



Fire Prevention Bureau Guideline

400.4 Tents and Other Membrane Structures

GENERAL

These standards shall apply to any temporary membrane structure, tent, or canopy, in accordance with the California Code of Regulations (CCR) Title 19 and California Fire Code (CFC).

Temporary tents, air-supported, air inflated or tensioned membrane structures shall not be erected for a period of more than 180 days within a 12-month period on a single premises unless approved by the local Building and Fire Official.

A tent or temporary membrane structure having an area in excess of 400 square feet or canopy in excess of 700 square feet shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

The Fire Department inspections will include, but not limited to the following: Tent flame resistance, exits, portable fire extinguishers, sources of ignition, protection and security of portable LP-gas containers, generators and housekeeping. BBQ's and deep fat fryers will not be allowed in any tent, tent membrane structure, or canopy.

PERMITS

A Redwood City Fire Department Permit is required for all tents and temporary membrane structures having an area in excess of 400 square feet and canopies in excess of 700 square feet.

DEFINITIONS

For the purposes of this document, the following definitions shall apply. Multiple tents and canopies installed in concert as a single structure will be reviewed as a single structure.

Air-Inflated Structure – A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized areas used to support the structure.



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Air-Supported Structure – A structure wherein the shape of the structure is attained by air pressure, and occupants of the structure are within the elevated pressure area. Air supported structures are of two basic types:

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

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

Canopy – A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.

Temporary membrane Structure – Temporary tents, air-supported, air inflated or tensioned membrane structure as described in the California Fire Code (CFC) shall not be erected for a period of more than 180 days

Tent – A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.

ACCESS, LOCATION AND PARKING

1. Fire apparatus access shall be provided in accordance with Section 503. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet exclusive of shoulders and an unobstructed vertical clearance of not less than 13 feet 6 inches. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all weather driving capabilities.

2. Tents or membrane structures shall not be located within 20 feet of lot lines, buildings, other tents or membrane structures, parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure or tent.

Exception: Separation distance between temporary membrane structures or tents not used for cooking is not required when the aggregate floor area does not-exceed 15,000 square feet.



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3. The Fire Marshal may approve tents located in, adjacent to or on permanent buildings provided that such use does not constitute an undue hazard.

Structural Stability. Temporary membrane structures or tent and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapse. Documentation of structural stability shall be furnished to the Fire Chief on request.

Temporary air-supported and air-inflated membrane structures:

1. During high winds exceeding 50 miles per hour or in snow conditions, the use of doors in air-supported structures shall be controlled to avoid excessive air loss. Doors shall not be left open.
2. Air-supported and air-inflated structures shall have the design and construction of the fabric envelope and the method of anchoring in accordance with Architectural Fabric Structures Institute ASI77.
3. An air-supported structure used as a place of assembly shall be furnished with not less than two blowers, each of which has adequate capacity to maintain full inflation pressure with normal leakage.
4. Places of public assembly for more than 200 persons shall be furnished with either a fully automatic auxiliary engine-generator set capable of powering one blower continuously for 4 hours, or a supplementary blower powered by an internal combustion engine which shall be automatic in operation.

Seating Arrangements (Maximum Occupant Load). Occupant load requirements shall be in accordance with the provisions of Section 1004 of the CFC, and shall be determined by the Fire Marshal. Design of egress path capacity shall be based on the cumulative portion of occupant loads of all rooms, areas or spaces to that point along the path of egress travel. Once occupant load is determined, it shall be posted in a conspicuous location near each entrance and exit. Square feet per person shall be calculated at 7 square feet without tables and 15 square feet with tables.



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Exits

1. Exits shall be spaced at approximately equal intervals around the perimeter of the tent or membrane structure, and shall be located such that all points are 100 feet or less from an exit.
2. Tents, or membrane structures or a usable portion thereof shall have at least one exit and not less than the number of exits required by Table 3103.12.2.

TABLE 3103.12.2
MINIMUM NUMBER OF MEANS OF EGRESS AND MEANS OF
EGRESS WIDTHS FROM TEMPORARY MEMBRANE STRUCTURES AND TENTS

Occupant Load	Minimum Number Of Exits	Tent Minimum Exit Width	Membrane Structure Minimum Exit
10 to 199	2	72 in.	36 in.
200 to 499	3	72 in.	72 in.
500 to 999	4	96 in.	72 in.
1,000 to 1,999	5	120 in.	96 in.
2,000 to 2,999	6	120 in.	96 in.
Over 3,000 ^a	7	120 in.	96 in.

- a. When the occupant load exceeds 3,000, the total width of means of egress (in inches) shall not be less than the total occupant load multiplied by 0.2 inches per person.

Exit Openings from tents. Exit openings from tents shall remain open unless covered by a flame-resistant curtain.

1. Curtains shall be free sliding on a metal support. The support shall be a minimum of 80 inches above the floor level at the exit. Curtains shall be so arranged that, when open, no part of the curtains obstruct the exit; and
2. Curtains shall be of a color, or bear markings that contrasts with the color of the tent.

Doors. Exit doors shall swing in the direction of exit travel. To avoid hazardous pressure loss from air supported structures, such doors shall be automatic closing against operating pressures. Opening force at the door edge shall not exceed 15lbs of pressure.

Aisle. The width of aisles without fixed seating shall be in accordance with the following:

1. In areas serving employees only, the minimum aisle width shall be 24 inches but not less than the width required by the number of employees served.



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2. In public areas, smooth-surfaced, unobstructed aisles having a minimum width of not less than 44 inches shall be provided from seating areas, and aisles shall be progressively increased in width to provide, at all points, no less than 1 foot of aisle width for each 50 persons served by such aisle at that point.
3. When there are 200 seats or more all loose seats, folding chairs, or similar seating facilities that are not fixed to the floor shall be bonded together in groups of three or more. Bonding of chairs is not required when tables are provided as when the occupancy is used for dining or similar purposes.
4. Spacing of tables in occupancies having rectangular conference or banquet-type tables, such tables shall be placed not less than 54 inches apart and not less than 36 inches from walls.

Arrangement and maintenance. The arrangement of aisles shall be subject to approval by the Fire Marshal and shall be maintained clear at all times during occupancy.

Exit Signs. Exit signs shall be clearly marked. Exit signs shall be installed at required exit doorways and where otherwise necessary to indicate clearly the direction of egress when the exit serves an occupant load of 50 or more.

Exit sign Illumination. Exit signs shall be either listed and labeled in accordance with UL 924 as the internally illuminated type and used in accordance with the listing or shall be externally illuminated by luminaires supplied in the following manner:

1. Two separate circuits, one of which shall be separated from all other circuits, for occupant loads of 300 or less
2. Two separate sources of power, one of which shall be an approved emergency system, shall be provided when the occupant load exceeds 300.

Means of egress illumination. Means of egress shall be illuminated with light having an intensity of not less than 1 footcandle at floor level while the structure is occupied. Fixtures required for means of egress illumination shall be supplied from a separate circuit or source of power. The required width of exits, aisles and passageways shall be maintained at all times to a public way. Guy wires, guy ropes and other support members shall not cross a means of egress at a height of less than 8 feet. The surface of means of egress shall be maintained in a proved manner.



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Flame Resistance Standards.

1. All tent fabrics and all interior decorative fabrics or materials shall be flame resistant in accordance with appropriate standards set forth in California Code of Regulations, Title 19, Division 1, Chapter 8.
2. Tops and sidewalls shall be made either from fabric which has been flame resistant treated with an approved exterior chemical process by an approved application concern, or from inherently flame-resistant fabric approved and listed by the State Fire Marshal

Exceptions:

- (1) *Tents used for committal services at cemeteries.*
- (2) *Tents or similar fabric enclosures used within a sound stage or equivalent enclosure equipped with an overhead automatic fire extinguishing system.*

Flame propagation performance treatment. Before a permit is granted, the owner or agent shall file with the Fire Marshal a certificate executed by an approved testing laboratory certifying that the tents and membrane structures and their appurtenances: sidewalls, drops and tarpaulins; floor coverings, bunting and combustible decorative materials and effects, including sawdust when used on floors or passageways, are flame resistant.

Label. Membrane structures or tents shall have a permanently affixed label bearing the identification of size and fabric or material type. Each section of top and sidewall in large tents shall have a durable label, permanently affixed, bearing the following information:

- (1) Seal of Registration
- (2) If treated fabric, the name and registration numbers of the approved application concern and approved chemical used, and the date of treatment
- (3) If registered fabric, the trade name and registration number of the approved fabric, and the date of production.

Certification. An affidavit or affirmation shall be submitted to the Fire Marshal and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to the following information relative the flame propagation performance criteria of the fabric:

- (1) Names and addresses of the owners of the tent or air-supported structure.



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- (2) Date the fabric was last treated with flame-retardant solution.
- (3) Trade name or kind of chemical used in treatment.
- (4) Name of person of form treating the material.
- (5) Name of testing agency and test standard by which the fabric was tested.

Combustible materials. Hay, straw, shavings or similar combustible materials shall not be located within any tent or membrane structure containing an assembly occupancy. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

- (a) Sawdust, shavings, or other combustible material used on the floor or ground shall be made flame resistant or when approved by the enforcing authority shall be kept adequately damp when tent is occupied.
- (b) Hay, straw, trash and other similar flammable materials shall be stored more than 50 feet from any membrane structure or tent except upon approval of the Fire Marshal.

Smoking. Smoking shall not be permitted in tents or membrane structures. Approved "No Smoking" signs shall be posted conspicuously posted in accordance with Section 310.

Open or exposed flame. Open flame or other devices emitting flame, fire, heat or any flammable or combustible liquids, gas, charcoal or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet of the tent or membrane structures while open to the public unless approved the Fire Marshal.

Clearance. There shall be a minimum clearance of at least 3 feet between the fabric envelope and all contents located inside the membrane structure.

Portable fire extinguishers: Each temporary membrane structure or tent must have a fire extinguisher with a minimum rating of 2A:10B:C. The extinguisher must have a current State Fire Marshal's tag attached indicating that it has been serviced within one year of the date listed on the tag. Extinguishers must be placed in a location that is readily available and not blocked in any manner. Extinguishers shall be mounted at 42" above finished floor.

- (a) One Class 2-A fire extinguisher shall be provided in every tent having a floor area between 500 square feet and 1,000 square feet plus one 2-A fire extinguisher in



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each auxiliary adjacent tent. One additional extinguisher shall be provided for each additional 2,000 square feet or fraction thereof.

- (b) At least one Class 10 B-C fire extinguisher shall be provided with each generator or transformer.
- (c) At least one Class 10 B-C fire extinguisher (minimum 6L capacity Type "K") shall be provided in kitchen, dining areas, and at locations where flammable or combustible liquids or flammable gasses are used, stored, or disposed.

Heating and Cooking Equipment. Heating or cooking equipment, tanks, piping, hoses, fittings, valves, tubing and other related components shall be installed as specified in the California Mechanical Code and shall be approved by the Fire Marshal.

1. Cooking and heating equipment shall not be located within 10 feet of exits or combustible materials.
2. Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables, butane or other similar devices which do not pose an ignition hazard shall be approved.
3. Tents with sidewalls or drops where cooking is performed shall be separated for other membrane structures or tents by a minimum of 20 feet.
4. Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet of a membrane structure or tent.

LP-gas. LP-gas (Liquefied Petroleum Gas) containers shall be located outside. Safety release valves shall be pointed away from the tent or membrane structure.

1. Portable LP-gas containers with a capacity of 500 gallons or less shall have a minimum separation between the container and structure not less than 10 feet
2. Portable LP-gas containers with a capacity of more than 500 gallons shall have a minimum separation between the container and structures not less than 25 feet.
3. Portable LP-gas containers, piping, valves and fittings which are located outside and are being used to fuel equipment inside a tent or membrane structure shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an approved location. Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

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Flammable and combustible liquids. Flammable-liquid-fueled equipment shall not be used in tents or membrane structures.

1. Flammable and combustible liquids shall be stored outside in an approved manner not less than 50 feet from tents or membrane structures.
2. Refueling shall be performed in an approved location no less than 20 feet from tents or membrane structures and not in presence of public.
3. Vehicles or equipment shall not be fueled or defueled within the tent or membrane structure.

Combustible Vegetation. Combustible vegetation that could create a fire hazard shall be removed from the area occupied by a tent or membrane structure, and from areas within 30 feet of such structures.

1. The floor surface inside tents or membrane structures within a 30 foot perimeter shall be kept free of combustible waste and other combustible materials that could create a fire hazard.
2. Flammable vegetation shall be removed within 50 feet of any tent or membrane structure.
3. Such waste shall be stored in approved containers and removed from the premises at least once a day during the period the structure is occupied by the public.