

STANDARD DETAILS & SPECIFICATIONS

SUBJECT: Construction Site Fire Safety

Spec. No.	<u>CFMO-C7</u>
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Approved By	<u>IAS</u>
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SCOPE

This Standard is intended to prescribe minimum safeguards for new building construction and significant building alteration projects in order to provide a reasonable degree of safety to life and property from fire. This Standard is based on the provisions for fire safety during building construction as set forth in the California Fire Code Article 87 and National Fire Protection Association Standard #1. This Standard shall not be construed to be in lieu of other applicable State or Federal laws and regulations related to construction site safety. The general contractor (or other designee of the building owner) shall be responsible for compliance with the provisions of this Standard. When the term "shall" is used in this Standard, it means a mandatory requirement.

REQUIREMENTS

I. FIRE PROTECTION PLAN

A written Fire Protection Plan shall be developed for significant or complex construction projects at the discretion of the fire department. The plan shall be approved by the fire department prior to proceeding past foundation work for new buildings or commencement of demolition work in alteration projects. The written plan shall be consistent with the fire safety precautions as specified in this Standard. The general contractor is responsible for carrying out the provisions of the Fire Protection Plan and communicating it to all subcontractors. The Fire Protection Plan shall include the following:

- A) Procedures for reporting emergencies to the Fire department.
- B) Procedures for emergency notification, evacuation and/or relocation of all persons in the building under construction and on the site.
- C) Procedures for hot work operations, management of hazardous materials and removal of combustible debris and maintenance of emergency access roads.
- D) Floor plans identifying the locations of exits, exit stairs, exit routes and portable fire extinguishers.
- E) Site plans identifying the designated exterior assembly areas for each evacuation route.
- F) Site plans identifying required fire apparatus access roadways and on-site fire hydrants.
- G. The name and contact phone number of the person(s) responsible for compliance with the Fire Protection Plan.

II. GENERAL SAFETY REQUIREMENTS

- A) Fire Department access Roadways: All construction sites shall be accessible by fire department apparatus by means of roadways having an all-weather driving service of not less than 20ft. of unobstructed width. The roads shall have the ability to withstand the live loads of fire apparatus, and have a minimum 13ft. 6 in. of vertical clearance.

- A) *(Continued)* Dead end fire access roads in excess of 150 ft. in length shall be provided with approved turnarounds.

When approved by the Chief, temporary access roadways may be utilized until such time that the permanent roadways are installed. As a minimum, the roadway shall consist of a compacted sub base and six (6) inches of road base material (Class 2 aggregate base rock) both compacted to a minimum 95%. The perimeter edges of the roadway shall be contained and delineated by curb and gutter or other approved method. The use of geotextile reinforcing fabric underlayment or soils lime-treatment may be required if so determined by the project civil engineer. Provisions for surface drainage shall also be provided where necessary. The integrity of the roadway shall be maintained at all times.

- B) Fire hydrants: Where underground water mains and hydrants are required for the building(s) under construction, they shall be installed, completed, and in service prior to combustible construction materials accumulating on site.
- C) Telephone service: Provisions shall be provided at the construction site for emergency notification of the fire department via telephone. The street address of the construction site shall be posted adjacent to the telephone, along with the number for the public safety answering point.
- D) Premises identification: The address numbers of the property or project location shall be plainly visible and legible from the street or road fronting the property at the fire apparatus access point or as otherwise approved.
- E) Combustible debris: Wood, cardboard, packing material, form lumber and similar combustible debris shall not be accumulated within buildings. Such debris, rubbish and waste material shall be removed from buildings on a daily basis.
- F) Oily rags: Oily rags and similar material shall be stored in metal or other approved containers equipped with tight-fitting covers.
- G) Temporary heating equipment: Temporary heaters, such as those that are LPG fueled, shall be listed and shall be installed, used, and maintained in accordance with the manufacturer's instructions (See LPG storage and use requirements below). Heating devices shall be secured properly and kept clear from combustible materials. Refueling operations shall be conducted in an approved manner.
- H) Smoking: Smoking is prohibited anywhere inside or on the roof of new buildings under construction or in the project work area of buildings undergoing alteration. A suitable number of 'No Smoking' signs shall be posted to ensure that smoking is controlled.
- I) Vehicle parking: All vehicles shall be parked a minimum of 20 feet from new buildings under construction.

Exceptions: 1. Vehicles that are temporarily parked for loading/unloading or other construction related operations. Such vehicles shall not be left unattended.

Exceptions: 2. Private vehicles may be parked in parking garages of Type I construction if the automatic fire sprinkler system is in service and vertical openings are protected.

J) Combustible material storage: Combustible construction materials shall be stored a minimum of 20 feet from buildings under construction or undergoing remodel.

Exceptions: 1. Materials that are staged for installation on a floor level.
2. When approved by the Fire Department, materials may be stored in parking garages of Type I construction if the automatic fire sprinkler system is in service and vertical openings are protected.

III. FIRE PROTECTION SYSTEMS

- A) Fire Sprinkler Systems: Where automatic fire sprinkler systems are required to be installed in new buildings, the system shall be placed in service as soon possible. Immediately upon the completion of sprinkler pipe installation on each floor level, the piping shall be hydrostatically tested and inspected. After inspection approval from the Fire department, each floor level of sprinkler piping shall be connected to the system supply riser and placed into service. For system activation notification, an exterior alarm bell can be installed and connected to the sprinkler waterflow device prior to installation of the monitoring system.
- B) For buildings equipped with fire sprinkler systems that are undergoing alterations, the sprinkler system(s) shall remain in service at all times except when system modifications are necessary. Fire sprinkler systems undergoing modifications shall be returned to service at the end of each workday unless otherwise approved by the fire department. The General contractor or his/her designee shall check the sprinkler control valve(s) at the end of each workday to confirm that the system has been restored to service.
- C) Standpipes: Where standpipes are required, the standpipes shall be installed when the progress of construction is not more than 35 ft. in height above the lowest level of the fire department access. Standpipes shall be provided with fire department hose connections and outlets at accessible locations adjacent to usable stairs. The standpipe system shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring. Each floor shall be provided a 2 1/2-inch valve outlet for fire department use. Where construction height requires installation of a Class III standpipe, fire pumps and water main connections shall be provided to serve the standpipe.
- D) Fire Extinguishers: Portable fire extinguishers shall be provided and shall be mounted on a wall or post at each usable stairway and such that the travel distance to any extinguisher does not exceed 75 ft. Mounting height to the top of the extinguisher shall not exceed 5 feet. Extinguishers shall not have less than a 2A10BC rating or as otherwise directed by the fire department. The general contractor shall ensure that an adequate number of individuals are trained in the proper use of portable fire extinguishers.

- E) Fire Alarm Systems: Fire alarm systems shall be maintained operational at all times during building alterations. When an alteration requires modification to a portion of the fire alarm system, the portion of the system requiring work shall be isolated and the remainder of the system shall be kept in service whenever practical. When it is necessary to shut down an entire fire alarm system a fire watch or other mitigation approved by the fire department shall be implemented by the general contractor until the system is returned to full service.

IV. EXIT REQUIREMENTS

- A) Minimum number of Exits: All new buildings under construction shall have a least one unobstructed exit. All exits shall be identified on the Fire Protection Plan.
- B) Multi-Story Buildings: Each level above the first story in new multi-story buildings shall be provided with at least two usable exit stairs after the floor decking is installed. The stairways shall be continuous and discharge to grade level. Stairways serving more than two floor levels shall be enclosed (with openings adequately protected) after exterior walls/windows are in place. Exit stairs in new and in existing, occupied buildings shall be lighted and maintained clear of debris and construction materials at all times.
- Exception:** For new multi-story buildings, one of the required exit stairs may be obstructed on not more than two contiguous floor levels for the purposes of stairway construction (i.e., installation of gypsum board, painting, flooring, etc.).
- C) Assembly Points: Designated exterior assembly points shall be established for all construction personnel to relocate to upon evacuation. The assembly points shall also be identified in the Fire Protection Plan.

V. AREA SEPARATION WALLS

When area separation walls are required, the wall construction shall be completed (with all openings protected) immediately after the building is sufficiently weather-protected at the location of the wall(s).

VI. SPECIAL OPERATIONS REQUIREMENTS

- A) Hot Work: Hot work includes any work involving operations capable of initiating fires or explosions, including cutting, welding, brazing, soldering, grinding, thermal spraying, thawing pipe, torch applied roofing, or any other similar activity. The use of hot work equipment shall be in accordance with the following guidelines, including a pre-site inspection, fire watch and post inspection procedures.
1. Pre-site Inspection: An inspection of the hot work site shall be conducted by the General Contractor or his/her designee prior to hot work operations to ensure:
 - (a) the hot work site is clear of combustibles or that combustibles are protected;

1. Pre-site Inspection: *(Continued)*
 - (b) exposed construction is of noncombustible materials or that combustible materials are protected;
 - (c) openings are protected;
 - (d) there are no exposed combustibles on the opposite side of partitions, walls, ceilings, floors, etc.;
 - (e) fire extinguishers are available, fully charged and operable; *and*
 - (f) fire watch personnel are assigned, equipped and trained.
2. Fire Watch: The sole duty of fire watch personnel shall be to watch for the occurrence of fire during and after hot work operations. Individuals designated to fire watch duty shall have fire extinguishing equipment readily available and shall be trained in the use of such equipment. Personnel assigned to fire watch shall be responsible for extinguishing spot fires and communicating an alarm. Hot work conducted in areas with vertical and horizontal fire exposures that cannot be observed by a single individual shall have additional personnel assigned to fire watches to ensure that all exposed areas are monitored.
3. Post-inspection: The fire watch shall be maintained a minimum of 30 minutes after the conclusion of the work to look out for leftover sparks, slag or smoldering combustibles.
 - A) Asphalt and tar kettles: Asphalt kettles shall not be located within 20 feet of any combustible material, combustible building surface or building opening. With the exception of thermostatically controlled kettles, an attendant shall be within 100 feet of a kettle when the heat source is operating. Ladders or similar obstacles shall not form a part of the route between the attendance and the kettle. Kettles shall be equipped with tight-fitting covers. A minimum 20-B:C rated portable fire extinguisher shall be located within 30 feet of each asphalt kettle when the heat source is operating. Minimum 20-B:C rated portable fire extinguishers also shall be located on roofs during asphalt coating operations.
 - B) Motor Equipment: Motorized equipment including internal-combustion-powered construction equipment shall be used in accordance with the following:
 1. Equipment shall be located so that exhausts do not discharge against combustible materials.
 2. When possible, exhausts should be piped to the outside of the building.
 3. Equipment shall not be refueled while in operation.
 4. Fuel for equipment shall be stored in an approved area outside of the building.

(Ref: CFC Articles 87 & 13 – also 49, 79 and 11)

VII. HAZARDOUS MATERIALS

- A) Liquefied Petroleum Gas (LP-Gas) - Storage and use shall comply with the following:
1. Propane containers may be used in buildings under construction or undergoing major renovation as a fuel source for temporary heating for curing concrete, drying plaster and similar applications in accordance with the following:
 - (a) Heating elements (other than integral heater-container units) shall be located at least 6 feet from any LP-Gas container.
 - (b) Integral heater-container units specifically designed for the attachment of the heater to the container, or to a supporting standard attached to the container, may be used provided they are designed and installed so as to prevent direct or radiant heat application to the LP-Gas container.
 - (c) Blower and radiant type units shall not be directed toward any LP-Gas container within 20 feet.
 - (d) Heat producing equipment shall be installed with clearance to the combustibles in accordance with the manufacturer's installation instructions.
 - (e) Cylinders shall comply with DOT cylinder specifications and shall be secured in an upright position.
 - (f) Regulators shall be approved for use with LP-Gas. Fittings shall be designed for at least 250 psig service pressure.
 - (g) Hose shall be designed for a working pressure of at least 350 psig (unless limited to 5 psig) and shall be a maximum of 6 feet in length.
 - (h) Portable heaters shall be equipped with an approved automatic device to shut off the flow of gas to the main burner and to the pilot in the event of flame extinguishment or combustion failure. Portable heaters with an input of more than 50,000 Btu/hr shall be equipped with either a pilot that must be proved before the main burner can be turned on or an approved electronic ignition system.
 2. In addition to the above, for LPG storage/use in buildings undergoing alteration and that are fully or partially occupied, the following shall also apply:
 - (a) Specific approval must be obtained from the fire department prior to bringing LP-Gas containers on-site.
 - (b) The maximum water capacity of individual containers shall be 5-gallon water capacity and the number of containers in the building shall not exceed the number of workers assigned to using the LP-Gas.
 - (c) Containers having a water capacity greater than 2 1/2 lb. [1 quart] shall not be left unattended.

B) Storage, Use and Dispensing of Flammable and Combustible Liquids

1. Storage areas for flammable and combustible liquids shall be kept free of weeds and extraneous combustible material. Open flames and smoking are prohibited in flammable or combustible liquid storage areas.
2. Tanks and containers shall be marked with the name of the product and FLAMMABLE-KEEP FIRE AND FLAME AWAY. Tanks (containers in excess of 60 gallons) shall also be labeled KEEP 50 FEET FROM BUILDINGS.
3. Metal containers for Class I or II liquids shall be in accordance with DOT requirements or shall be of an approved design. Discharge devices shall not cause an internal pressure on the container. Individual containers shall not be interconnected and shall be kept closed when not in use.
4. Secondary containment or a means of spill control, drainage control, and diking is required for large containers (such as 55 gallon drums) and tanks as approved by the fire department.
5. Plans for the installation/use of any aboveground storage tank (containers greater than 60 gallons) shall be submitted to the fire department for review and permit prior to the proposed tank arriving at the site.

C. Compressed Gases:

1. Gas cylinders shall be marked with the name of the contents
2. Gas cylinders shall be stored upright and secured to prevent falling
3. When not in use, valve protective caps shall be in place
4. Gas cylinders shall be protected against physical damage
5. When stored, gas cylinders shall be separated from each other based on their hazard classes
6. Combustible materials shall be kept a minimum of 10 feet from gas containers
7. Gas cylinders shall not be placed near elevators, unprotected platform edges or other areas where they would drop more than 2 feet
8. Gas cylinders shall not be placed in areas where they may be damaged by falling objects
9. Ropes, chains or slings shall not be used to suspend gas cylinders, unless the cylinder was manufactured with appropriate lifting attachments