 707 or by not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

406.6.4.2 Smoke removal. A mechanical smoke removal system, in accordance with Section 910.4, shall be provided for all areas containing a mechanical-access enclosed parking garage.

406.6.4.3 Fire control equipment room. The fire control equipment, consisting of the fire alarm control unit, mechanical ventilation controls and emergency shut down switch shall be provided in a room located where the equipment is able to be accessed by the fire service from a secured exterior door of a building. The room shall be a minimum of 50 square feet in size and shall be in a location that is approved by the fire code official.

406.6.4.3.1 Emergency shut down switch. The mechanical parking system shall be provided with a manually activated emergency shutdown switch for use by emergency personnel. The switch shall be clearly identified and shall be in a location approved by the fire code official.

406.6.4.4 Fire department access doors. Access doors shall be provided in accordance with Section 3203.7 of the California Fire Code.

SECTION 508
MIXED USE AND OCCUPANCY

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS) f
(Table remains unchanged. Editorial change to section number references in footnote c.)

c. See Section 406.3.2 406.3.2 and 406.6.4.

[F] TABLE 903.2.11.6
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>406.6.4</td>
<td>Mechanical-access enclosed parking garages</td>
</tr>
</tbody>
</table>

Item 15. Automatic Parking Garage CFC
CFC:

SECTION 202 DEFINITIONS
Add new definition as follows

MECHANICAL-ACCESS ENCLOSED PARKING GARAGE. An enclosed parking garage which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay.

903.2.10.2 Mechanical-access enclosed parking garages. An approved automatic sprinkler system shall be provided throughout buildings used for the storage of motor vehicles in a mechanical-access enclosed parking garage. The portion of the building that contains the mechanical-access enclosed parking garage shall be protected with a specially engineered automatic sprinkler system.

TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>903.2.10.2</td>
<td>Mechanical-access enclosed parking garages</td>
</tr>
</tbody>
</table>