

**REVISION RECORD FOR THE
STATE OF CALIFORNIA

EMERGENCY SUPPLEMENT**

October 23, 2008

2007 Title 24, Part 9, California Fire Code

**PLEASE NOTE: The date of this Emergency Supplement is for identification purposes only.
See the History Note Appendix for the adoption and effective dates of the provisions.**

It is suggested that the section number as well as the page number be checked when inserting this material and removing the superseded material. In case of doubt, rely on the section numbers rather than the page numbers because the section numbers must run consecutively.

It is further suggested that the material be retained with this revision record sheet so that the prior wording of any section can be easily ascertained.

Please keep the removed pages with this revision page for future reference.

Note

Due to the fact that the application date for a building permit establishes the California Building Standards Code provisions that are effective at the local level, which apply to the plans, specifications, and construction for that permit, it is strongly recommended that the removed pages be retained for historical reference.

Remove Existing Pages

v and vi
53 and 54
59 and 60
93 through 100
113 and 114
119 and 120
125 and 126
133 and 134
583 and 584

Insert Blue Pages

v and vi
53 and 54
59 and 60
93 through 100
113 and 114
119 and 120
125 and 126
133 and 134
583 and 584

How to Distinguish Between Model Code Language and California Amendments

To distinguish between model code language and the incorporated California amendments, including exclusive California standards, California amendments will appear in italics.

Due to the nature of the California Fire Code's first time use of the International Fire Code as the base document, symbols in the margins, previously used to indicate code changes, will not be used in this edition of the California Fire Code.

[SFM] This symbol within a section identifies which State agency(s), by its "acronym," has amended a section of the model code.

Legend of Acronyms of Adopting State Agencies

<i>BSC</i>	<i>California Building Standards Commission</i>
<i>SFM</i>	<i>Office of the State Fire Marshal</i>
<i>HCD</i>	<i>Department of Housing and Community Development</i>
<i>DSA-AC</i>	<i>Division of the State Architect-Access Compliance</i>
<i>DSA-SS</i>	<i>Division of the State Architect-Structural Safety</i>
<i>OSHPD</i>	<i>Office of Statewide Health Planning and Development</i>
<i>CSA</i>	<i>Corrections Standards Authority</i>
<i>DHS</i>	<i>Department of Health Services</i>
<i>AGR</i>	<i>Department of Food and Agriculture</i>
<i>CEC</i>	<i>California Energy Commission</i>
<i>CA</i>	<i>Department of Consumer Affairs: Board of Barbering and Cosmetology Board of Veterinary Medicine Examiners Board of Pharmacy Acupuncture Board Bureau of Home Furnishings Structural Pest Control Board</i>
<i>SL</i>	<i>State Library</i>
<i>SLC</i>	<i>State Lands Commission</i>
<i>DWR</i>	<i>Department of Water Resources</i>

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

- || This symbol indicates that a change has been made to a California amendment.
- * This symbol indicates California deletion of an entire paragraph(s) of model code language.
- *** These symbols indicate California deletion of model code language.
- > This symbol indicates California deletion of California language.

SECTION 505 PREMISES IDENTIFICATION

505.1 Address numbers. New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 0.5 inch (12.7 mm).

505.2 Street or road signs. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs.

SECTION 506 KEY BOXES

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be of an approved type and shall contain keys to gain necessary access as required by the fire code official.

506.1.1 Locks. An approved lock shall be installed on gates or similar barriers when required by the fire code official.

506.2 Key box maintenance. The operator of the building shall immediately notify the fire code official and provide the new key when a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

SECTION 507 HAZARDS TO FIRE FIGHTERS

507.1 Trapdoors to be closed. Trapdoors and scuttle covers, other than those that are within a dwelling unit or automatically operated, shall be kept closed at all times except when in use.

507.2 Shaftway markings. Vertical shafts shall be identified as required by this section.

507.2.1 Exterior access to shaftways. Outside openings accessible to the fire department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

507.2.2 Interior access to shaftways. Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high

on a white background. Such warning signs shall be placed so as to be readily discernible.

Exception: Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

507.3 Pitfalls. The intentional design or alteration of buildings to disable, injure, maim or kill intruders is prohibited. No person shall install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers, or dispensers containing highly toxic, toxic, irritant or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill a fire fighter who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance.

SECTION 508 FIRE PROTECTION WATER SUPPLIES

508.1 Required water supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

508.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

508.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.

508.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

508.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method *or Appendix B*.

508.4 Water supply test. The fire code official shall be notified prior to the water supply test. Water supply tests shall be witnessed by the fire code official or approved documentation of the test shall be provided to the fire code official prior to final approval of the water supply system.

508.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 508.5.1 through 508.5.6 *and Appendix C* *or by an approved method*.

508.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official.

Exceptions:

1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).

2. For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183 m).

508.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with approved standards.

508.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with *Title 19 California Code of Regulations Chapter 5*.

508.5.4 Obstruction. Posts, fences, vehicles, growth, trash, storage and other materials or objects shall not be placed or kept near fire hydrants, fire department inlet connections or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

508.5.5 Clear space around hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.

508.5.6 Physical protection. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall comply with Section 312.

SECTION 509 FIRE COMMAND CENTER

509.1 Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *California Building Code and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *California Building Code* or horizontal assembly constructed in accordance with Section 711 of the *California Building Code*, or both. The room shall be a minimum of 96 square feet (9 m²) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.

5. Status indicators and controls for air-handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. *Fire command centers shall not be used for the housing of any boiler, heating unit, generator, combustible storage, or similar hazardous equipment or storage.*

SECTION 510 FIRE DEPARTMENT ACCESS TO EQUIPMENT

510.1 Identification. Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, shall be constructed of durable materials, permanently installed and readily visible.

are installed in accordance with the chimney manufacturer's installation instructions.

603.6.4 Factory-built chimneys. Existing factory-built chimneys that are damaged, corroded or improperly supported shall be repaired or replaced.

603.6.5 Connectors. Existing chimney and vent connectors that are damaged, corroded or improperly supported shall be repaired or replaced.

603.7 Discontinuing operation of unsafe heating appliances. The fire code official is authorized to order that measures be taken to prevent the operation of any existing stove, oven, furnace, incinerator, boiler or any other heat-producing device or appliance found to be defective or in violation of code requirements for existing appliances after giving notice to this effect to any person, owner, firm or agent or operator in charge of the same. The fire code official is authorized to take measures to prevent the operation of any device or appliance without notice when inspection shows the existence of an immediate fire hazard or when imperiling human life. The defective device shall remain withdrawn from service until all necessary repairs or alterations have been made.

603.7.1 Unauthorized operation. It shall be a violation of this code for any person, user, firm or agent to continue the utilization of any device or appliance (the operation of which has been discontinued or ordered discontinued in accordance with Section 603.7), unless written authority to resume operation is given by the fire code official. Removing or breaking the means by which operation of the device is prevented shall be a violation of this code.

603.8 Incinerators. Commercial, industrial and residential-type incinerators and chimneys shall be constructed in accordance with the *California Building Code* and the *California Mechanical Code*.

603.8.1 Residential incinerators. Residential incinerators shall be of an approved type.

603.8.2 Spark arrestor. Incinerators shall be equipped with an effective means for arresting sparks.

603.8.3 Restrictions. Where the fire code official determines that burning in incinerators located within 500 feet (152 m) of mountainous, brush or grass-covered areas will create an undue fire hazard because of atmospheric conditions, such burning shall be prohibited.

603.8.4 Time of burning. Burning shall take place only during approved hours.

603.8.5 Discontinuance. The fire code official is authorized to require incinerator use to be discontinued immediately if the fire code official determines that smoke emissions are offensive to occupants of surrounding property or if the use of incinerators is determined by the fire code official to constitute a hazardous condition.

603.9 Gas meters. Above-ground gas meters, regulators and piping subject to damage shall be protected by a barrier complying with Section 312 or otherwise protected in an approved manner.

SECTION 604 EMERGENCY AND STANDBY POWER SYSTEMS

604.1 Installation. Emergency and standby power systems required by this code or the *California Building Code* shall be installed in accordance with this code, NFPA 110 and NFPA 111. Existing installations shall be maintained in accordance with the original approval.

604.1.1 Stationary generators. Stationary emergency and standby power generators required by this code shall be listed in accordance with UL 2200.

604.2 Where required. Emergency and standby power systems shall be provided where required by Sections 604.2.1 through 604.2.19.4.

604.2.1 Group A occupancies. Emergency power shall be provided for emergency voice/alarm communication systems in Group A occupancies in accordance with Section 907.2.12.2.

604.2.2 Smoke control systems. Standby power shall be provided for smoke control systems in accordance with Section 909.11.

604.2.3 Exit signs. Emergency power shall be provided for exit signs in accordance with Section 1011.5.3

604.2.4 Means of egress illumination. Emergency power shall be provided for means of egress illumination in accordance with Section 1006.3.

604.2.5 Accessible means of egress elevators. Standby power shall be provided for elevators that are part of an accessible means of egress in accordance with Section 1007.4.

604.2.6 Accessible means of egress platform lifts. Standby power in accordance with this section or ASME A18.1 shall be provided for platform lifts that are part of an accessible means of egress in accordance with Section 1007.5.

604.2.7 Horizontal sliding doors. Standby power shall be provided for horizontal sliding doors in accordance with Section 1008.1.3.3.

604.2.8 Semiconductor fabrication facilities. Emergency power shall be provided for semiconductor fabrication facilities in accordance with Section 1803.15.

604.2.9 Membrane structures. Emergency power shall be provided for exit signs in temporary tents and membrane structures in accordance with Section 2403.12.6.1. Standby power shall be provided for auxiliary inflation systems in permanent membrane structures in accordance with the *California Building Code*.

604.2.10 Hazardous materials. Emergency or standby power shall be provided in occupancies with hazardous materials in accordance with Sections 2704.7 and 2705.1.5.

604.2.11 Highly toxic and toxic materials. Emergency power shall be provided for occupancies with highly toxic or toxic materials in accordance with Sections 3704.2.2.8 and 3704.3.2.6.

604.2.12 Organic peroxides. Standby power shall be provided for occupancies with organic peroxides in accordance with Section 3904.1.11.

604.2.13 Pyrophoric materials. Emergency power shall be provided for occupancies with silane gas in accordance with Sections 4106.2.3 and 4106.4.3.

604.2.14 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4645 m²) shall be provided with standby power systems which are capable of operating the emergency voice/alarm communication.

604.2.15 High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access. Standby power, light and emergency systems in high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall comply with the requirements of Sections 604.2.15.1 through 604.2.15.3.

604.2.15.1 Standby power. A standby power system shall be provided. Where the standby system is a generator set inside a building, the system shall be located in a separate room enclosed with 2-hour fire barriers or horizontal assemblies constructed in accordance with the *California Building Code*, or both. System supervision with manual start and transfer features shall be provided at the fire command center.

604.2.15.1.1 Fuel supply. An on-premises fuel supply, sufficient for not less than 2-hour full-demand operation of the system, shall be provided.

Exception: When approved, the system shall be allowed to be supplied by natural gas pipelines.

604.2.15.1.2 Capacity. The standby system shall have a capacity and rating that supplies all equipment required to be operational at the same time. The generating capacity is not required to be sized to operate all of the connected electrical equipment simultaneously.

604.2.15.1.3 Connected facilities. Power and lighting facilities for the fire command center and elevators specified in Sections 403.8 and 403.9 of the *California Building Code*, as applicable, and electrically powered fire pumps required to maintain pressure, shall be transferable to the standby source. Standby power shall be provided for at least one elevator to serve all floors and be transferable to any elevator.

604.2.15.2 Separate circuits and luminaires. Separate lighting circuits and luminaires shall be required to provide sufficient light with an intensity of not less than 1 foot-candle (11 lux) measured at floor level in all means of egress corridors, stairways, smokeproof enclosures, elevator cars and lobbies, and other areas that are clearly a part of the escape route.

604.2.15.2.1 Other circuits. Circuits supplying lighting for the fire command center and mechanical

equipment rooms shall be transferable to the standby source.

604.2.15.3 Emergency systems. Exit signs, exit illumination as required by Chapter 10, and elevator car lighting are classified as emergency systems and shall operate within 10 seconds of failure of the normal power supply and shall be capable of being transferred to the standby source.

Exception: Exit sign, exit and means of egress illumination are permitted to be powered by a standby source in buildings of Group F and S occupancies.

604.2.16 Underground buildings. Emergency and standby power systems in underground buildings covered in Chapter 4 of the *California Building Code* shall comply with Sections 604.2.16.1 and 604.2.16.2.

604.2.16.1 Standby power. A standby power system complying with the *California Electrical Code* shall be provided for standby power loads as specified in Section 604.2.16.1.1.

[B] 604.2.16.1.1 Standby power loads. The following loads are classified as standby power loads:

1. Smoke control system.
2. Ventilation and automatic fire detection equipment for smokeproof enclosures.
3. Fire pumps.
4. Standby power shall be provided for elevators in accordance with Section 3003 of the *California Building Code*.

[B] 604.2.16.1.2 Pickup time. The standby power system shall pick up its connected loads within 60 seconds of failure of the normal power supply.

604.2.16.2 Emergency power. An emergency power system complying with the *California Electrical Code* shall be provided for emergency power loads as specified in Section 604.2.15.2.1.

604.2.16.2.1 Emergency power loads. The following loads are classified as emergency power loads:

1. Emergency voice/alarm communication systems.
2. Fire alarm systems.
3. Automatic fire detection systems.
4. Elevator car lighting.
5. Means of egress lighting and exit sign illumination as required by Chapter 10.

604.2.17 Group I-3 occupancies. Power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies shall be operable by a manual release mechanism at the door, and either emergency power or a remote mechanical operating release shall be provided.

Exception: Emergency power is not required in facilities where provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required as set forth in the *California Building Code*.

considered sprinklered throughout when all the following criteria are met:

1. Automatic fire sprinklers shall be mounted outside the cell a minimum of 6 feet (1829 mm) on center and 12 inches (305 mm) from the wall with quick response sprinkler heads. Where spacing permits, the head shall be centered over the cell door opening.
2. The maximum amount of combustibles, excluding linen and clothing, shall be maintained at three pounds per inmate.
3. For local detention facilities, each individual housing cell shall be provided with a two-way inmate or sound-actuated audio monitoring system for communication directly to the control station serving the cell(s).
4. The provisions of the exception in Section 804.4.2 of the California Building Code shall not apply.

903.2.6 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. Where a Group M fire area exceeds 12,000 square feet (1115 m²);
2. Where a Group M fire area is located more than three stories above grade plane; or
3. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).

903.2.6.1 High-piled storage. An automatic sprinkler system shall be provided as required in Chapter 23 in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

903.2.7 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

Exceptions:

1. Detached one- and two-family dwellings and multiple single-family dwellings (town houses) not more than three stories above grade plane in height with a separate means of egress, unless specifically required by other sections of this code or classified as Group R-4.
2. Group U private garages accessory to a Group R-3 occupancy.
3. Group R-3.1 occupancies not housing bedridden clients, not housing nonambulatory clients above the first floor, and not housing clients above the second floor.
4. Group R-3.1 occupancies housing only one bedridden client and complying with Section 425.8.3.3.
5. Pursuant to Health and Safety Code Section 13113, occupancies housing ambulatory children only, none of whom are mentally ill or mentally retarded, and the buildings or portions thereof in which such children are housed are not more than

two stories in height, and buildings or portions thereof housing such children have an automatic fire alarm system activated by approved smoke detectors.

6. Pursuant to Health and Safety Code Section 13143.6, occupancies licensed for protective social care which house ambulatory clients only, none of whom is a child (under the age of 18 years), or who is elderly (65 years of age or over).

An automatic sprinkler system designed in accordance with Section 903.3.1.3 shall not be utilized in Group R-4.

903.2.8 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet (1115 m²);
2. A Group S-1 fire area is located more than three stories above grade plane; or
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).

903.2.8.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with the California Building Code, as follows:

1. Buildings two or more stories in height, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
2. One-story buildings with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with a repair garage servicing vehicles parked in the basement.

903.2.8.2 Bulk storage of tires. Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet (566 m³) shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

903.2.9 Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 of the California Building Code or where located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

903.2.9.1 Commercial parking garages. An automatic sprinkler system shall be provided throughout buildings used for storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m²).

903.2.10 Windowless stories in all occupancies. An automatic sprinkler system shall be installed in the locations set forth in Sections 903.2.10.1 through 903.2.10.1.3.

Exception: Group R-3 and Group U.

903.2.10.1 Stories and basements without openings. An automatic sprinkler system shall be installed in every story or basement of all buildings where the floor area

exceeds 1,500 square feet (139.4 m²) and where there is not provided at least one of the following types of exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.
2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m²) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.

903.2.10.1.1 Opening dimensions and access. Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that fire fighting or rescue cannot be accomplished from the exterior.

903.2.10.1.2 Openings on one side only. Where openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet (22 860 mm) from such openings, the story shall be equipped throughout with an approved automatic sprinkler system or openings as specified above shall be provided on at least two sides of the story.

903.2.10.1.3 Basements. Where any portion of a basement is located more than 75 feet (22 860 mm) from openings required by Section 903.2.10.1, the basement shall be equipped throughout with an approved automatic sprinkler system.

903.2.10.2 Rubbish and linen chutes. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors. Chute sprinklers shall be accessible for servicing.

903.2.10.3 Buildings 55 feet or more in height. An automatic sprinkler system shall be installed throughout buildings with a floor level having an occupant load of 30 or more that is located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access.

Exceptions:

1. Airport control towers.
2. Open parking structures.
3. Occupancies in Group F-2.

903.2.11 During construction. Automatic sprinkler systems required during construction, alteration and demolition operations shall be provided in accordance with Section 1413.

903.2.12 Other hazards. Automatic sprinkler protection shall be provided for the hazards indicated in Sections 903.2.12.1 and 903.2.12.2.

903.2.12.1 Ducts conveying hazardous exhausts. Where required by the *California Mechanical Code*, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, flammable or combustible materials.

Exception: Ducts where the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).

903.2.12.2 Commercial cooking operations. An automatic sprinkler system shall be installed in a commercial kitchen exhaust hood and duct system where an automatic sprinkler system is used to comply with Section 904.

903.2.13 Other required suppression systems. In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.13 also require the installation of a suppression system for certain buildings and areas.

903.2.14 Motion picture and television production studio sound stages, approved production facilities and production locations.

903.2.14.1 Existing sound stages and approved production facilities. All existing sound stages and approved production facilities equipped with an automatic fire sprinkler system shall be maintained in accordance with the provisions of California Fire Code Chapter 9.

903.2.14.2 New sound stages. All new sound stages shall be equipped with an approved automatic fire sprinkler system. The system shall be installed in accordance with the provisions of the California Fire Code Chapter 9 and shall meet the minimum design requirements of an Extra Hazard, Group 2 system.

903.2.15 Automatic sprinkler system—Existing high-rise buildings. Regardless of any other provisions of these regulations, every existing high-rise building of Type II-B, Type III-B or Type V-B construction shall be provided with an approved automatic sprinkler system conforming to NFPA 13.

903.2.15.1 Existing R-1 and R-2 high-rise buildings fire-extinguishing systems. Automatic fire-extinguishing systems installed in any existing high-rise structure in which a Group R-1 or a Group R-2 occupancy is, located shall have an approved flow indicator electrically interconnected to the required fire alarm system.

903.2.16 Group L occupancies. An automatic fire protection system shall be installed throughout buildings housing Group L occupancies. Sprinkler system design for research laboratories and similar areas of a Group L occupancy shall not be less than that required for Ordinary Hazard Group 2 with a design area of not less than 3,000 square feet (279 m²).

In mixed occupancies, portions of floors or buildings not classified as Group L occupancies shall be provided with sprinkler protection designed of not less than that required for Ordinary Hazard Group 1 with a design area of not less than 3,000 square feet (279 m²).

**TABLE 903.2.13
ADDITIONAL REQUIRED FIRE-EXTINGUISHING SYSTEMS**

SECTION	SUBJECT
914.2.1	Covered malls
914.3.1	High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2, 914.8.5	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
1025.6.2.3	Smoke-protected seating
1208.2	Dry cleaning plants
1208.3	Dry cleaning machines
1504.2	Spray finishing in Group A, E, I or R
1504.4	Spray booths and spray rooms
1505.2	Dip-tank rooms in Group A, I or R
1505.4.1	Dip tanks
1505.9.4	Hardening and tempering tanks
1803.10	HPM facilities
1803.10.1.1	HPM work station exhaust
1803.10.2	HPM gas cabinets and exhausted enclosures
1803.10.3	HPM exit access corridor
1803.10.4	HPM exhaust ducts
1803.10.4.1	HPM noncombustible ducts
1803.10.4.2	HPM combustible ducts
1907.3	Lumber production conveyor enclosures
1908.7	Recycling facility conveyor enclosures
2106.1	Class A and B ovens
2106.2	Class C and D ovens
2209.3.2.6.2	Hydrogen motor fuel-dispensing area canopies
Table 2306.2	Storage fire protection
2306.4	Storage
2703.8.4.1	Gas rooms
2703.8.5.3	Exhausted enclosures
2704.5	Indoor storage of hazardous materials
2705.1.8	Indoor dispensing of hazardous materials
2804.4.1	Aerosol warehouses
2806.3.2	Aerosol display and merchandising areas
2904.5	Storage of more than 1,000 cubic feet of loose combustible fibers

(continued)

**TABLE 903.2.13-continued
ADDITIONAL REQUIRED FIRE-EXTINGUISHING SYSTEMS**

SECTION	SUBJECT
3306.5.2.1	Storage of smokeless propellant
3306.5.2.3	Storage of small arms primers
3404.3.7.5.1	Flammable and combustible liquid storage rooms
3404.3.8.4	Flammable and combustible liquid storage warehouses
3405.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
3704.1.2	Gas cabinets for highly toxic and toxic gas
3704.1.3	Exhausted enclosures for highly toxic and toxic gas
3704.2.2.6	Gas rooms for highly toxic and toxic gas
3704.3.3	Outdoor storage for highly toxic and toxic gas
4106.2.2	Exhausted enclosures or gas cabinets for silane gas
4204.1.1	Pyroxylin plastic storage cabinets
4204.1.3	Pyroxylin plastic storage vaults
4204.2	Pyroxylin plastic storage and manufacturing
California Building Code Section 403	Horse-racing stables
California Building Code Section 431	Pet kennels

903.2.17 Fixed guideway transit systems.

903.2.17.1 Automatic sprinkler system. An automatic sprinkler system shall be installed in all stations of fixed guideway transit systems.

Exceptions:

1. Guideways when the closest sprinkler heads to the guideway are within 3 feet (914 mm) of the edge, over the platform, and spaced 6 feet (1829 mm) on center parallel to the guideway.
2. Station agent booths not exceeding 150 square feet (13.9 m²) in area, when provided with an approved smoke detector connected to the building fire alarm system.
3. Power substations.
4. Machinery rooms, electrical rooms and train control rooms protected by an approved automatic fixed fire-extinguishing system.
5. Open stations.
6. Station platform areas open to three or more sides.

903.2.17.2 Station guideway deluge system. Underground stations and stations in open cuts with walls 5 feet (1524 mm) above the top of the running rail and with

a raised platform shall be provided with an under-vehicle guideway manually activated deluge sprinkler system. In open cut stations, such system shall be provided in guideways which are situated between a raised platform edge and a retaining wall.

903.2.17.2.1 Systems shall be provided along the entire length of track at each station platform.

903.2.17.2.2 Deluge nozzles with caps shall be located in the approximate center of track with spacing designed to completely wet the undersides of the vehicle at the applied density.

903.2.17.2.3 System density shall be a minimum of 0.19 gallon per minute (gpm) per square foot (0.72 L/m per m²) for the design area. When more than one zone is provided, two adjacent zones are required to be considered operating for calculating purposes.

903.2.17.2.4 Deluge systems shall be directly connected to a water supply capable of supplying the required flow rate for a minimum 30-minute duration.

903.2.17.2.5 Controls or manually operable valves shall be in a location acceptable to the fire code official. All deluge systems shall be monitored by the station fire alarm system.

903.2.17.2.6 Each valve shall be monitored by a separate circuit. The alarm panel shall be located in an area normally occupied by station personnel or signals shall be transmitted to the operations control center (OCC).

903.3 Installation requirements. Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.7.

903.3.1 Standards. Sprinkler systems shall be designed and installed in accordance with Sections 903.3.1.1, 903.3.1.2 or 903.3.1.3.

903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.

903.3.1.1.1 Exempt locations. In other than Group I-2, I-2.1, or I-3 occupancies, automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the

contents, when approved by the fire code official.

3. Generator and transformer rooms 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 2 hours.
4. In rooms or areas that are of noncombustible construction with wholly noncombustible contents.

903.3.1.2 NFPA 13R sprinkler systems. Where allowed in buildings of Group R, up to and including four stories in height, automatic sprinkler systems shall be installed throughout in accordance with NFPA 13R.

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

903.3.1.3 NFPA 13D sprinkler systems. Where allowed, automatic sprinkler systems installed in one- and two-family dwellings shall be installed throughout in accordance with NFPA 13D.

903.3.2 Quick-response and residential sprinklers. Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing patient sleeping units in Group I-2 in accordance with the *California Building Code*.
2. Dwelling units and sleeping units in Group R and I-1 occupancies.
3. Light-hazard occupancies as defined in NFPA 13.

903.3.3 Obstructed locations. Automatic sprinklers shall be installed with due regard to obstructions that will delay activation or obstruct the water distribution pattern. Automatic sprinklers shall be installed in or under covered kiosks, displays, booths, concession stands, or equipment that exceeds 4 feet (1219 mm) in width. Not less than a 3-foot (914 mm) clearance shall be maintained between automatic sprinklers and the top of piles of combustible fibers.

Exception: Kitchen equipment under exhaust hoods protected with a fire-extinguishing system in accordance with Section 904.

903.3.4 Actuation. Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

903.3.5 Water supplies. Water supplies for automatic sprinkler systems shall comply with this section and the

standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with *Health and Safety Code 13114.7*.

903.3.5.1 Domestic services. Where the domestic service provides the water supply for the automatic sprinkler system, the supply shall be in accordance with this section.

903.3.5.1.1 Limited area sprinkler systems. Limited area sprinkler systems serving fewer than 20 sprinklers on any single connection are permitted to be connected to the domestic service where a wet automatic standpipe is not available. Limited area sprinkler systems connected to domestic water supplies shall comply with each of the following requirements:

1. Valves shall not be installed between the domestic water riser control valve and the sprinklers.

Exception: An approved indicating control valve supervised in the open position in accordance with Section 903.4.

2. The domestic service shall be capable of supplying the simultaneous domestic demand and the sprinkler demand required to be hydraulically calculated by NFPA 13, NFPA 13R or NFPA 13D.

903.3.5.1.2 Residential combination services. A single combination water supply shall be allowed provided that the domestic demand is added to the sprinkler demand as required by NFPA 13R.

903.3.5.2 Secondary water supply. A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings *and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access* in Seismic Design Category C, D, E or F as determined by the *California Building Code*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

903.3.6 Hose threads. Fire hose threads and fittings used in connection with automatic sprinkler systems shall be as prescribed by the fire code official.

903.3.7 Fire department connections. The location of fire department connections shall be approved by the fire code official.

903.4 Sprinkler system monitoring and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised.

Exceptions:

1. Automatic sprinkler systems protecting one- and two-family dwellings.

2. Limited area systems serving fewer than 20 sprinklers.
3. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

903.4.1 Signals. Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved central station, remote supervising station or proprietary supervising station as defined in NFPA 72 or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

903.4.2 Alarms. Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an approved location. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

903.4.3 Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings *and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access*.

903.5 Testing and maintenance. Sprinkler systems shall be tested and maintained in accordance with Section 901.

903.6 Existing buildings. The provisions of this section are intended to provide a reasonable degree of safety in existing structures not complying with the minimum requirements of the *California Building Code* by requiring installation of an automatic fire-extinguishing system.

903.6.1 Pyroxylin plastics. All structures occupied for the manufacture or storage of articles of cellulose nitrate (pyroxylin) plastic shall be equipped with an approved automatic fire-extinguishing system. Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging 1.66 gallons per minute per square foot (68 L/min/m²) over the area of the vault.

SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

904.1 General. Automatic fire-extinguishing systems, other than automatic sprinkler systems, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

904.2 Where required. Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the fire code official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions allowed by other requirements of this code.

904.2.1 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Section 609 to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

904.3 Installation. Automatic fire-extinguishing systems shall be installed in accordance with this section.

904.3.1 Electrical wiring. Electrical wiring shall be in accordance with the *California Electrical Code*.

904.3.2 Actuation. Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.11.1.

904.3.3 System interlocking. Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents, and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

904.3.4 Alarms and warning signs. Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible, visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun. Audible signals shall be in accordance with Section 907.10.2.

904.3.5 Monitoring. Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

904.4 Inspection and testing. Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

904.4.1 Inspection. Prior to conducting final acceptance tests, the following items shall be inspected:

1. Hazard specification for consistency with design hazard.
2. Type, location and spacing of automatic- and manual-initiating devices.
3. Size, placement and position of nozzles or discharge orifices.
4. Location and identification of audible and visible alarm devices.
5. Identification of devices with proper designations.
6. Operating instructions.

904.4.2 Alarm testing. Notification appliances, connections to fire alarm systems, and connections to approved supervising stations shall be tested in accordance with this section and Section 907 to verify proper operation.

904.4.2.1 Audible and visible signals. The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

904.4.3 Monitor testing. Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from automatic fire-extinguishing systems.

904.5 Wet-chemical systems. Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5* and NFPA 17A and their listing.

904.5.1 System test. Systems shall be inspected and tested for proper operation at 6-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.

904.5.2 Fusible link maintenance. Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

904.6 Dry-chemical systems. Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5* and NFPA 17 and their listing.

904.6.1 System test. Systems shall be inspected and tested for proper operation at 6-month intervals. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing system units shall be weighed, and the required amount of agent verified. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals indicated by the manufacturer.

904.6.2 Fusible link maintenance. Fixed temperature-sensing elements shall be maintained to ensure proper operation of the system.

904.7 Foam systems. Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5 and NFPA 11, NFPA 11A and NFPA 16* and their listing.

904.7.1 System test. Foam-extinguishing systems shall be inspected and tested at intervals in accordance with *Title 19 California Code of Regulations, Chapter 5*.

904.8 Carbon dioxide systems. Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5 and NFPA 12* and their listing.

904.8.1 System test. Systems shall be inspected and tested for proper operation at 12-month intervals.

904.8.2 High-pressure cylinders. High-pressure cylinders shall be weighed and the date of the last hydrostatic test shall be verified at 6-month intervals. Where a container shows a loss in original content of more than 10 percent, the cylinder shall be refilled or replaced.

904.8.3 Low-pressure containers. The liquid-level gauges of low-pressure containers shall be observed at one-week intervals. Where a container shows a content loss of more than 10 percent, the container shall be refilled to maintain the minimum gas requirements.

904.8.4 System hoses. System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. At five-year intervals, all hoses shall be tested.

904.8.4.1 Test procedure. Hoses shall be tested at not less than 2,500 pounds per square inch (psi) (17 238 kPa) for high-pressure systems and at not less than 900 psi (6206 kPa) for low-pressure systems.

904.8.5 Auxiliary equipment. Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure that such components are in proper operating condition.

904.9 Halon systems. Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5 and NFPA 12A* and their listing.

904.9.1 System test. Systems shall be inspected and tested for proper operation at 12-month intervals.

904.9.2 Containers. The extinguishing agent quantity and pressure of containers shall be checked at 6-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure (adjusted for temperature) of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

904.9.3 System hoses. System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be

replaced or tested. At 5-year intervals, all hoses shall be tested.

904.9.3.1 Test procedure. For Halon 1301 systems, hoses shall be tested at not less than 1,500 psi (10 343 kPa) for 600 psi (4137 kPa) charging pressure systems and not less than 900 psi (6206 kPa) for 360 psi (2482 kPa) charging pressure systems. For Halon 1211 hand-hose line systems, hoses shall be tested at 2,500 psi (17 238 kPa) for high-pressure systems and 900 psi (6206 kPa) for low-pressure systems.

904.9.4 Auxiliary equipment. Auxiliary and supplementary components, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, shall be manually operated at 12-month intervals to ensure such components are in proper operating condition.

904.10 Clean-agent systems. Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with *Title 19 California Code of Regulations, Chapter 5 and NFPA 2001* and their listing.

904.10.1 System test. Systems shall be inspected and tested for proper operation at 12-month intervals.

904.10.2 Containers. The extinguishing agent quantity and pressure of the containers shall be checked at 6-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container.

904.10.3 System hoses. System hoses shall be examined at 12-month intervals for damage. Damaged hoses shall be replaced or tested. All hoses shall be tested at 5-year intervals.

904.11 Commercial cooking systems. *Commercial cooking equipment that produces grease laden vapors shall be provided with a Type I hood, in accordance with the California Mechanical Code, and an automatic fire-extinguishing system that is listed and labeled for its intended use as follows:*

1. *Wet-chemical extinguishing system, complying with UL 300.*
2. *Carbon dioxide extinguishing systems.*
3. *Automatic fire sprinkler systems.*

All existing dry-chemical and wet-chemical extinguishing systems shall comply with UL 300, no later than the second required servicing of the system following the effective date of this section.

Exception: *Public school kitchens, without deep-fat fryers, shall be upgraded to a UL 300 compliant system during state-funded modernization projects that are under the jurisdiction of the Division of the State Architect.*

All systems shall be installed in accordance with the California Mechanical Code, appropriate adopted standards, their listing and the manufacturers' installation instructions.

Exception: Factory-built commercial cooking recirculating systems that are tested, *listed, labeled and installed* in accordance with UL 710B.

904.11.1 Manual system operation. A manual actuation device shall be located at or near a means of egress from the cooking area a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: Automatic sprinkler systems shall not be required to be equipped with manual actuation means.

904.11.2 System interconnection. The actuation of the fire extinguishing system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

904.11.3 Carbon dioxide systems. When carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). Dampers shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. When the damper is installed at the top of the duct, the top nozzle shall be immediately below the damper. Automatic carbon dioxide fire-extinguishing systems shall be sufficiently sized to protect all hazards venting through a common duct simultaneously.

904.11.3.1 Ventilation system. Commercial-type cooking equipment protected by an automatic carbon dioxide extinguishing system shall be arranged to shut off the ventilation system upon activation.

904.11.4 Special provisions for automatic sprinkler systems. Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified.

904.11.4.1 Listed sprinklers. Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, listed for that application and installed in accordance with their listing.

904.11.5 Portable fire extinguishers for commercial cooking equipment. Portable fire extinguishers shall be provided *and maintained in accordance with Title 19 California Code of Regulations, Chapter 3.*

904.11.5.1 Portable fire extinguishers for solid fuel cooking appliances. All solid fuel cooking appliances, whether or not under a hood, with fireboxes 5 cubic feet (0.14 m³) or less in volume shall have a minimum 2.5-gallon (9 L) or two 1.5-gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with Section 904.11.5.

904.11.5.2 Class K portable fire extinguishers for deep fat fryers. When hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided *in accordance with Title 19 California Code of Regulations, Chapter 3* as follows:

1. For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each. One Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity.
2. For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: One additional Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity shall be provided.
3. For individual fryers exceeding 6 square feet (0.55 m²) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

904.11.6 Operations and maintenance. Commercial cooking systems shall be operated and maintained in accordance with *Title 19 California Code of Regulations, Chapter 5* and this section.

904.11.6.1 Ventilation system. The ventilation system in connection with hoods shall be operated at the required rate of air movement, and classified grease filters shall be in place when equipment under a kitchen grease hood is used.

904.11.6.2 Grease extractors. Where grease extractors are installed, they shall be operated when the commercial-type cooking equipment is used.

904.11.6.3 Cleaning. Hoods, grease-removal devices, fans, ducts and other appurtenances shall be cleaned at intervals necessary to prevent the accumulation of grease. Cleanings shall be recorded, and records shall state the extent, time and date of cleaning. Such records shall be maintained on the premises.

904.11.6.4 Extinguishing system service. Automatic fire-extinguishing systems shall be serviced at least every 6 months and after activation of the system. Inspection shall be by qualified individuals, and a certificate of inspection shall be forwarded to the fire code official upon completion.

904.11.6.5 Fusible link and sprinkler head replacement. Fusible links and automatic sprinkler heads shall be replaced at least annually, and other protection devices shall be serviced or replaced in accordance with the manufacturer's instructions.

Exception: Frangible bulbs are not required to be replaced annually.

SECTION 905 STANDPIPE SYSTEMS

905.1 General. Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire

ness and Professions Code, where the licensee participates in the making of the disclosure required to be made pursuant to this section with actual knowledge of the falsity of the disclosure.

(g) Except as otherwise provided in this section, this section shall not be deemed to create or imply a duty upon a licensee, as defined in Section 10011 of the Business and Professions Code, or upon any agent of any party to a transfer of title, including any person or entity acting in the capacity of an escrow, to monitor or ensure compliance with this section.

(h) Local ordinances requiring smoke detectors in single-family dwellings may be enacted or amended. However, the ordinances shall satisfy the minimum requirements of this section.

(i) For the purposes of this section, "single-family dwelling" does not include a manufactured home as defined in Section 18007, a mobile home as defined in Section 18008, or a commercial coach as defined in Section 18001.8.

(j) This section shall not apply to the installation of smoke detectors in dwellings intended for human occupancy, as defined in and regulated by Section 13113.7 of the Health and Safety Code, as added by Senate Bill No. 1448 in the 1983-84 Regular Session.

907.2.11 Special amusement buildings. An approved automatic smoke detection system shall be provided in special amusement buildings in accordance with this section.

Exception: In areas where ambient conditions will cause a smoke detection system to alarm, an approved alternative type of automatic detector shall be installed.

907.2.11.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any 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 907.2.11.2.

907.2.11.2 System response. The activation of two or more smoke detectors, a single smoke detector with alarm verification, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause illumination of the means of egress with light of not less than 1 foot-candle (11 lux) at the walking surface level;
2. Stop any conflicting or confusing sounds and visual distractions; and
3. Activate an approved directional exit marking that will become apparent in an emergency.

Such system response shall also include activation of a prerecorded message, clearly audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound

which is distinctive from other sounds used during normal operation.

The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.

907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with NFPA 72 and be audible throughout the entire special amusement building.

907.2.12 High-rise buildings. High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section 907.2.12.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *California Building Code*.
2. Open parking garages in accordance with Section 406.3 of the *California Building Code*.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *California Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *California Building Code*.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *California Building Code*.

907.2.12.1 Automatic fire detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, elevator machine rooms, and in elevator lobbies.
2. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m³/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
3. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a listed smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4 m³/s) and serving not more than 10 air-inlet openings.

907.2.12.2 Emergency voice/alarm communication system. The operation of any automatic fire detector, sprinkler water-flow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation on a minimum of the alarming floor, the floor above and the floor below in accordance with the building's fire safety and evacuation plans required by Section 404. Speakers shall be provided throughout the building by paging zones. As a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

907.2.12.2.1 Manual override. A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

907.2.12.2.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages through paging zones on a selective and all-call basis.

907.2.12.2.3 Standard. The emergency voice/alarm communication system shall be designed and installed in accordance with NFPA 72.

907.2.12.3 Fire department communication system. An approved two-way, fire department communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 509 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.

Exception: Fire department radio systems where approved by the fire department.

907.2.13 Atriums connecting more than two stories. A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with Section 907.7. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.2.12.2.

907.2.14 High-piled combustible storage areas. An automatic fire detection system shall be installed throughout high-piled combustible storage areas where required by Section 2306.5.

907.2.15 Delayed egress locks. Where delayed egress locks or devices are installed on means of egress doors in accordance with Section 1008.1.8.6, an automatic smoke

detection system shall be installed as required by that section.

907.2.15.1 *In other than Group I occupancies and Group R-4 occupancies for single-story buildings, smoke detectors shall be installed at ceilings throughout all occupied areas and mechanical/electrical spaces. For multiple-story buildings, smoke detectors shall be installed throughout all occupied areas and mechanical/electrical spaces for the story where delayed egress devices are installed. Additional detectors are required on adjacent stories where occupants of those stories utilize the same means of egress.*

907.2.15.2 For Group I. *Smoke detectors shall be installed at ceilings throughout all occupied areas, restrooms, closets, storage rooms and mechanical/electrical spaces of smoke compartments where delayed egress locks are installed. Heat detectors may be used in kitchens, laundry rooms and rooms of similar use. Additional detectors are required in adjacent smoke compartments where occupants of those compartments utilize the same means of egress.*

907.2.15.3 For Group R-4. *Occupancies licensed as residential care facilities for the elderly, and housing clients with Alzheimer's disease or dementia residential facilities, smoke detectors shall be installed at ceilings throughout all occupied areas, restrooms, closets, storage rooms and mechanical/electrical spaces. Heat detectors may be used in kitchens, laundry rooms and rooms of similar use.*

907.2.16 Aerosol storage uses. Aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system where required by this code.

907.2.17 Lumber, wood structural panel and veneer mills. Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

907.2.18 Underground buildings with smoke exhaust systems. Where a smoke exhaust system is installed in an underground building in accordance with the *California Building Code*, automatic fire detectors shall be provided in accordance with this section.

907.2.18.1 Smoke detectors. A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a

power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated: in existing buildings where no construction or construction, requiring a permit, not exceeding \$1000 has taken place; in buildings that are not served from a commercial power source; and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

907.3.2.4 Group R-3.1. *In all facilities housing a bedridden client, smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall be electrically interconnected so as to cause all smoke alarms to sound a distinctive alarm signal upon actuation of any single smoke alarm. Such alarm signal shall be audible throughout the facility at a minimal level of 15 db above ambient noise level. These devices need not be interconnected to any other fire alarm device, have a control panel, or be electrically supervised or provided with emergency power.*

907.4 Manual fire alarm boxes. Manual fire alarm boxes shall be installed in accordance with Sections 907.4.1 through 907.4.5.

907.4.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960 mm).

Exception: *When individual dwelling units are served by a single exit stairway, additional boxes at other than the ground floor may be omitted.*

907.4.2 Height. The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) measured vertically, from the floor level to the [DSA-AC] highest point of the activating handle or lever of the box. [DSA-AC] Manual fire alarm boxes shall also comply with Chapter 11B, Section 1117B.6 item 4 of the California Building Code.

Exception: [DSA-AC] *In existing buildings there is no requirement to retroactively relocate existing manual fire alarm boxes to a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) from the floor level to the activating handle or lever of the box.*

907.4.3 Color. Manual fire alarm boxes shall be red in color.

907.4.4 Signs. Where fire alarm systems are not monitored by a supervising station, an approved permanent sign shall be installed adjacent to each manual fire alarm box that

reads: WHEN ALARM SOUNDS—CALL FIRE DEPARTMENT.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

907.4.5 Operation. *Manual fire alarm boxes shall be operable with one hand including boxes with protective covers.*

907.4.6 Protective covers. The fire code official is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless approved. *Each cover shall not exceed a combined projection over 4 inches from the surface of the wall into walks, halls, corridors, passageways or aisles.*

907.5 Power supply. The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

907.6 Wiring. Wiring shall comply with the requirements of the California Electrical Code and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

907.7 Activation. Where an alarm notification system is required by another section of this code, it shall be activated by:

1. Automatic fire alarm system.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.

907.8 Presignal system. Presignal systems shall not be installed unless approved by the fire code official and the fire department. Where a presignal system is installed, 24-hour personnel supervision shall be provided at a location approved by the fire department, in order that the alarm signal can be actuated in the event of fire or other emergency.

907.9 Zones. *Fire alarm systems shall be divided into zones where required by this section. For the purposes of annunciation and notification, zoning shall be in accordance with the following:*

1. *Where the fire-protective signaling system serves more than one building, each building shall be considered as a separate zone.*
2. *Each floor of a building shall be considered as a separate zone.*
3. *Each section of floor of a building that is separated by fire walls or by horizontal exits shall be considered as a separate zone.*
4. *Each zone shall not exceed 22,500 square feet (2090 m²). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.*

Exception: *Automatic sprinkler system zones shall not exceed the area permitted by NFPA 13.*

5. For Group I-3 occupancies each cell complex shall be considered a separate zone.
6. Annunciation shall be further divided into zones where deemed necessary by the enforcing agency.

907.9.1 Annunciation. Alarm, supervisory and trouble signals shall be annunciated in the main control unit by means of an audible signal and a visual display in accordance with NFPA 72. Identification of the type of alarm and supervisory initiating devices, such as manual, automatic, sprinkler waterflow, sprinkler valve supervisory, fire-pump supervisory, etc., shall be separately indicated.

Exception: Group R-3 occupancies.

907.9.2 Annunciator panel. An annunciator panel complying with Section 907.8.1 and the associated controls shall be provided in an approved remote location where deemed necessary by the enforcing agency. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible alarm-silencing switch.

907.9.3 High-rise buildings. In high-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for all of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

907.9.4 Notification zoning. Upon activation of initiating devices where occupant notification is required for evacuation, all notification zones shall operate simultaneously throughout the building.

Exceptions:

1. High-rise buildings as permitted in Section 907.2.12.2.
2. In hospitals and convalescent facilities with staff-alerting notification appliances or voice/alarm communication, zoning shall be in accordance with the approved fire plan.
3. Detention facilities.
4. Upon approval by the fire code official in buildings which are sprinklered throughout, specific notification zoning shall be permitted where the notification zones are separated by a minimum of a 2-hour fire barrier and 2-hour fire-resistive floor assembly. The system shall have the capability to activate all other notification zones by automatic and manual means.
5. Upon approval by the fire code official in buildings which are sprinklered throughout, specific notification zoning shall be permitted where the activated initiating device or fire extinguishing system is separated from any nonactive notification zones by a minimum horizontal distance of 300 feet. The system shall have the capability to activate all other notification zones by automatic and manual means.

notification zoning shall be permitted where the activated initiating device or fire extinguishing system is separated from any nonactive notification zones by a minimum horizontal distance of 300 feet. The system shall have the capability to activate all other notification zones by automatic and manual means.

907.10 Alarm notification appliances. Alarm notification appliances shall be provided and shall be listed for their purpose.

907.10.1 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.10.1.1 through 907.10.1.5.

Exceptions:

1. In other than Groups I-2 and I-2.1, visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in enclosed exit stairways, exterior exit stairs, and exterior exit ramps.

907.10.1.1 Public and common use areas. Visible alarm notification appliances shall be provided in public use areas and common use areas including but not limited to:

1. Sanitary facilities including restrooms, bathrooms and shower rooms.
2. Corridors.
3. Music practice rooms.
4. Band rooms.
5. Gymnasiums.
6. Multipurpose rooms.
7. Occupational shops.
8. Occupied rooms where ambient noise impairs hearing of the fire alarm.
9. Lobbies.
10. Meeting rooms.
11. Classrooms.

907.10.1.2 Employee work areas. Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with a minimum of 20 percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing impaired employee(s).

907.10.1.3 Groups I-1 and R-1. Group I-1 and R-1 sleeping units in accordance with Table 907.10.1.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

based on the analysis in accordance with Section 909.4 and this section.

909.9.1 Factors considered. The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire, and whether the fire is likely to be steady or unsteady.

909.9.2 Separation distance. Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

909.9.3 Heat-release assumptions. The analysis shall make use of best available data from approved sources and shall not be based on excessively stringent limitations of combustible material.

909.9.4 Sprinkler effectiveness assumptions. A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

909.10 Equipment. Equipment including, but not limited to, fans, ducts, automatic dampers and balance dampers shall be suitable for their intended use, suitable for the probable exposure temperatures that the rational analysis indicates, and as approved by the fire code official.

909.10.1 Exhaust fans. Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by:

$$T_s = (Q_c / mc) + (T_a) \quad \text{(Equation 9-3)}$$

where:

c = Specific heat of smoke at smokelayer temperature, Btu/lb°F • (kJ/kg • K).

m = Exhaust rate, pounds per second (kg/s).

Q_c = Convective heat output of fire, Btu/s (kW).

T_a = Ambient temperature, °F (K).

T_s = Smoke temperature, °F (K).

Exception: Reduced T_s as calculated based on the assurance of adequate dilution air.

909.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *California Mechanical Code*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the *California Mechanical Code* and which are constructed of approved fire-resistance-rated materials.

909.10.3 Equipment, inlets and outlets. Equipment shall be located so as to not expose uninvolved portions of the

building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

909.10.4 Automatic dampers. Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved recognized standards.

909.10.5 Fans. In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the structural design requirements of Chapter 16 of the *California Building Code*. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts) as determined from measurement of actual current draw and shall have a minimum service factor of 1.15.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power system. Secondary power shall be from an approved standby source complying with the *California Electrical Code*. The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear and shall be enclosed in a room constructed of not less than 1-hour fire barriers ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with this code or the *California Electrical Code*.

909.11.1 Power sources and power surges. Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptable power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

909.12 Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override, the presence of power downstream of all disconnects and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

909.12.1 Wiring. In addition to meeting requirements of the *California Electrical Code*, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

909.12.2 Activation. Smoke control systems shall be activated in accordance with this section.

909.12.2.1 Pressurization, airflow or exhaust method.

Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

909.12.2.2 Passive method. Passive smoke control systems actuated by approved spot-type detectors listed for releasing service shall be permitted.

909.12.3 Automatic control. Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned automatic sprinkler system complying with Section 903.3.1.1, manual controls that are readily accessible to the fire department, and any smoke detectors required by the engineering analysis.

909.13 Control air tubing. Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

909.13.1 Materials. Control air tubing shall be hard drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type, in accordance with ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100°F (593°C) and liquidus below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices, provided all of the following conditions are met:

1. Tubing shall be listed by an approved agency for flame and smoke characteristics.
2. Tubing and the connected device shall be completely enclosed within a galvanized or paint-grade steel enclosure of not less than 0.030 inch (0.76 mm) (No. 22 galvanized sheet gage) thickness. Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male-barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within enclosure. Tubing bridging cabinet and door or moveable device shall be of sufficient length to avoid tension and excessive stress. Tubing shall be

protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

909.13.2 Isolation from other functions. Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

909.13.3 Testing. Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

909.14 Marking and identification. The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the fire code official, the fire department and in the fire command center in a format and manner approved by the fire chief.

909.16 Fire-fighter's smoke control panel. A fire-fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a fire command center complying with Section 509 in high-rise buildings, *Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access* or buildings with smoke-protected assembly seating. In all other buildings, the fire-fighter's smoke control panel shall be installed in an approved location adjacent to the fire alarm control panel. The fire-fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3.

909.16.1 Smoke control systems. Fans within the building shall be shown on the fire-fighter's control panel. A clear indication of the direction of airflow and the relationship of components shall be displayed. Status indicators shall be provided for all smoke control equipment, annunciated by fan and zone and by *approved* indicators as follows:

1. Fans, dampers and other operating equipment in their normal status—WHITE.
2. Fans, dampers and other operating equipment in their off or closed status—RED.
3. Fans, dampers and other operating equipment in their on or open status—GREEN.
4. Fans, dampers and other operating equipment in a fault status—YELLOW/AMBER.

909.16.2 Smoke control panel. The fire-fighter's control panel shall provide control capability over the complete smoke-control system equipment within the building as follows:

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can also be controlled from other sources within the building. This includes stairway pressurization fans; smoke exhaust fans; supply, return and exhaust fans; elevator shaft fans; and other operating equipment used or intended for smoke control purposes.

SECTION 914

FIRE PROTECTION BASED ON SPECIAL DETAILED REQUIREMENTS OF USE AND OCCUPANCY

914.1 General. This section shall specify where fire protection systems are required based on the detailed requirements of use and occupancy of the *California Building Code*.

914.2 Covered mall buildings. Covered mall buildings shall comply with Sections 914.2.1 through 914.2.4.

914.2.1 Automatic sprinkler system. The covered mall building and buildings connected shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.1.1, which shall comply with the following:

1. The automatic sprinkler system shall be complete and operative throughout occupied space in the covered mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternate protection.
2. Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.

Exception: An automatic sprinkler system shall not be required in spaces or areas of open parking garages constructed in accordance with Section 406.2 of the *California Building Code*.

914.2.2 Standpipe system. The covered mall building shall be equipped throughout with a standpipe system in accordance with Section 905.

914.2.3 Emergency voice/alarm communication system. Covered mall buildings exceeding 50,000 square feet (4645 m²) in total floor area shall be provided with an emergency voice/alarm communication system. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.12.2.

914.2.4 Fire department access to equipment. Rooms or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems or other detection, suppression or control elements shall be identified for use by the fire department.

914.3 High-rise buildings. High-rise buildings and Group I-2 occupancies having occupied floors located more than 75 feet above the lowest level of fire department vehicle access shall comply with Sections 914.3.1 through 914.3.5.

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2. A sprinkler water-flow alarm-initiating device and a control valve with a supervisory signal-initiating device shall be provided at the lateral connection to the riser on each floor.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

1. Open parking garages in accordance with Section 406.3 of the *California Building Code*.
2. Telecommunication equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by fire barriers consisting of not less than 1-hour fire-resistance-rated walls and 2-hour fire-resistance-rated floor/ceiling assemblies.

914.3.2 Automatic fire detection. Smoke detection shall be provided in accordance with Section 907.2.12.1.

914.3.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system shall be provided in accordance with Section 907.2.12.2.

914.3.4 Fire department communication system. A two-way fire department communication system shall be provided for fire department use in accordance with Section 907.2.12.3.

914.3.5 Fire command. A fire command center complying with Section 509 shall be provided in a location approved by the fire department.

914.3.6 Smoke control.

914.3.6.1 Smoke control system. All portions of high-rise buildings shall be provided with a smoke control system in accordance with *California Building Code*, Section 909.

914.3.6.2 Smokeproof exit enclosures. Every exit enclosure in high-rise buildings shall comply with Sections 909.20 and 1020.1.7. Every required stairway in Group I-2 occupancies serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1020.1.7.

914.4 Atriums. Atriums shall comply with Sections 914.4.1 and 914.4.2.

914.4.1 Automatic sprinkler system. An approved automatic sprinkler system shall be installed throughout the entire building.

Exceptions:

1. That area of a building adjacent to or above the atrium need not be sprinklered, provided that portion of the building is separated from the atrium portion by not less than a 2-hour fire-resistance-rated fire barrier or horizontal assembly, or both.
2. Where the ceilings of the atrium are more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

914.4.2 Fire alarm system. A fire alarm system shall be provided where required by Section 907.2.13.

914.5 Underground buildings. Underground buildings shall comply with Sections 914.5.1 through 914.5.6.

914.5.1 Automatic sprinkler system. The highest level of exit discharge serving the underground portions of the

building and all levels below shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Water-flow switches and control valves shall be supervised in accordance with Section 903.4.

914.5.2 Smoke control system. A smoke control system is required to control the migration of products of combustion in accordance with Section 909 and provisions of this section. Smoke control shall restrict movement of smoke to the general area of fire origin and maintain means of egress in a usable condition.

914.5.3 Compartment smoke control system. Where compartmentation is required by Section 405.4 of the *California Building Code*, each compartment shall have an independent smoke-control system. The system shall be automatically activated and capable of manual operation in accordance with Section 907.2.18.

914.5.4 Fire alarm system. A fire alarm system shall be provided where required by Section 907.2.19.

914.5.5 Public address. A public address system shall be provided where required by Section 907.2.19.1.

914.5.6 Standpipe system. The underground building shall be provided throughout with a standpipe system in accordance with Section 905.

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

914.6.1 Automatic sprinkler system. Stages shall be equipped with an automatic fire-extinguishing system in accordance with Chapter 9. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by not less than $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum board.
2. Sprinklers are not required for stages 1,000 square feet (93 m²) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

914.6.2 Standpipe system. Standpipe systems shall be provided in accordance with Section 905.

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

914.7.1 Automatic sprinkler system. Special amusement buildings shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where the special amusement building is temporary, the

sprinkler water supply shall be of an approved temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement building is less than 1,000 square feet (93 m²) and the travel distance from any point to an exit is less than 50 feet (15 240 mm).

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

914.8 Aircraft-related occupancies. Aircraft-related occupancies shall comply with Sections 914.8.1 through 914.8.5.

914.8.1 Automatic fire detection systems. Airport traffic control towers shall be provided with an automatic fire detection system installed in accordance with Section 907.2.

914.8.2 Fire suppression. Aircraft hangars shall be provided with fire suppression as required by NFPA 409.

Exception: Group II hangars, as defined in NFPA 409, storing private aircraft without major maintenance or overhaul are exempt from foam suppression requirements.

914.8.3 Finishing. The process of “doping,” involving the use of a volatile flammable solvent, or of painting shall be carried on in a separate detached building equipped with automatic fire-extinguishing equipment in accordance with Section 903.

914.8.4 Residential aircraft hangar smoke alarms. Smoke alarms shall be provided within residential aircraft hangars in accordance with Section 907.2.21.

914.8.5 Aircraft paint hangar fire suppression. Aircraft paint hangars shall be provided with fire suppression as required by NFPA 409.

914.9 Application of flammable finishes. An automatic fire-extinguishing system shall be provided in all spray, dip and immersing spaces and storage rooms, and shall be installed in accordance with Chapter 9.

914.10 Drying rooms. Drying rooms designed for high-hazard materials and processes, including special occupancies as provided for in Chapter 4 of the *California Building Code*, shall be protected by an approved automatic fire-extinguishing system complying with the provisions of Chapter 9.

914.11 Motion picture and television production studio sound stages, approved production facilities and production locations.

914.11.1 Existing sound stages and approved production facilities. All existing sound stages and approved production facilities equipped with an automatic fire sprinkler system shall be maintained in accordance with the provisions in this chapter.

914.11.2 New sound stages. All new sound stages shall be equipped with an approved automatic fire sprinkler system. The system shall be installed in accordance with the provisions in this chapter and shall meet the minimum design requirements of an Extra Hazard, Group 2 system.

HISTORY NOTE APPENDIX

CALIFORNIA FIRE CODE

Title 24, Part 9, California Code of Regulations (CCR)

For prior history, see the History Note Appendix to the California Fire Code 2001 Triennial Edition Published in April 2002 – December 2005, and effective November 1, 2002.

1. SFM 04/06 – Adoption of the 2006 edition of the *International Fire Code* published by the International Code Council, for incorporation into the *California Fire Code*, CCR, Title 24, Part 9 with amendments for State Fire Marshal regulated occupancies.

This item approved by the Building Standards Commission on January 30, 2007, and effective on January 1, 2008.

2. DSA-AC 07/06 – Adoption of the 2006 edition of the *International Fire Code* published by the International Code Council, for incorporation into the *California Fire Code*, CCR, Title 24, Part 9 with amendments for the Division of the State Architect-Access Compliance regulated occupancies.

This item approved by the Building Standards Commission on January 30, 2007, and effective on January 1, 2008.

3. (SFM EF 02-08) Amend Title 24, Part 9, Chapter 5, Chapter 6, Chapter 9. Approved as an emergency by the California Building Standards Commission on May 21, 2008. Filed with the Secretary of State on May 23, 2008.
4. (SFM 01-08) Change without regulatory effect to Section 903. Filed with the Secretary of State on July 14, 2008.

