

BOARD OF FORESTRY AND FIRE PROTECTION

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To: Resource Protection Committee

From: Edith Hannigan, Analyst

Date: March 23, 2016

Re: Orange County 4290 Certification Request

On September 28, 2015, the Orange County Fire Authority (OCFA) submitted the County's Ordinance 13-014 for certification by the Board of Forestry and Fire Protection in lieu of PRC 4290/14 CCR § 1270. Staff conducted a review of the submitted county code with Lori Smith, Fire Marshal, and has provided a comparison matrix indicating where each state regulation is addressed in the county code. Since submitting their Ordinance and Guidelines in late September, OCFA has begun reorganizing the way they structure their Fire Code. Rather than review this submission for certification, staff requests RPC review the content of the codes and guidelines for congruency with 14 CCR § 1270. Staff can then communicate to OCFA any content changes that need to be made prior to submitting the re-structured ordinances for certification. A Certification Matrix is attached for ease of comparison.

In the certification matrix, there is reference to:

- Orange County Fire Code (OCFC)
- California Fire Code (CFC)
- Fire Master Plans for Commercial and Residential Development Guideline B-09
- Fire Safe Development in State Responsibility Areas Guideline B-09a
- Vegetation Management Guideline C-05

The California Fire Code can be found online at

<http://codes.iccsafe.org/app/book/toc/2015/CALIFORNIA/2013%20CALIFORNIA%20FIRE%20CODE,%20SUPPLEMENT%20JULY%202015/index.html>, but the remaining documents are attached to this memo.

The Orange County Fire Authority has jurisdiction over all Orange County, including incorporated Local Responsibility Area (LRA), so Guideline B-09a specifically addresses development in the State Responsibility Area (SRA). There is a small portion of unincorporated LRA, North Tustin, approximately 6.7 square miles, with the city of Tustin to the west and south, Peters Canyon Regional Park to the east, and the city of Orange to the north. There is some VHFHSZ in the eastern part of the census-designated place, where the city borders the regional park (see attached LRA VHFHSZ map). The way the county code is written, Guideline B-09, rather than B-09a, would apply here.

**California Board of Forestry and Fire Protection
SRA Fire Safe Regulations
Certification Matrix**



Without an accompanying letter from the Board of Forestry and Fire Protection, completion of this matrix does not indicate Board certification approval or denial of submitted local ordinances under 14 CCR § 1270.03. This matrix does not reflect the full text of the regulations and should be used as a guide only.

<i>Internal Use Only</i>			
Jurisdiction	Date Received	Board Meeting Date	Board Action
Orange County	September 28, 2015	April 6, 2016	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
Sec. 1270 Title <i>Statement of the title of regulation</i>	Ordinance Number 13-014	
Sec. 1270.01 Purpose <i>Statement of the purpose of regulation</i>	Orange County Fire Code (OCFC) Section 3-3-1 Page 1	
Sec. 1270.02 Scope <i>Statement of the scope of regulation</i>	OCFC Section 3-3-1 Page 1	
Sec. 1270.03 Local Ordinances <i>Board may certify local ordinances</i>	N/A	
Sec. 1270.04 Provisions for Application of These Regulations <i>How these regulations will be applied</i>	OCFC Section 3-3-1 Page 1	
Sec. 1270.05 Inspection Authority <i>Establishing responsibility for enforcement</i>	OCFC Section 3-3-2 Page 1	
Sec. 1270.06 Inspections <i>Authorization to conduct inspections</i>	OCFC Section 3-3-2 Page 1	
Sec. 1270.07 Exceptions to Standards <i>Exceptions will be made on a case-by-case basis where the exception provides for same practical effect. Exceptions granted shall be forwarded to the CAL FIRE Unit Headquarters.</i>	California Fire Code (CFC) Chapter 1 Section 1.11.2.4	
Sec. 1270.08 Requests for Exceptions <i>Requests shall be made in writing, stating the section(s), material facts, the exception proposed, and a map.</i>	CFC Chapter 1 Section 1.11.2.4	
Sec. 1270.09 Appeals <i>Applicants may appeal exception denials. The inspection authority shall be consulted. If an appeal is granted, findings must be made and forwarded to CAL FIRE Unit HQ.</i>	CFC Chapter 1 Section 1.11.2.5	
Sec. 1271.00 Definitions <i>Definitions</i>	CFC Chapter 2 OCFC Section 3-3-4 page 3	
Sec. 1271.05 Distance Measurements <i>Distance measurements are along the ground.</i>		
Sec. 1272.00 Maintenance of Defensible Space	OCFC Section 304.1.2 pages 4-5	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p>Measures <i>Defensible space maintenance plans shall be provided.</i></p>		
<p>Sec. 1273.00 Intent <i>Unobstructed traffic circulation during a wildfire emergency and concurrent fire equipment and civilian movement.</i></p>		
<p>Sec. 1273.01 Road Width <i>Roads shall have a minimum of two 10-foot traffic lanes, not including shoulder and striping.</i></p>	<p>OCFC Section 503.2.1 page 13 – required 20 feet, excluding shoulders but does not exclude striping OCFC 503.2.1.1 page 13 requires wider width in Hazardous Fire Area (defined in Guideline B-09) Guideline B-09 page 9 Guideline B-09a page 10</p>	
<p>Sec. 1273.02 Roadway Surface <i>Designed and maintained to support the imposed load of fire apparatus weighing at least 75,000 pounds; provide an all-weather aggregate base; project proponent shall provide engineering specifications to support design if requested.</i></p>	<p>Guideline B-09 page 7 – 75,000 pound requirement only applies in the SRA Guideline B-09a page 10</p>	
<p>Sec. 1273.03 Roadway Grades <i>The grade of roads shall not exceed 16%.</i></p>	<p>Guideline B-09 page 9 Guideline B-09a page 10</p>	
<p>Sec. 1273.04 Roadway Radius <i>Horizontal inside turning radius minimum 50 feet; additional 4 foot with added to curves of 50 to 100 foot radius; additional 2 feet shall be added to curves from 100 to 200 feet. Vertical curves no less than 100 feet.</i></p>	<p>Guideline B-09 page 10; does not meet requirement but may be same practical effect. Guideline B-09a page 10</p>	
<p>Sec. 1273.05 Roadway Turnarounds <i>Required on driveways and dead-end roads. Minimum turning radius shall be 40 feet, not including parking. The top of the “T” in a hammerhead/T turnaround shall be 60 feet.</i></p>	<p>Guideline B-09 page 10 – min turning radius of 38 feet for driveways does not meet standard; Guideline B-09 page 16 – applies to “any street that is a required fire lane;” 38 feet does not meet standard (require 40 feet in the SRA); Guideline B-09 page 41 Guideline B-09a page 10</p>	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p>Sec. 1273.06 Roadway Turnouts <i>Shall be a minimum of 12 feet wide, 30 feet long, and a 25 foot taper at both ends.</i></p>	<p>No turnout dimensions but no requirements to use turnouts in code Guideline B-09a page 12</p>	
<p>Sec. 1273.07 Roadway Structures <i>Designed to carry maximum load according to CVC; must have signage posting maximum weight and height; constructed and maintained according to AASHTO HB-17; one-way bridges must have unobstructed visibility and turnouts each end.</i></p>	<p>Guideline B-09 page 10 – 68,000 pounds, 75,000 pounds for SRA. Guideline B-09a page 12 CFC Chapter 5 Section 503.2.6</p>	
<p>Sec. 1273.08 One-Way Roads <i>All one way roads will have a minimum 12 foot traffic lane, not including shoulders. All one-way roads shall connect a two lane roadway at both ends. Maximum access to no more than 10 dwelling units. Maximum length 2,640 feet. Turnout constructed at approximately mid-point.</i></p>	<p>Guideline B-09a, page 12</p>	
<p>Sec. 1273.09 Dead-End Roads <i>The length of dead-end roads is limited, based upon zoning.</i> -800 feet for parcel zoned for less than one acre. -1320 feet for parcel zoned one to five acres -2640 feet for parcel zoned five acres to 20 acres -5280 feet for parcel zoned larger than 20 acres</p>	<p>CFC Section 503.2.5 requires turnarounds on dead end roads longer than 150 feet. Guideline B-09 Section 2.A.9 page 10 limits dead end roads to 800 feet. Allows longer dead end roads in SRA in Guideline B-09a page 12</p>	
<p>Sec. 1273.10 Driveways <i>All driveways will provide a minimum 10 foot width traffic lane with a minimum width of 14 feet unobstructed horizontal clearance and vertical clearance of 15 feet. Driveways greater than 150 feet but less than 800 feet shall provide a turnout near the midpoint; turnouts every 400 feet if driveway >800 feet. A turnaround is required on all building sites with driveways over 300 feet in length, sited within 50 feet of building.</i></p>	<p>Guideline B-09 page 6 – All requirements for Fire Apparatus Access Roadways apply when “an exterior wall of the first story is located more than 150 feet from a public roadway” Guideline B-09a page 13</p>	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p>Sec. 1273.11 Gate Entrances <i>Gates shall be at least 2 feet wider than the width of the traffic lane. Minimum width of 14 feet unobstructed horizontal clearance and 15 feet vertical clearance. All gates shall be located 30 feet from the roadway shall provide unobstructed traffic access on the roadway. Security gates shall not be installed without approval. Where a one-way road provides access to a gated entrance, a 40 foot turning radius shall be used.</i></p>	<p>Guideline B-09, Section 5.A page 13 Guideline B-09a page 13</p>	
<p>Sec. 1274.00 Intent <i>Roadways and buildings are to be clearly identified.</i></p>	<p>CFC Section 505.1 and 505.2 Guideline B-09a page 13</p>	
<p>Sec. 1274.01 Size of Letters, Numbers and Symbols for Street and Road Signs <i>Size of letters and numbers on street signs to be minimum 4 inch height, 0.5 inch stroke, reflectorized and contrasting with background.</i></p>	<p>Guideline B-09a page 13</p>	
<p>Sec. 1274.02 Visibility and Legibility of Street and Road Signs <i>Street signs to visible in both directions for a minimum distance of 100 feet.</i></p>	<p>Guideline B-09a page 14</p>	
<p>Sec. 1274.03 Height of Street and Road Signs <i>Height of street signs to be uniform county wide.</i></p>	<p>Guideline B-09a page 14</p>	
<p>Sec. 1274.04 Names and Numbers on Street and Road Signs <i>Streets to be identified in a consistent countywide system. Signs to be mounted in a uniform manner.</i></p>	<p>Guideline B-09a page 14</p>	
<p>Sec. 1274.05 Intersecting Roads, Streets and Private Lanes <i>Street signs shall be at provided road intersections.</i></p>	<p>CFC Section 505.2 Guideline B-09a page 14</p>	
<p>Sec. 1274.06 Signs Identifying Traffic Access Limitations <i>Shall be placed at the intersection preceding the limitation, no more than 100 feet before the</i></p>	<p>Guideline B-09a page 14</p>	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<i>limitation</i>		
<p>Sec. 1274.07 Installation of Road, Street and Private Lane Signs <i>Street signs shall be installed prior to final acceptance by local jurisdiction for road improvements.</i></p>	<p>CFC Section 505.2 Guideline B-09a page 14</p>	
<p>Sec. 1274.08 Addresses for Buildings <i>All buildings shall be addressed according to the jurisdiction's address system. Each dwelling unit shall be separately identified.</i></p>	<p>OCFC Section 505.1 page 13-14 Guideline B-09 page 11-12 Guideline B-09a page 14</p>	
<p>Sec. 1274.09 Size of Letters, Numbers and Symbols for Addresses <i>Letter and numbers for addresses must be minimum 4 inch high, 0.5 inch stroke and contrasting background. Address shall be visible from street.</i></p>	<p>OCFC Section 505.1 page 13-14 Guideline B-09 page 11-12 Guideline B-09a page 14</p>	
<p>Sec. 1274.10 Installation, Location and Visibility of Addresses <i>All buildings must be clearly identified. Shall have a permanently posted address placed at each driveway entrance, visible from both directions of travel along road. Address shall be posted during construction and maintain thereafter. Address signs along one-way road shall be visible from both intended direction of travel and opposite direction. Multiple addresses on a single driveway shall be mounted on a single post. Addresses for single commercial business shall be placed at the nearest intersection providing access to the site.</i></p>	<p>OCFC Section 505.1 page 14 Guideline B-09 page 11-12 Guideline B-09a page 15</p>	
<p>Sec. 1275.00 Intent <i>Emergency water for wildfire protection shall be available, accessible, and maintained.</i></p>	<p>Guideline B-09a page 15</p>	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p>Sec. 1275.01 Application <i>Emergency water systems shall be installed and made serviceable prior to and during the time of construction except for alternatives approved by the authority having jurisdiction.</i></p>	<p>Guideline B-09 page 19 Guideline B-09a page 15</p>	
<p>Sec. 1275.10 General Standards <i>System must meet or exceed NFPA 1142 and California Fire Code fire flow requirements. Water may be provided in a mobile water tender or other containment structure. Nothing prohibits the combined storage of emergency wildfire and structural firefighting water supplies unless prohibited by local ordinance. Freeze protection when required.</i></p>	<p>Guideline B-09 page 19 Guideline B-09a page 15</p>	
<p>Sec. 1275.15 Hydrant/Fire Valve <i>Hydrant shall be 18 inch above ground, 8 feet from vegetation, no closer than 4 feet nor farther than 12 feet from roadway, in a location where fire apparatus will not block the roadway.</i> <i>Hydrant servicing an a building shall be not less than 50 feet nor more than ½ mile by road from building it serves and be located at a turnaround along the driveway or road that intersects the driveway.</i> <i>Headed with a 2 ½ inch National Hose male thread with cap for pressure and gravity flow systems and 4 ½ inch draft system.</i> <i>Hydrant shall have wet or dry barrel and shall have suitable crash protection required by local jurisdiction.</i></p>	<p>Guideline B-09 page 20, page 21, page 28 Guideline B-09a page 15</p>	
<p>Sec. 1275.20 Signing of Water Sources <i>If located along a driveway: marked with a 3 inch reflectorized blue marker on the driveway address sign and mounted on a fire retardant post.</i> <i>If located on a street or road: 3 inch marker shall be</i></p>	<p>Guideline B-09 page 22 Guideline B-09a page 16</p>	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p><i>mounted on a fire retardant post within 3 feet of hydrant, no less than 3 feet nor greater than 5 feet above the ground</i></p> <p><i>Or specified in the OSFM's Guidelines for Fire Hydrant Markings Along State Highways and Freeways, May 1988.</i></p>		
<p>Sec. 1276.00 Intent</p> <p><i>Reduce the intensity of wildfire through fuel modification for safe emergency operations and civilian evacuation and to establish a point of attack or defense from a wildfire.</i></p>	<p>OCFC Section 3-3-32 page 30</p> <p>Guideline C-05</p>	
<p>Sec. 1276.01 Setback for Structure Defensible Space</p> <p><i>Parceled one acre or larger provide a minimum 30 foot setback.</i></p> <p><i>Parcels less than one acre, local jurisdiction shall provide same practical effect.</i></p>	<p>Guideline B-09a page 16</p>	
<p>Sec. 1276.02 Disposal of Flammable Vegetation and Fuels</p> <p><i>Disposal of flammable vegetation and fuel modification to be done prior to final building inspection.</i></p>	<p>Guideline B-09a page 16</p>	
<p>Sec. 1276.03 Greenbelts</p> <p><i>Subdivisions and other developments, which propose greenbelts as part of their plan, shall locate the greenbelts strategically. The locations shall be approved by the local authority having jurisdiction and may be consistent with the CAL FIRE Unit Fire Management Plan or Contract County Fire Plan.</i></p>	<p>CFC Chapter 49</p> <p>Guideline C-05</p> <p>Guideline B-09a page 16</p>	

ORDINANCE NO. 13-014

AN ORDINANCE OF THE COUNTY OF ORANGE, CALIFORNIA REPEALING THE CALIFORNIA FIRE CODE, 2010 EDITION ORDINANCE 11-005 AND ADOPTING BY REFERENCE THE CALIFORNIA FIRE CODE, 2013 EDITION WITH APPENDIX B, BB, C, CC AND AMENDMENTS THERETO.

FIRE CODE

Section 3-3-1. Fire Code Adopted

The 2013 California Fire Code, based on the International Fire Code, 2012 Edition, with errata, published by International Code Council (ICC), and the whole thereof, including Appendix B, Appendix BB, Appendix C, Appendix CC, are hereby adopted by the County of Orange for the purpose of prescribing regulations governing conditions hazardous to the life and property from fire and explosion, save and except such portions as are hereinafter added, deleted, modified or amendment. One copy of all the above is now on file in the office of the Clerk for public inspection and is adopted with the same force and effect as through set out herein in full.

Section 3-3-2 Enforcement and Inspection

The California Fire Code with amendments shall be enforced by the Orange County Fire Authority, which shall be operated under the Fire Chief of the Orange County Fire Authority. The Fire Chief of the Orange County Fire Authority may detail such members of the fire authority as inspectors as shall be necessary from time to time.

Section 3-3-3. Chapter 1

Chapter 1 Scope and Administration is adopted in its entirety with the following amendments:

Section 109.4 Violation penalties is hereby revised as follows: Infraction, Misdemeanor, as follows:

1 **109.4 Violation penalties.** Persons who shall violate a provision of this code or shall
2 fail to comply with any of the requirements thereof or who shall erect, install, alter,
3 repair or do work in violation of the approved construction documents or directive of the
4 fire code official, or of a permit or certificate used under provisions of this code, shall be
5 guilty of either a misdemeanor, infraction or both as prescribed in Section 109.4.2 and
6 109.4.3. Penalties shall be as prescribed in local ordinance. Each day that a violation
7 continues after due notice has been served shall be deemed a separate offense.

8 **Sections 109.4.2 Infraction** is hereby added as follows:

9 **109.4.2 Infraction.** Except as provided in Section 109.4.3, persons operating or
10 maintaining any occupancy, premises or vehicle subject to this code that shall permit any
11 fire or life safety hazard to exist on premises under their control shall be guilty of an
12 infraction.

13 **Sections 109.4.3 Misdemeanor** is hereby added as follows:

14 **109.4.3 Misdemeanor.** Persons who fail to take immediate action to abate a fire or life
15 safety hazard when ordered or notified to do so by the chief or a duly authorized
16 representative, or who violate the following sections of this code, shall be guilty of a
17 misdemeanor:

18 104.11.2 Obstructing operations

19 104.11.3 Systems and Devices

20 107.5 Overcrowding

21 109.3.2 Compliance with Orders and Notices

22 111.4 Failure to comply

23 305.4 Deliberate or negligent burning

24 308.1.2 Throwing or placing sources of ignition

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310.7 Burning Objects

3104.7 Open or exposed flames

Section 3-3-4. Chapter 2

Chapter 2 Definitions is adopted in its entirety with the following amendments:

Sections 202 General Definitions is hereby revised by adding "Approach-Departure Path," "Emergency Helicopter Landing Facility (EHLF)," "Flow-line," "Hazardous Fire Area," "Safety Area," and "Takeoff and Landing Area" and revising "High-Rise Building" as follows:

202 General Definitions

APPROACH-DEPARTURE PATH. The flight path of the helicopter as it approaches or departs from the landing pad.

EMERGENCY HELICOPTER LANDING FACILITY (EHLF). A landing area on the roof of a high rise building that is not intended to function as a heliport or helistop but is capable of accommodating fire, police, or medical helicopters engaged in emergency operations.

FLOW-LINE. The lowest continuous elevation on a curb defined by the path traced by a particle in a moving body of water at the bottom of the rolled curb.

HAZARDOUS FIRE AREA. Includes all areas identified within Section 4906.2 and other areas as determined by the Fire Code Official as presenting a fire hazard due to the presence of combustible vegetation, or the proximity of the property to an area that contains combustible vegetation.

HIGH-RISE BUILDING. In other than Group I-2 occupancies, "high-rise buildings" as used in this Code:

1 **Existing high-rise structure.** A high-rise structure, the construction of which is
2 commenced or completed prior to July 1, 1974.

3 **High-rise structure.** Every building of any type of construction or occupancy
4 having floors used for human occupancy located more than 75 55 feet above the
5 lowest floor level having building access (~~see Section 403~~), except buildings used as
6 hospitals as defined in Health and Safety Code Section 1250.

7 **New high-rise building.** A high-rise structure, the construction of which is
8 commenced on or after July 1, 1974. For the purpose of this section, construction
9 shall be deemed to have commenced when plans and specifications are more than
10 50 percent complete and have been presented to the local jurisdiction prior to July 1,
11 1974. Unless all provisions of this section have been met, the construction of such
12 buildings shall commence on or before January 1, 1976.

13 **New high-rise structure.** means a high-rise structure, the construction of which
14 commenced on or after July 1, 1974.

15 **SAFETY AREA.** A defined area surrounding the landing pad that is free of obstructions.

16 **SKY LANTERN.** An airborne lantern typically made of paper, Mylar, or other
17 lightweight material with a wood, plastic, or metal frame containing a candle, fuel cell,
18 or other heat source that provides buoyancy.

19 **TAKEOFF AND LANDING AREA.** The combination of the landing pad centered within
20 the surrounding safety area.

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22 **Section 3-3-5. Chapter 3**

23 **Chapter 3 General Requirements** is adopted in its entirety with the following amendments:

24 **Section 304.1.2 Vegetation** is hereby revised as follows:
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1 **304.1.2 Vegetation.** Weeds, grass, vines or other growth that is capable of being
2 ignited and endangering property, shall be cut down and removed by the owner or
3 occupant of the premises. Vegetation clearance requirement in urban-wildland interface
4 areas shall be in accordance with Chapter 49 and OCFA vegetation management
5 guidelines.

6 **Section 305.5 Chimney spark arresters** is hereby added as follows:

7 **305.5 Chimney spark arresters.** All chimneys attached to any appliance or fireplace
8 that burns solid fuel shall be equipped with an approved spark arrester. Chimneys
9 serving outdoor appliances or fireplaces shall be equipped with a spark arrester. The
10 spark arrester shall meet the requirements of Section 2113.9.2 of the California Building
11 Code.

12 **Section 305.6 Outdoor fires** is hereby added as follows:

13 **305.6 Outdoor fires.** Outdoor fires shall be in accordance with Sections 305, 307, and
14 308 and with other applicable sections of this code.

15 **305.6.1 Where prohibited.** Outdoor fires shall not be built, ignited or maintained
16 in fuel modification areas, Wildfire Risk Areas (WRA) and adopted Fire Hazard
17 Severity Zones (FHSZ) or Special Fire Protection Areas (SFPA) or other locations
18 where conditions could cause the spread of fire to the WRA, SFPA or FHSZ, except
19 by permit from the fire code official.

20 **Exceptions:** A permit is not required for the following:

- 21 **1.** Fires in approved outdoor or portable fireplaces, fire pits, fire rings and
22 similar devices at Group R occupancies that are installed and used in
23 accordance with this code.
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1 2. Outdoor fires at inhabited premises or official organized campsites or
2 parks when located in a permanent or portable barbeque or grill,
3 incinerator, or outdoor fireplace located at least 30 feet from combustible
4 vegetation.

5 3. Installations or uses approved by the fire code official.

6 **305.6.1.1 Fuel Modification Areas.** Outdoor fires using wood or other solid
7 fuel shall not be built, ignited or maintained in a fuel modification area.

8 **305.6.1.2 Supervision.** Where a permit is issued or when allowed under the
9 exceptions to Section 305.6.1, such fires shall be supervised by a person 18
10 years of age or older.

11 **305.6.2 Hazardous conditions.** Outdoor fires are not allowed when predicted
12 sustained winds exceed 8 MPH during periods when relative humidity is less than
13 25%, or a red flag condition has been declared or public announcement is made,
14 when an official sign was caused to be posted by the fire code official, or when such
15 fires present a hazard as determined by the fire code official.

16 **305.6.3 Disposal of rubbish.** Rubbish, trash or combustible waste material shall
17 be burned only within an approved incinerator and in accordance with Section
18 307.2.1.

19 **Section 307 OPEN BURNING, RECREATIONAL FIRES AND PORTABLE OUTDOOR**
20 **FIREPLACES** is hereby amended as follows:

21
22 **SECTION 307 OPEN BURNING, RECREATIONAL FIRES, FIRE PITS, FIRE RINGS, AND**
23 **OUTDOOR FIREPLACES**
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1 **307.6 Outdoor Fireplaces, Fire Pits, Fire Rings, or similar devices used at**
2 **Group R Occupancies.** Outdoor fireplaces, fire pits, fire rings, or similar exterior
3 devices used at Group R shall comply with this section.

4 **Exception:** Barbeques, grills, and other portable devices intended for cooking.

5 **307.6.1 Gas-fueled devices.** Outdoor fireplaces, fire pits and similar devices
6 fueled by natural gas or liquefied-petroleum gas are allowed when approved by
7 the Building Department and the device is designed to only burn a gas flame and
8 not wood or other solid fuel. At R-3 occupancies, combustible construction shall
9 not be located within three feet of an atmospheric column that extends vertically
10 from the perimeter of the device. At other R occupancies, the minimum distance
11 shall be ten feet. Where a permanent Building Department approved hood and
12 vent is installed, combustible construction may encroach upon this column
13 between the bottom of the hood and the vent opening. Where chimneys or
14 vents are installed, they shall have a spark arrester in accordance with Section
15 305.5.

16 **307.6.2 Devices using wood or fuels other than natural gas or**
17 **liquefied-petroleum gas.** Fireplaces burning wood or other solid fuel shall be
18 constructed in accordance with the California Building Code and Section 305.5.
19 Fires in a fireplace shall be contained within a firebox with an attached chimney.
20 The opening in the face of the firebox shall have an installed and maintained
21 method of arresting sparks. The burning of wood or other solid fuel in a device is
22 not allowed within 15 feet of combustible structures, unless within a permanent
23 or portable fireplace. Conditions which could cause a fire to spread within 25
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1 feet of a structure or to vegetation shall be eliminated prior to ignition. Fires in
2 devices burning wood or solid fuel shall be managed per Section 307.5.

3 **307.6.2.1 Where prohibited.** The burning of wood and other solid fuels
4 shall not be conducted within a fuel modification zone. Wood and other solid
5 fuel burning fires in devices other than permanent fireplaces are not allowed
6 within Wildfire Risk Areas (WRA) and adopted Fire Hazard Severity Zones
7 (FHSZ) and Special Fire Protection Areas (SPPA) or in locations where
8 conditions could cause the spread of fire to the WRA or FHSZ, unless
9 determined by the Fire Code Official that the location or design of the device
10 should reasonably prevent the start of a wildfire.

11 **Section 319 Development on or Near Land Containing or Emitting Toxic,**
12 **Combustible or Flammable Liquids, Gases or Vapors,** is hereby added as follows:

13 **319 Development On Or Near Land Containing Or Emitting Toxic,**
14 **Combustible or Flammable Liquids, Gases or Vapors.** The fire code official may
15 require the submittal for approval of geological studies, evaluations, reports, remedial
16 recommendations and/or similar documentation from a state-licensed and department-
17 approved individual or firm, on any parcel of land to be developed which has, or is
18 adjacent to, or within 1,000 feet (304.8 m) of a parcel of land that has an active,
19 inactive, or abandoned oil or gas well operation, petroleum or chemical refining facility,
20 petroleum or chemical storage, or may contain or give off toxic, combustible or
21 flammable liquids, gases or vapors.

22 **Section 320 Fuel Modification Requirements for New Construction** is hereby added as
23 follows:
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1 **320 Fuel Modification Requirements for New Construction.** All new buildings to
2 be built or installed in areas with or adjacent to land having hazardous combustible
3 vegetation shall comply with the requirements in the edition of OCFA Vegetation
4 Management Guidelines currently in use at the time of plan submittal.

5
6 **Section 321 Clearance of brush or vegetation growth from roadways** is hereby added as
7 follows:

8 **321 Clearance of brush or vegetation growth from roadways.** The fire code official
9 is authorized to cause areas within 10 feet (3048 mm) on each side of portions of
10 highways and private streets which are improved, designed or ordinarily used for vehicular
11 traffic, to be cleared of flammable vegetation and other combustible growth.

12 Measurement shall be from the flow-line or the end of the improved edge of the roadway
13 surfaces.

14 **Exception:** Single specimens of trees, ornamental shrubbery or cultivated ground cover
15 such as green grass, ivy, succulents or similar plants used as ground covers, provided that
16 they do not form a means of readily transmitting fire.

17 **Section 322 Unusual Circumstances** is hereby added as follows:

18 **322 Unusual circumstances.** The fire code official may suspend enforcement of the
19 vegetation management requirements and require reasonable alternative measures
20 designed to advance the purpose of this code if determined that In any specific case that
21 any of the following conditions exist:

- 22 1. Difficult terrain.
23 2. Danger of erosion.
24

- 1 3. Presence of plants included in any state and federal resources agencies,
2 California Native Plant Society and county-approved list of wildlife, plants, rare,
3 endangered and/or threatened species.
- 4 4. Stands or groves of trees or heritage trees.
- 5 5. Other unusual circumstances that make strict compliance with the clearance of
6 vegetation provisions undesirable or impractical.

7 **Section 323 Use of Equipment** is hereby added as follows:

8 **323 Use of equipment.** Except as otherwise provided in this section, no person shall
9 use, operate, or cause to be operated in, upon or adjoining any hazardous fire area any
10 internal combustion engine which uses hydrocarbon fuels, unless the engine is equipped
11 with a spark arrester as defined in Section 323.1 maintained in effective working order, or
12 the engine is constructed, equipped and maintained for the prevention of fire.

13 **Exceptions:**

- 14 1. Engines used to provide motor power for trucks, truck tractors, buses, and
15 passenger vehicles, except motorcycles, are not subject to this section if the
16 exhaust system is equipped with a muffler as defined in the Vehicle Code of
17 the State of California.
- 18 2. Turbocharged engines are not subject to this section if all exhausted gases
19 pass through the rotating turbine wheel, there is no exhaust bypass to the
20 atmosphere, and the turbocharger is in good mechanical condition

21 **Section 323.1 Spark Arresters** is hereby added as follows:

22 **323.1 Spark arresters.** Spark arresters shall comply with the following:

- 23 1. A spark arrester is a device constructed of nonflammable material specifically for the
24 purpose of removing and retaining carbon and other flammable particles over 0.0232
25

1 of an inch (0.58 mm) in size from the exhaust flow of an internal combustion engine
2 that uses hydrocarbon fuels or which is qualified and rated by the United States
3 Forest Service.

- 4 2. Spark arresters affixed to the exhaust system of engines or vehicles subject to
5 Section 322 shall not be placed or mounted in such a manner as to allow flames or
6 heat from the exhaust system to ignite any flammable material.

7 **Section 324 Restricted Entry** is hereby added as follows:

8 **324 Restricted entry.** The fire code official shall determine and publicly announce when
9 hazardous fire areas shall be closed to entry and when such areas shall again be opened
10 to entry. Entry on and occupation of hazardous fire areas, except public roadways,
11 inhabited areas or established trails and camp sites which have not been closed during
12 such time when the hazardous fire area is closed to entry, is prohibited.

13 **Exceptions:**

- 14 1. Residents and owners of private property within hazardous fire areas and their
15 invitees and guests going to or being upon their lands.
16
17 2. Entry, in the course of duty, by peace or police officers, and other duly
18 authorized public officers, members of a fire department and members of the
19 United States Forest Service.

20 **Section 325 Trespassing on posted property** is hereby added as follows:

21 **325 Trespassing on posted property.** When the fire code official determines that a
22 specific area within a hazardous fire area presents an exceptional and continuing fire
23 danger because of the density of natural growth, difficulty of terrain, proximity to
24 structures or accessibility to the public, such areas shall be closed until changed conditions
25 warrant termination of closure. Such areas shall be posted as hereinafter provided.

1 1. Signs. Approved signs prohibiting entry by unauthorized persons and referring
2 to applicable fire code chapters shall be placed on every closed area.

3 2. Trespassing. Entering and remaining within areas closed and posted is
4 prohibited.

5 **Exception:** Owners and occupiers of private or public property within closed and
6 posted areas, their guests or invitees, and local, state and federal public officers and
7 their authorized agents acting in the course of duty.

8 **Section 326 Sky Lanterns or similar devices** is hereby added as follows:

9
10 **326 Sky Lanterns or similar devices.** The ignition and/or launching of a Sky Lantern
11 or similar device is prohibited.

12 **Exception:** Upon approval of the fire code official, sky lanterns may be used as
13 necessary for religious or cultural ceremonies providing that adequate safeguards
14 have been taken as approved by the fire code official. Sky Lanterns must be
15 tethered in a safe manner to prevent them from leaving the area and must be
16 constantly attended until extinguished.

17
18 **Section 3-3-6. Chapter 4**

19 **Chapter 4: Emergency Planning and Preparedness** Adopt only the Sections listed below:

- 20 1. 401
21 2. 401.3.4
22 3. 401.9
23 4. 402
24 5. 403
25

- 1 **6. 404.6 – 404.7.6**
- 2 **7. 407**
- 3 **8. 408.3.1 – 408.3.2**
- 4 **9. 408.12 – 408.12.3**

5

6 **Section 3-3-7. Chapter 5**

7 **Chapter 5 Fire Service Features** is adopted in its entirety with the following amendments:

8 **SECTION 503.2.1 Dimensions** is revised as follows:

9 **503.2.1 Dimensions.** Fire apparatus access roads shall have an unobstructed width of
10 not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security
11 gates in accordance with Section 503.6, and an unobstructed vertical clearance of not
12 less than 13 feet 6 Inches (4115 mm). Street widths are to be measured from top face
13 of curb to top face of curb, on streets with curb and gutter, and from flow-line to flow-
14 line on streets with rolled curbs.

15 **SECTION 503.2.1.1 Hazardous Fire Area** is added as follows:

16 **503.2.1.1 Hazardous Fire Areas.** In Hazardous Fire Areas the minimum fire
17 apparatus road width shall be 28 feet (8530 mm). The width shall be maintained to an
18 approved point outside of the Hazardous Fire Area.

19 **Exception:** When the road serves no more than three dwelling units and the road
20 does not exceed 150 feet in length, the road width may be 24 feet (7300 mm). This
21 length may be increased to 400 feet where serving no more than three dwelling
22 units and all structures accessed from the roadway are protected by automatic fire
23 sprinklers.
24

25 **Section 505.1 Address Identification** is revised as follows:

1 **505.1 Address identification.** New and existing buildings shall have approved
2 address numbers, building numbers or approved building identification placed in a
3 position that is plainly legible and visible from the street or road fronting the property.
4 These numbers shall contrast with their background. Where required by the fire code
5 official, address numbers shall be provided in additional approved locations to facilitate
6 emergency response. Address numbers shall be Arabic numbers or alphabetical letters.
7 Numbers shall be a minimum of 4 inches (101.6 mm) high with a minimum stroke width
8 of 0.5 inch (12.7 mm) for R-3 occupancies, for all other occupancies the numbers shall
9 be a minimum of 6 inches high with a minimum stroke width of 1 inch. Where access is
10 by means of a private road and the building cannot be viewed from the public way, a
11 monument, pole or other sign or means shall be used to identify the structure. Address
12 numbers shall be maintained.

13 **Section 510.1 Emergency responder radio coverage** is revised as follows:

14 **510.1 Emergency responder radio coverage in new buildings.** All new buildings
15 shall have approved radio coverage for emergency responders within the building based
16 upon the existing coverage levels of the public safety communication systems of the
17 jurisdiction at the exterior of the building. This section shall not require improvement of
18 the existing public safety communication systems. The Emergency responder radio
19 coverage system shall comply with one of the following:

- 20 1. An emergency radio system installed in accordance with the local authority
21 having jurisdiction's ordinance.
- 22 2. An emergency radio coverage system installed in accordance with Orange
23 County Fire Authority's Emergency Responder Digital Radio Guideline.

24 **Exceptions:**
25

- 1 1. Where it is determined by the fire code official that the radio coverage
2 system is not needed.
- 3 2. In facilities where emergency responder radio coverage is required and such
4 systems, components or equipment could have a negative impact on normal
5 operations of the facility, the fire code official shall have the authority to
6 accept an automatically activated emergency responder radio coverage
7 system.

8 **Sections 510.2; 510.3; 510.4; 510.5; 510.6** are hereby deleted without replacement:

9
10 **Section 3-3-8. Chapter 6**

11 **Chapter 6 Building Services and Systems** is adopted in its entirety with the following
12 amendments:

13 **Section 608.1 Scope** is hereby amended as follows:

14 **608.1 Scope.** Stationary storage battery systems having an electrolyte capacity of
15 more than 50 gallons (189 L) for flooded lead acid, nickel cadmium (Ni-Cd) and valve-
16 regulated lead acid (VRLA), or 1,000 pounds (454 kg) for lithium-ion and lithium metal
17 polymer, used for facility standby power, emergency power or uninterruptible power
18 supplies shall comply with this section and Table 608.1. Indoor charging systems for
19 electric carts/cars with more than 50 gallons (189 L) aggregate quantity shall comply
20 with Section 608.10.

21 **Section 608.10 Indoor charging of electric carts/cars** is hereby added as follows:

22 **608.10 Indoor charging of electric carts/cars.** Indoor charging of electric
23 carts/cars where the combined volume of all battery electrolyte exceeds 50 gallons shall
24 comply with following:
25

- 1 1. Spill control and neutralization shall be provided and comply with Section 608.5.
- 2 2. Room ventilation shall be provided and comply with Section 608.6.1
- 3 3. Signage shall be provided and comply with Section 608.7.1
- 4 4. Smoke detection shall be provided and comply with Section 907.2

5
6 **Section 3-3-9. Chapter 7**

7 **Chapter 7 Fire-Resistance-Rated Construction** is adopted in its entirety without
8 amendments.

9
10 **Section 3-3-10. Chapter 8**

11 **Chapter 8 Interior Finish, Decorative Materials and Furnishings** is adopted in its
12 entirety without amendments.

13 **Section 3-3-11. Chapter 9**

14 **Adopt Chapter 9 Fire Protection Systems** is adopted in its entirety with the following
15 amendments:

16 **Section 903.2 Where required** is hereby revised as follows:

17 **903.2 Where required.** Approved automatic sprinkler systems in buildings and
18 structures shall be provided when one of the following conditions exists:

- 19
20 1. **New buildings:** Notwithstanding any applicable provisions of Sections 903.2.1
21 through 903.2.19, an automatic fire-extinguishing system shall also be installed
22 in all occupancies when the total building area exceeds 5,000 square feet (465
23 m²) as defined in Section 202, regardless of fire areas or allowable area, or is
24 more than two stories in height.

1 **2. Existing Buildings:** Notwithstanding any applicable provisions of this code, an
2 automatic sprinkler system shall be provided in an existing building when an
3 addition occurs and one of the following conditions exists:

- 4 a. When an addition is 33% or more of the existing building area, and the
5 resulting building area exceeds 5000 square feet (465 m²) as defined in
6 Section 202; or
7 b. When an addition exceeds 2000 square feet (186 m²) and the resulting
8 building area exceeds 5000 square feet (465 m²) as defined in Section 202;
9 or
10 c. An additional story is added above the second floor regardless of fire areas or
11 allowable area.

12 **Exception:** Group R-3 occupancies shall comply with Section 903.2.8.

13 **Section 903.2.8 Group R** is hereby revised as follows:

14 **903.2.8 Group R.** An automatic sprinkler system installed in accordance with Section
15 903.3 shall be provided throughout all buildings with a Group R fire area as follows:

- 16 1. **New Buildings:** An automatic sprinkler system shall be installed
17 throughout all new buildings.
18 2. **Existing Buildings:** All existing buildings shall be equipped with
19 automatic fire sprinkler systems when alteration or addition meets the
20 following conditions:
21 a. **Alteration:** When the area of the existing structure is greater than 5,500
22 square feet and the area of alteration within any two-year period
23 exceeds 50% of area of the existing structure.
24

25 **Exception** When the cost of installing an approved automatic sprinkler

1 system exceeds 5% of the cost of the alteration, with the approval of the
2 Fire Code Official, the required automatic sprinkler system may be
3 omitted. The sprinkler system cost shall be calculated at \$1.65 per
4 square foot.

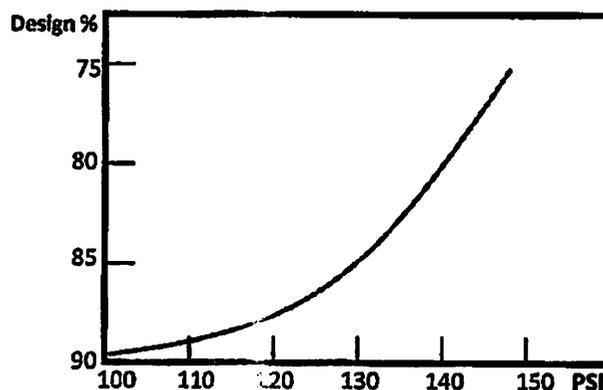
- 5 b. Addition: The addition and existing building shall be equipped with
6 automatic fire sprinkler system when the total square footage of the
7 addition is greater than 550 square feet and the structure with the
8 addition is 5,500 square feet or greater

9 **Section 903.3.5.3 Hydraulically calculated systems** is hereby added as follows:

10 **903.3.5.3 Hydraulically calculated systems.** The design of hydraulically calculated
11 fire sprinkler systems shall not exceed 90% of the water supply capacity.

12 **Exception:** When static pressure exceeds 100 psi, and required by the Fire Code
13 Official, the fire sprinkler system shall not exceed water supply capacity specified by
14 Table 903.3.5.3

15 **TABLE 903.3.5.3**
16 **Hydraulically Calculated Systems**



23 **Section 903.4 Sprinkler system supervision and alarms** is hereby revised by deleting
24 item 3 and 5, and renumbering the Exceptions as follows:

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

2. Limited area systems serving fewer than 20 sprinklers.
3. Jockey pump control valves that are sealed or locked in the open position.
4. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
5. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

Section 905.4 Location of Class I standpipe hose connections is hereby amended by adding item 7 as follows:

7. The centerline of the 2.5 inch (63.5 mm) outlet shall be no less than 18 inches (457.2 mm) and no more than 24 inches above the finished floor.

Section 907.2.13 High-rise buildings is hereby revised as follows:

907.2.13 High-rise buildings and Group I-2 occupancies having occupied floors located more than 55 feet above the lowest level of fire department vehicle access. High-rise buildings and Group I-2 occupancies having occupied floors located more than 55 feet above the lowest level of fire department vehicle access shall be provided with an automatic smoke detection system in accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.6.2.2.

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 406.5 of the California Building Code.

1 3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1
2 of the California Building Code.

3 4. Low-hazard special occupancies in accordance with Section 503.1.1 of the
4 California Building Code.

5 5. In Group I-2 and R-2.1 occupancies, the alarm shall sound at a constantly
6 attended location and occupant notification shall be broadcast by the
7 emergency voice/alarm communication system

8 **Section 907.3.1 Duct smoke detectors** is hereby amended as follows:

9 **907.3.1 Duct smoke detectors.** Smoke detectors installed in ducts shall be listed for
10 the air velocity, temperature and humidity present in the duct. Duct smoke detectors
11 shall be connected to the building's fire alarm control unit when a fire alarm system is
12 installed. Activation of a duct smoke detector shall initiate a visible and audible
13 supervisory signal at a constantly attended location and shall perform the intended fire
14 safety function in accordance with this code and the California Mechanical Code. Duct
15 smoke detectors shall not be used as a substitute for required open area detection.

16 **Exception:** In occupancies not required to be equipped with a fire alarm system,
17 actuation of a smoke detector shall activate a visible and an audible signal in an
18 approved location. Smoke detector trouble conditions shall activate a visible or
19 audible signal in an approved location and shall be identified as air duct detector
20 trouble.

21 **Section 907.5.2.2 Emergency voice/alarm communication systems** is revised as
22 follows.

23 **907.5.2.2 Emergency voice/alarm communication systems.** Emergency
24 voice/alarm communication systems required by this code shall be designed and
25

1 installed in accordance with NFPA 72. The operation of any automatic fire detector,
2 sprinkler waterflow device or manual fire alarm box shall automatically sound an alert
3 tone followed by voice instructions giving approved information and directions for a
4 general or staged evacuation in accordance with the building's fire safety and evacuation
5 plans required by Section 404. In high-rise buildings and Group I-2 occupancies having
6 occupied floors located more than 55 feet above the lowest level of fire department
7 vehicle access, the system shall operate on a minimum of the alarming floor, the floor
8 above and the floor below. Speakers shall be provided throughout the building by
9 paging zones. At a minimum, paging zones shall be provided as follows:

- 10 1. Elevator groups.
- 11 2. Exit stairways.
- 12 3. Each floor.
- 13 4. Areas of refuge as defined in Chapter 2.
- 14 5. Dwelling units in apartment houses.
- 15 6. Hotel guest rooms or suites.

16 **Exception:** In Group I-2 and R-2.1 occupancies, the alarm shall sound in a
17 constantly attended area and a general occupant notification shall be broadcast over
18 the overhead page.

19 **Section 907.6.3.2 High-rise buildings** is revised as follows.

20 **907.6.3.2 High-rise buildings.** High-rise buildings and Group I-2 occupancies having
21 occupied floors located more than 55 feet above the lowest level of fire department
22 vehicle access, a separate zone by floor shall be provided for all of the following types of
23 alarm-initiating devices where provided:

- 24 1. Smoke detectors.
- 25

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

Section 907.6.5 Monitoring is revised as follows

907.6.5 Monitoring. Fire alarm systems required by this chapter or by the California Building Code shall be monitored by an approved supervising station in accordance with NFPA 72, this section, and per Orange County Fire Authority Guideline "New and Existing Fire Alarm & Signaling Systems."

Section 3-3-12. Chapter 10

Chapter 10 Means of Egress is adopted in its entirety without amendments

Section 3-3-13. Chapter 11

Chapter 11 Construction Requirements for Existing Buildings. Adopt only those

Sections and Subsections listed below:

1103.7

1103.7.3

1103.7.3.1

1103.7.8 – 1103.7.8.2

1103.7.9 – 1103.7.9.10

1103.8 – 1103.8.5.3

1106

Section 3-3-14. Chapter 20

Chapter 20 Aviation Facilities is adopted in its entirety with the following amendments:

1 **Section 2008 Emergency Helicopter Landing Facility (EHLF) and its subsections are**
2 hereby added as follows.

3 **SECTION 2008**

4 **Emergency Helicopter Landing Facility (EHLF)**

5 **2008.1 General.** Every building of any type of construction or occupancy having floors
6 used for human occupancy located more than 75 ft above the lowest level of fire
7 department vehicle access shall have a rooftop emergency helicopter landing facility
8 (EHLF) in a location approved by the fire code official for use by fire, police, and
9 emergency medical helicopters only.

10 **2008.1.1 Rooftop Landing Pad.** The landing pad shall be 50 ft. x 50 ft. or a 50 ft.
11 diameter circle that is pitched or sloped to provide drainage away from access points
12 and passenger holding areas at a slope of 0.5 percent to 2 percent. The landing pad
13 surface shall be constructed of approved non-combustible, nonporous materials. It shall
14 be capable of supporting a helicopter with a maximum gross weight of 15,000 lbs. For
15 structural design requirements, see California Building Code.

16 **2008.1.2 Approach-Departure Path.** The emergency helicopter landing
17 facility shall have two approach-departure paths separated from each other by at least
18 90 degrees. No objects shall penetrate above the approach-departure paths. The
19 approach-departure path begins at the edge of the landing pad, with the same width or
20 diameter as the landing pad and rises outward and upward at a ratio of eight feet
21 horizontal distance for every one foot of vertical height.

22 **2008.1.3 Safety Area.** The safety area is a horizontal plane level with the landing pad
23 surface and shall extend 25 ft in all directions from the edge of the landing pad. No
24 objects shall penetrate above the plane of the safety area.
25

1 **2008.1.4 Safety Net.** If the rooftop landing pad is elevated more than 30 in. (2'-6")
2 above the adjoining surfaces, a 6 ft in wide horizontal safety net capable of supporting
3 25 lbs/sf shall be provided around the perimeter of the landing pad. The inner edge of
4 the safety net attached to the landing pad shall be slightly dropped (greater than 5 in.
5 but less than 18 in.) below the pad elevation. The safety net shall slope upward but the
6 outer safety net edge shall not be above the elevation of the landing pad.

7 **2008.1.5 Take-off and Landing Area.** The takeoff and landing area shall be free of
8 obstructions and 100 ft x 100 ft. or 100 ft. diameter.

9 **2008.1.6 Wind Indicating Device.** An approved wind indicating device shall be
10 provided but shall not extend into the safety area or the approach-departure paths.

11 **2008.1.7 Special Markings.** The emergency helicopter landing facility shall be marked
12 as indicated in Figure 2008.1.7.

13 **2008.1.8 EHLF Exits.** Two stairway exits shall be provided from the landing platform
14 area to the roof surface. For landing areas less than 2,501 square feet in area, the
15 second exit may be a fire escape or ladder leading to the roof surface below. The
16 stairway from the landing facility platform to the floor below shall comply with Section
17 1009.7.2 for riser height and tread depth. Handrails shall be provided, but shall not extend
18 above the platform surface.

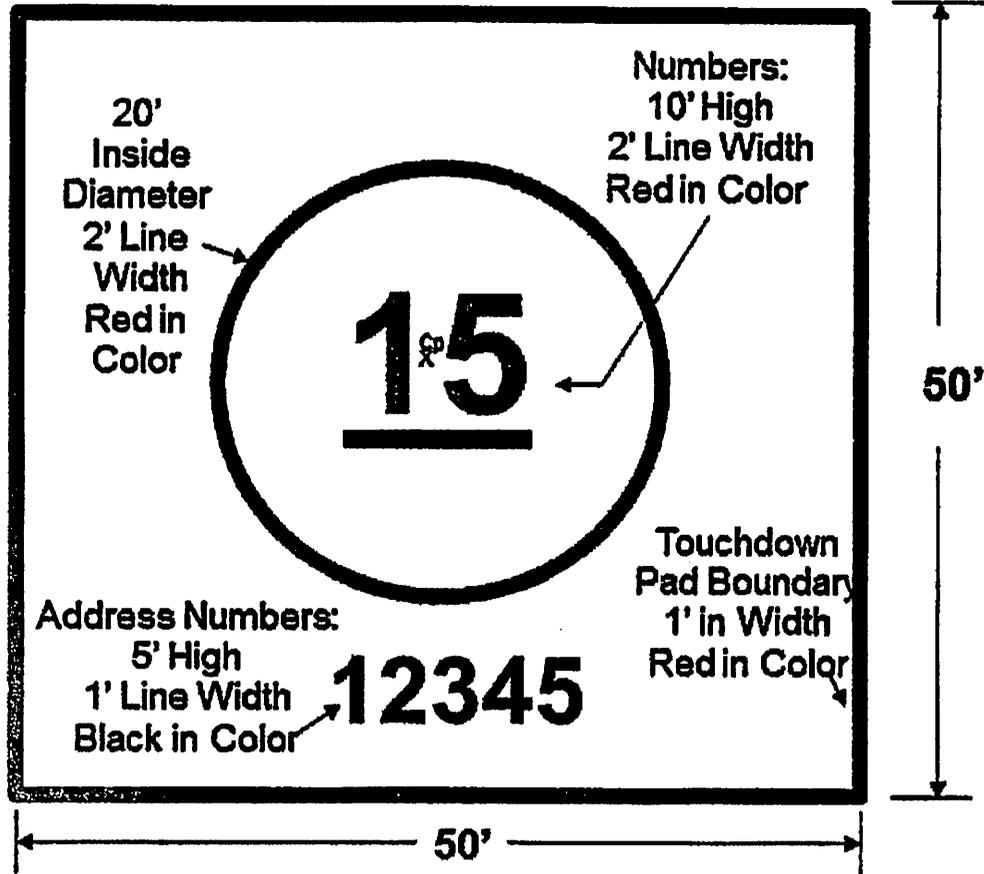
19 **2008.1.9 Standpipe systems.** The standpipe system shall be extended to the roof level
20 on which the EHLF is located. All portions of the EHLF area shall be within 150 feet of a
21 2.5-inch outlet on a Class I or III standpipe.

22 **2008.1.10 Fire extinguishers.** A minimum of one portable fire extinguisher having a
23 minimum 80-B:C rating shall be provided and located near the stairway or ramp to the
24 landing pad. The fire extinguisher cabinets shall not penetrate the approach-departure
25

1 paths, or the safety area. Installation, inspection, and maintenance of extinguishers shall
2 be in accordance with the CFC, Section 906.

3 **2008.1.11 EHLF.** Fueling, maintenance, repairs, or storage of helicopters is prohibited.

4 **Figure 2008.1.7 Helicopter Landing Pad Markings**



- 19
20
21
22
1. The preferred background is white or tan.
 2. The circled center number indicates the allowable weight that the facility is capable of supporting in thousands of pounds.
 3. The numbers shall be orientated towards the preferred flight (typically facing the prevailing wind)

23 **Section 3-3-15. Chapter 21**

24 **Chapter 21 Dry Cleaning** is adopted in its entirety without amendments.

1 **Section 3-3-16. Chapter 22**

2 **Chapter 22 Combustible Dust-Producing Operations** is adopted in its entirety without
3 amendments.

4 **Section 3-3-17. Chapter 23**

5 **Chapter 23 Motor Fuel-Dispensing Facilities and Repair Garages** is adopted in its
6 entirety without amendments.

7
8 **Section 3-3-18. Chapter 24**

9 **Chapter 24 Flammable Finishes** is adopted in its entirety without amendments.

10
11 **Section 3-3-19. Chapter 25**

12 **Chapter 25 Fruit and Crop Ripening** is adopted in its entirety without amendments.

13
14 **Section 3-3-20. Chapter 26**

15 **Chapter 26 Fumigation and Thermal Insecticidal Fogging** is adopted in its entirety
16 without amendments.

17
18 **Section 3-3-21. Chapter 27**

19 **Chapter 27 Semiconductor Fabrication Facilities** is adopted in its entirety without
20 amendments

21
22 **Section 3-3-22. Chapter 28**

23 **Chapter 28 Lumber Yards and Woodworking Facilities** is adopted in its entirety with the
24 following amendments:
25

1 **Section 2801.2 Permit** is hereby revised by adding the following statement to the last
2 sentence:

3 **2801.2 Permit.** Permits shall be required as set forth in Section 105.6. For
4 Miscellaneous Combustible Storage Permit, see Section 105.6.29.

5 **Section 2808.2 Storage site** is hereby revised as follows:

6 **2808.2 Storage site.** Storage sites shall be level and on solid ground or other all-
7 weather surface. Sites shall be thoroughly cleaned and approval from the fire code
8 official obtained before transferring products to the site.

9 **Section 2808.3 Size of piles** is hereby revised as follows:

10 **2808.3 Size of piles.** Piles shall not exceed 15 feet (4572 mm) in height, 50 feet (15
11 240 mm) in width and 100 feet (30 480 mm) in length.

12 **Section 2808.7 Pile fire protection** is hereby revised by adding the following statement to
13 the last sentence:

14 **2808.7 Pile fire protection.** Automatic sprinkler protection shall be provided in
15 conveyor tunnels and combustible enclosures that pass under a pile. Combustible
16 conveyor systems and enclosed conveyor systems shall be equipped with an approved
17 automatic sprinkler system. Oscillating sprinklers with a sufficient projectile reach are
18 required to maintain a 40% to 60% moisture content and wet down burning/smoldering
19 areas.

20 **Section 2808.9 Material-handling equipment,** is hereby revised by adding the following
21 sentence at the beginning of the section:

22 **2808.9 Material-handling equipment.** All material handling equipment operated by
23 an internal combustion engine shall be provided and maintained with an approved spark
24

25

1 arrester. Approved material-handling equipment shall be available for moving wood
2 chips, hogged material, wood fines and raw product during fire-fighting operations.

3 **Section 2808.11 Temperature control**, is hereby added as follows:

4 **2808.11 Temperature control.** The temperature shall be monitored and maintained
5 as specified in Sections 2808.11.1 and 2808.11.2.

6 **Section 2808.11.1 Pile temperature control**, is hereby added as follows:

7 **2808.11.1 Pile temperature control.** Piles shall be rotated when the internal
8 temperature readings are in excess of 165 degrees Fahrenheit.

9 **Section 2808.11.2 New material temperature control**, is hereby added as follows:

10 **2808.11.2 New material temperature control.** New loads delivered to the facility
11 shall be inspected and tested at the facility entry prior to taking delivery. Material with
12 temperature exceeding 165 degrees Fahrenheit shall not be accepted on the site. New
13 loads shall be monitored to verify that the temperature remains stable.

14
15 **Section 3-3-23. Chapter 29**

16 **Chapter 29 Manufacture of Organic Coatings** is adopted in its entirety without
17 amendments.

18
19 **Section 3-3-24. Chapter 30**

20 **Chapter 30 Industrial Ovens** is adopted in its entirety without amendments.

21
22 **Section 3-3-25. Chapter 31**

23 **Chapter 31 Tents and Other Membrane Structures** is adopted in its entirety without
24 amendments.
25

1 **Section 3-3-26. Chapter 32**

2
3 **Chapter 32 High-Piled Combustible Storage** is adopted in its entirety without
4 amendments.

5
6 **Section 3-3-27. Chapter 33**

7 **Chapter 33 Fire Safety During Construction and Demolition** is adopted in its entirety
8 without amendments.

9
10 **Section 3-3-28. Chapter 34**

11 **Chapter 34 Tire Rebuilding and Tire Storage** is adopted in its entirety without
12 amendments.

13
14 **Section 3-3-29. Chapter 35**

15 **Chapter 35 Welding and Other Hot Work** is adopted in its entirety without amendments.

16
17 **Section 3-3-30. Chapter 36**

18 **Chapter 36 Marinas** is adopted in its entirety without amendments.

19
20 **Section 3-3-31. Chapter 48**

21 **Chapter 48 Motion Picture and Television Production Studio Sound Stages, Approved**
22 **Production Facilities and Production Locations** is adopted in its entirety without
23 amendments.
24
25

1 **Section 3-3-32. Chapter 49**

2 **Chapter 49 Requirements for Wildland-Urban Interface Fire Areas** is adopted in its
3 entirety with the following amendments:

4 **Section 4906.3 Vegetation** is hereby revised by adding Section "(5)" as follows:

5 (5) OCFA Vegetation Management Guidelines.

6 **Section 4908 Fuel Modification Requirements for New Construction** is hereby added as
7 follows:

8 **4908 Fuel Modification Requirements for New Construction.** All new buildings to
9 be built or installed in hazardous fire areas shall comply with the following:

- 10
- 11 1. Preliminary fuel modification plans shall be submitted to and approved by the fire
12 code official concurrent with the submittal for approval of any tentative map.
 - 13 2. Final fuel modification plans shall be submitted to and approved by the fire code
14 official prior to the issuance of a grading permit.

15 2.1 The fuel modification plan shall include provisions for the maintenance of the fuel
16 modification for perpetuity.

- 17
- 18 3. The fuel modification plans shall meet the criteria set forth in the Fuel Modification
19 Section of the Orange County Fire Authority Vegetation Management Guidelines.
 - 20 4. The fuel modification plan may be altered if conditions change. Any alterations to the
21 fuel modification areas shall have prior approval from the fire code official.
 - 22 5. All elements of the fuel modification plan shall be maintained in accordance with the
23 approved plan and are subject to the enforcement process outlined in the Fire Code.
- 24

25 **Section 3-3-33. Chapter 50**

1 **Chapter 50 Hazardous Materials – General Provisions** is adopted in its entirety with the
2 following amendments.

3 **Section 5001.5.2 Hazardous Materials Inventory Statement (HMIS)**, is hereby
4 amended by modifying the starting paragraph as follows:

5 **5001.5.2 Hazardous Materials Inventory Statement (HMIS).** Where required by
6 the fire code official, an application for a permit shall include Orange County Fire
7 Authority's Chemical Classification Packet, which shall be completed and approved prior
8 to approval of plans, and/or the storage, use or handling of chemicals on the premises.

9 The Chemical Classification Packet shall include the following information:

- 10 1. Product Name
- 11 2. Component
- 12 3. Chemical Abstract Service (CAS) number
- 13 4. Location where stored or used.
- 14 5. Container size
- 15 6. Hazard classification
- 16 7. Amount in storage
- 17 8. Amount in use-closed systems
- 18 9. Amount in use-open systems.

19 **Table 5003.1.1(1) Maximum Allowable Quantity per Control Area of Hazardous**
20 **Materials Posing a Physical Hazard** is hereby amended by deleting Footnote K without
21 replacement as follows:

22 **Section 5003.1.1.1 Extremely Hazardous Substances** is hereby added as follows:

23 **5003.1.1.1 Extremely Hazardous Substances.** No person shall use or store any
24 amount of extremely hazardous substances (EHS) in excess of the disclosable amounts
25

1 (see Health and Safety Code Section 25500 et al) in a residential zoned or any
2 residentially developed property.

3 **Section 5003.5 Hazard identification signs** is hereby amended by modifying the NFPA
4 standard as follows:

5 **5003.5 Hazard identification signs.** Unless otherwise exempted by the fire code
6 official, visible hazard identification signs as specified in the Orange County Fire
7 Authority Signage Guidelines for the specific material contained shall be placed on
8 stationary containers and above-ground tanks and at entrances to locations where
9 hazardous materials are stored, dispensed, used or handled in quantities requiring a
10 permit and at specific entrances and locations designated by the fire code official.
11

12 **Section 3-3-34. Chapter 51**

13 **Chapter 51 Aerosols** is adopted in its entirety without amendments.
14

15 **Section 3-3-35. Chapter 52**

16 **Chapter 52 Combustible Fibers** is adopted in its entirety without amendments.
17

18 **Section 3-3-36. Chapter 53**

19 **Chapter 53 Compressed Gases** is adopted in its entirety without amendments.
20

21 **Section 3-3-37. Chapter 54**

22 **Chapter 54 Corrosive materials** is adopted in its entirety without amendments.
23

24 **Section 3-3-38. Chapter 55**
25

1 **Chapter 55 Cryogenic Fluids** is adopted in its entirety with the following amendment.

2 **Section 5503.4.1 Identification signs** is hereby revised as follows:

3 **5503.4.1 Identification signs.** Visible hazard identification signs in accordance with
4 the Orange County Fire Authority Signage Guidelines shall be provided at entrances to
5 buildings or areas in which cryogenic fluids are stored, handled or used.

6
7 **Section 3-3-39. Chapter 56**

8 **Chapter 56 Explosives and Fireworks** California Fire Code Chapter 56 is adopted in its
9 entirety with the following amendments:

10 **Section 5601.2 Retail Fireworks** is hereby added as follows:

11 **5601.2 Retail Fireworks.** The storage, use, sale, possession, and handling of
12 fireworks 1.4G (commonly referred to as Safe & Sane) and fireworks 1.3G is prohibited.

13 **Exception:** Fireworks 1.4G and fireworks 1.3G may be part of an electrically fired
14 public display when permitted and conducted by a licensed pyrotechnic operator

15 **Section 5601.3 Seizure of Fireworks** is hereby added as follows:

16 **5601.3 Seizure of Fireworks.** The fire code official shall have the authority to seize,
17 take, remove all fireworks stored, sold, offered for sale, used or handled in violation of
18 the provisions of Title 19 CCR, Chapter 6. Any seizure or removal pursuant to this
19 section shall be in compliance with all applicable statutory, constitutional, and decisional
20 law.

21 **Section 5602 Explosives and blasting** is hereby added as follows:

22 **5602 Explosives and blasting.** Explosives shall not be possessed, kept, stored, sold,
23 offered for sale, given away, used, discharged, transported or disposed of within wildland-
24 urban interface areas, or hazardous fire areas except by permit from the fire code official.
25

1 **Section 5608.1 General** is hereby revised as follows:

2 **5608.1 General.** Outdoor fireworks displays, use of pyrotechnics before a proximate
3 audience and pyrotechnic special effects in theatrical and group entertainment
4 productions shall comply with California Code of Regulations, Title 19, Division 1,
5 Chapter 6 Fireworks, the Orange County Fire Authority Guidelines for Public Fireworks
6 Displays, and with the conditions of the permit as approved by the fire code official.

7 **Section 5608.2 Firing** is hereby added as follows:

8 **5608.2 Firing.** All fireworks displays shall be electrically fired.

9
10 **Section 3-3-40. Chapter 57**

11 **Chapter 57 Flammable and Combustible Liquids** is adopted in its entirety with the
12 following amendment.

13 **Section 5704.2.3.2 Label or placard** is hereby amended by modifying the NFPA standard as
14 follows:

15 **5704.2.3.2 Label or placard.** Tanks more than 100 gallons (379 L) in capacity, which
16 are permanently installed or mounted and used for the storage of Class I, II or III
17 liquids, shall bear a label and placard identifying the material therein. Placards shall be
18 in accordance with the Orange County Fire Authority Signage Guidelines.

19
20 **Section 3-3-41. Chapter 58**

21 **Chapter 58 Flammable Gases and Flammable Cryogenic Fluids** is adopted in its entirety
22 without amendments.

23
24 **Section 3-3-42. Chapter 59**
25

1 **Chapter 59 Flammable Solids** is adopted in its entirety without amendments.

2
3 **Section 3-3-43. Chapter 60**

4 **Chapter 60 Highly Toxic and Toxic Materials** is adopted in its entirety with the following
5 amendments.

6 **Section 6004.2.2.7 Treatment system** is hereby amended by modifying the exceptions as
7 follows:

8 **Exception:**

9 1. Toxic gases – storage/use. Treatment systems are not required for toxic gases
10 supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water
11 capacity when the following are provided:

12 1.1 A listed or approved gas detection system with a sensing interval not
13 exceeding 5 minutes.

14 1.2. For storage, valve outlets are equipped with gas-tight outlet plugs or caps.

15 1.3 For use, a listed and approved automatic-closing fail-safe valve located
16 immediately adjacent to cylinder valves. The fail-safe valve shall close when
17 gas is detected at the permissible exposure limit (PEL) by a gas detection
18 system monitoring the exhaust system at the point of discharge from the gas
19 cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas
20 detection system shall comply with Section 6004.2.2.10.
21

22 **Section 3-3-44. Chapter 61**

23 **Chapter 61 Liquefied Petroleum Gases** is adopted in its entirety without amendments.
24
25

1 **Section 3-3-45. Chapter 62**

2 **Chapter 62 Organic Peroxides** is adopted in its entirety without amendments.

3
4 **Section 3-3-46. Chapter 63**

5 **Chapter 63 Oxidizers, Oxidizing Gases, and Oxidizing Cryogenic Fluids** is adopted in its
6 entirety without amendments.

7
8 **Section 3-3-47. Chapter 64**

9 **Chapter 64 Pyrophoric Materials** is adopted in its entirety without amendments.

10
11 **Section 3-3-48. Chapter 65**

12 **Chapter 65 Pyroxylin (Cellulose Nitrate) Plastics** is adopted in its entirety without
13 amendments.

14
15 **Section 3-3-49. Chapter 66**

16 **Chapter 66 Unstable (Reactive) Materials** is adopted in its entirety without amendments.

17
18 **Section 3-3-50. Chapter 67**

19 **Chapter 67 Water-Reactive Solids and Liquids** is adopted in its entirety without
20 amendments.

21
22 **Section 3-3-51. Chapter 80**

23 **Chapter 80 Referenced Standards** is adopted in its entirety with the following amendments:
24
25

1 **NFPA 13, 2013 Edition, Standard for the Installation of Sprinkler Systems** is hereby
2 amended as follows:

3 **Section 6.8.3 is hereby revised as follows:**

4 **6.8.3** Fire department connections (FDC) shall be of an approved type. The FDC shall
5 contain a minimum of two 2 ½" inlets. The location shall be approved and be no more
6 than 150 feet from a public hydrant. The FDC may be located within 150 feet of a private
7 fire hydrant when approved by the fire code official. The size of piping and the number of
8 inlets shall be approved by the fire code official. If acceptable to the water authority, it
9 may be installed on the backflow assembly. Fire department inlet connections shall be
10 painted OSHA safety red. When the fire sprinkler density design requires 500 gpm
11 (including inside hose stream demand) or greater, or a standpipe system is included, four
12 2 ½" inlets shall be provided.

13 **Section 8.3.3.1 is hereby revised as follows:**

14 **8.3.3.1.** When fire sprinkler systems are installed in shell buildings of undetermined use
15 (Spec Buildings) other than warehouses (S occupancies), fire sprinklers of the quick-
16 response type shall be used. Use is considered undetermined if a specific
17 tenant/occupant is not identified at the time the fire sprinkler plan is submitted.

18 Sprinklers in light hazard occupancies shall be one of the following:

- 19 (1) Quick-response type as defined in 3.6.4.7
20 (2) Residential sprinklers in accordance with the requirements of 8.4.5
21 (3) Standard-response sprinklers used for modifications or additions to existing light
22 hazard systems equipped with standard-response sprinklers
23 (4) Standard-response sprinklers used where individual standard-response sprinklers
24 are replaced in existing light hazard systems
25

1 **Section 8.17.1.1.1 is hereby added as follows**

2 **8.17.1.1.1 Residential Waterflow Alarms.** A local water-flow alarm shall be provided
3 on all sprinkler systems and shall be connected to the building fire alarm or water-flow
4 monitoring system, where provided. Group R occupancies not requiring a fire alarm
5 system by the California Fire Code shall be provided with a minimum of one approved
6 interior alarm device in each unit. Interior alarm devices shall be required to provide 55
7 dBA or 15 dBA above ambient, whichever is greater, throughout all living spaces within
8 each unit. Sound levels in all sleeping areas with all intervening doors closed shall be a
9 minimum of 15 dBA above the average ambient sound level but not less than 75 dBA,
10 whichever is greater. When not connected to a fire alarm or water-flow monitoring
11 system, audible devices shall be powered from an uninterruptible circuit (except for
12 over-current protection) serving normally operated appliances in the residence.

13 **Section 11.1.1.2 is hereby added as follows:**

14 **11.1.1.2** When fire sprinkler systems are required in buildings of undetermined use
15 other than warehouses, they shall be designed and installed to have a fire sprinkler
16 density of not less than that required for an Ordinary Hazard Group 2 use, with no
17 reduction(s) in density or design area. Warehouse fire sprinkler systems shall be
18 designed to Figure 16.2.1.3.2 (d) curve "G". Use is considered undetermined if a specific
19 tenant/occupant is not identified at the time the sprinkler plan is submitted. Where a
20 subsequent occupancy requires a system with greater capability, it shall be the
21 responsibility of the occupant to upgrade the system to the required density for the new
22 occupancy.

23 **Section 11.2.3.1.1.1 is hereby added as follows:**

24
25

1 **11.2.3.1.1.1** The available water supply for fire sprinkler system design shall be
2 determined by one of the following methods, as approved by the Fire Code Official:

- 3 1) Subtract the project site elevation from the low water level for the appropriate
4 pressure zone and multiply the result by 0.433;
5 2) Use a maximum of 40 psi, if available;
6 3) Utilize the Orange County Fire Authority water-flow test form/directions to
7 document a flow test conducted by the local water agency or an approved third
8 party licensed in the State of California.

9 **Section 23.2.1.1** is hereby revised as follows:

10 **Section 23.2.1.1** Where a waterflow test is used for the purposes of system design,
11 the test shall be conducted no more than 6 months prior to working plan submittal
12 unless otherwise approved by the authority having jurisdiction.

13 **NFPA 13R 2013 Edition, Installation of Sprinkler System in Residential Occupancies**
14 **up to and Including Four Stories in Height** is hereby amended as follows:

15 **Section 6.16.1** is hereby revised as follows:

16 **6.16.1** A local water-flow alarms shall be provided on all sprinkler systems and shall be
17 connected to the building fire alarm or water-flow monitoring system where provided.
18 Group R occupancies containing less than the number of stories, dwelling units or
19 occupant load specified in the California Fire Code as requiring a fire alarm system shall
20 be provided with a minimum of one approved interior alarm device in each unit. Interior
21 alarm devices shall be required to provide 55 dBA or 15 dBA above ambient, whichever
22 is greater, throughout all living spaces within each dwelling unit. Sound levels in all
23 sleeping areas with all intervening doors closed shall be a minimum of 15 dBA above the
24 average ambient sound level but not less than 75 dBA, whichever is greater. When not
25

1 connected to a fire alarm or water-flow monitoring system, audible devices shall be
2 powered from an uninterruptible circuit (except for over-current protection) serving
3 normally operated appliances in the residence.

4 There shall also be a minimum of one exterior alarm indicating device, listed for outside
5 service and audible from the access roadway that serves that building.

6 **NFPA 13D 2013 Edition, Standard for the Installation of Sprinkler Systems in One-**
7 **and Two-Family Dwellings and Manufactured Homes** is hereby amended as follows:

8 **Section 4.1.3** is hereby added as follows:

9 **4.1.3 Stock of Spare Sprinklers**

10 **Section 4.1.3.1** is hereby added as follows:

11 **4.1.3.1.** A supply of at least two sprinklers for each type shall be maintained on the
12 premises so that any sprinklers that have operated or been damaged in any way can be
13 promptly replaced.

14 **Section 4.1.3.2** is hereby added as follows:

15 **4.1.3.2** The sprinklers shall correspond to the types and temperature ratings of the
16 sprinklers in the property.

17 **Section 4.1.3.3** is hereby added as follows:

18 **4.1.3.3** The sprinklers shall be kept in a cabinet located where the temperature to
19 which they are subjected will at no time exceed 100 °F (38°C).

20 **Section 4.1.3.4** is hereby added as follows:

21 **4.1.3.4** A special sprinkler wrench shall be provided and kept in the cabinet to be used
22 in the removal and installation of sprinklers. One sprinkler wrench shall be provided for
23 each type of sprinkler installed.

24 **Section 7.1.2** is hereby revised as follows:
25

1 **7.1.2** The system piping shall not have a separate control valve unless supervised by a
2 central station, proprietary, or remote station alarm service.

3 **Section 7.6** is hereby deleted in its entirety and replaced as follows:

4 **7.6 Alarms.** Exterior alarm indicating device shall be listed for outside service and
5 audible from the street from which the house is addressed. Exterior audible devices shall
6 be placed on the front or side of the structure and the location is subject to final
7 approval by the fire code official. Additional interior alarm devices shall be required to
8 provide 55 dBA or 15 dBA above ambient, whichever is greater, throughout all living
9 spaces. Sound levels in all sleeping areas with all intervening doors closed shall be a
10 minimum of 15 dBA above the average ambient sound level but not less than 75 dBA,
11 whichever is greater. Audible devices shall be powered from an uninterruptible circuit
12 (except for over-current protection) serving normally operated appliances in the
13 residence.

14 **Exceptions:**

- 15 1. When an approved water flow monitoring system is installed,
16 interior audible devices may be powered through the fire alarm control panel.
17 2. When smoke detectors specified under CBC Section 907.2.11
18 are used to sound an alarm upon waterflow switch activation.
19

20 **NFPA 14, 2013 Edition, Installation of Standpipe and Hose Systems** is hereby amended
21 as follows:

22 **Section 7.3.1.1** is hereby is deleted in its entirety and replaced as follows:

23 **7.3.1.1** Class I and III Standpipe hose connections shall be unobstructed and shall be
24 located not less than 18 inches or more than 24 inches above the finished floor. Class II
25

Standpipe hose connections shall be unobstructed and shall be located not less than 3 feet or more than 5 feet above the finished floor.

NFPA 24, 2013 Edition, Standard for the Installation of Private Fire Service Mains and Their Appurtenances is hereby amended as follows:

Section 6.2.1.1 is hereby added as follows:

6.2.1.1 The closest upstream indicating valve to the riser shall be painted OSHA red.

Section 6.2.11 (5) is hereby deleted without replacement and (6) and (7) renumbered:

(5) Control Valves installed in a fire-rated room accessible from the exterior.

(6) Control valves in a fire-rated stair enclosure accessible from the exterior as permitted by the authority having jurisdiction.

Section 6.3.3 is hereby added as follows:

Section 6.3.3 All post indicator valves controlling fire suppression water supplies shall be painted OSHA red.

Section 10.1.6.3 is hereby added as follows:

10.1.6.3 All ferrous pipe shall be coated and wrapped. Joints shall be coated and wrapped after assembly. All fittings shall be protected with a loose 8-mil polyethylene tube. The ends of the tube shall extend past the joint by a minimum of 12 inches and be sealed with 2 inch wide tape approved for underground use. Galvanizing does not meet the requirements of this section.

Exception: 304 or 316 Stainless Steel pipe and fittings

Section 10.3.6.2 is hereby revised as follows:

10.3.6.2 All bolted joint accessories shall be cleaned and thoroughly coated with asphalt or other corrosion-retarding material, prior to poly-tube, and after installation.

Exception: Bolted joint accessories made from 304 or 316 stainless steel.

1 **Section 10.3.6.3** is hereby added as follows:

2 **10.3.6.3** All bolts used in pipe-joint assembly shall be 316 stainless steel.

3 **Section 10.6.3.1** is hereby deleted and replaced as follows:

4 **10.6.3.1** Where fire service mains enter the building adjacent to the foundation,-the
5 pipe may run under a building to a maximum of 24 inches, as measured from the
6 interior face of the exterior wall to the center of the vertical pipe. The pipe under the
7 building or building foundation shall be 304 or 316 stainless steel and shall not contain
8 mechanical joints or it shall comply with 10.6.2.

9 **Section 10.6.4** is hereby revised as follows:

10 **10.6.4** Pipe joints shall not be located under foundation footings. The pipe under the
11 building or building foundation shall be 304 or 316 stainless steel and shall not contain
12 mechanical joints.
13

14 **Appendices**

15 **Appendix B** is adopted in its entirety without amendments.

16 **Appendix BB** is adopted in its entirety without amendments.

17 **Appendix C** is adopted in its entirety without amendments.

18 **Appendix CC** is adopted in its entirety without amendments.
19

20 This ordinance shall take effect and be in full force thirty (30) days from and after its passage
21 and before the expiration of fifteen (15) days after the passage thereof, shall be published once
22 in an adjudicated newspaper in the County of Orange.
23
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THE

FORGOING was PASSED and ADOPTED by the following vote of the Orange County Board of Supervisors on December 17, 2013, to wit:

AYES: Supervisors: JOHN M.W. MOORLACH, SHAWN NELSON, JANET NGUYEN

TODD

SPLITZER, PATRICIA BATES

NOES:

EXCUSED:

ABSTAINED:

(Signature on File)

Susan Novak, Clerk of the Board of Supervisors, County of Orange, California

This ordinance shall take effect and be in full force thirty (30) days from and after its passage and before the expiration of fifteen (15) days after the passage thereof, shall be published once in an adjudicated newspaper in the County of Orange.

THE FOREGOING was **PASSED** and **ADOPTED** by the following vote of the Orange County Board of Supervisors on December 17, 2013, to wit:

**AYES: Supervisors: JOHN M.W. MOORLACH, SHAWN NELSON, JANET NGUYEN
TODD SPITZER, PATRICIA BATES**

**NOES:
EXCUSED:
ABSTAINED:**



CHAIRMAN

STATE OF CALIFORNIA)
) ss:
COUNTY OF ORANGE)

I, SUSAN NOVAK, Clerk of the Board of Orange County, California, hereby certify that a copy of this document has been delivered to the Chairman of the Board and that the above and foregoing Ordinance was duly and regularly adopted by the Orange County Board of Supervisors.

IN WITNESS WHEREOF, I have hereto set my hand and seal.



SUSAN NOVAK
Clerk of the Board.
County of Orange, State of California



Ordinance No.: 13-014
Agenda Date: 12/17/2013
Item No.: 69



I certify that the foregoing is a true and correct copy of the Ordinance adopted by the Board of Supervisors, Orange County, State of California

Susan Novak, Clerk of the Board of Supervisors

By: _____
Deputy

ORANGE COUNTY FIRE AUTHORITY

Planning & Development Services Section

1 Fire Authority Road, Building A Irvine, CA 92602 714-573-6100 www.ocfa.org

Fire Master Plans for Commercial & Residential Development



Guideline B-09

Date: January 1, 2014
(revised January 1, 2016)

Serving the Cities of: Aliso Viejo • Buena Park • Cypress • Dana Point • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods • Lake Forest • La Palma • Los Alamitos • Mission Viejo • Placentia • Rancho Santa Margarita • San Clemente • San Juan Capistrano • Seal Beach • Santa Ana • Stanton • Tustin • Villa Park • Westminster • Yorba Linda • and Unincorporated Areas of Orange County

Guideline B-09: Fire Master Plans for Commercial & Residential Development

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Guideline B-09: Fire Master Plans for Commercial & Residential Development

PURPOSE

The effectiveness of emergency response and firefighting operations is directly related to the proper installation and maintenance of fire access roadways, the proper sitting of hydrants, adequate water supply, and access to structures. This document is a general guideline pertaining to the creation and maintenance of fire department access roadways, access walkways to and around buildings, and hydrant quantity and placement as required by the 2013 California Fire and Building Codes (CFC and CBC) and as amended by local ordinance. This guideline includes requirements for:

- Plan submittal
- Fire access roadway design
- Fire lane identification
- Premises identification
- Fire lane obstructions
- Access for residential development
- Alternative engineered fire access systems
- Access requirements in wildfire risk areas
- Hydrant quantity, spacing, placement, and identification
- Water availability and fire flow
- Access to structures
- Access during construction
- Fire Safe Regulations for State Responsibility Areas (SRA)

SCOPE

These guidelines apply to new, remodeled, reconstructed, or relocated residential or commercial structures and developments to which emergency response may be necessary. The information contained in this document is intended to assist the applicant in attaining compliance and to ensure that privately owned roadways necessary for emergency response purposes will be available for use at all times. Some of the issues discussed within this document may be covered in more detail through other OCFA guidelines, as referenced. Areas of particular importance and requirements that are commonly overlooked on fire master plan submittals have been identified with a black arrow in the left margin. Items available on the OCFA website (www.ocfa.org) will be identified by underlining.

NOTE!

For projects located in State Responsibility Areas (SRA), this Guideline must be used in conjunction with the detailed fire safe regulations (FSR) in Guideline B-09a to ensure that the project complies with applicable local and state fire access and hydrant requirements.

The following definitions are provided to facilitate the consistent application of this guideline:

Access Walkways - An approved walking surface leading from fire access roadways to exterior doors, the area beneath rescue windows, and other required openings in structures.

Bollards - Permanent or removable poles that are placed across a roadway for the purpose of restricting vehicular access to a portion of a site or to protect a piece of equipment from potential vehicular damage. Bollards are not permitted across a fire access roadway.

Fire Apparatus Access Roads - The means for emergency apparatus to access a facility or structure for emergency purposes. Roadways must extend to within 150 feet of all portions of the exterior of the first floor of any structure and must meet specified criteria for width, pavement characteristics, roadway gradient, turning radius, etc. Fire apparatus access roads are also referred to as fire lanes.

Fire Lane Identification – Signs or curb markings that allow fire apparatus access roads to be readily recognized so that they will remain unobstructed and available for emergency use at all times.

Gates and Barriers - Devices that restrict pedestrian and vehicle ingress and egress to and from a facility.

Gate and Barrier Locks - Devices that are installed on gates and barriers to secure a property or facility.

Hose Pull – The effective distance (150 feet is standard) that firefighters can drag a hose from fire apparatus to attack a fire. Hose pull is measured along a simulated path of travel accounting for obstructions and not “as the crow flies.” See Attachments 27 and 29.

Premises Identification - The visual means (address numbers) used to readily identify a property or facility street address. It may also be used to distinguish separate buildings within a single facility or property.

Rescue Openings – Exterior doors or windows required in sleeping rooms in R occupancies located below the fourth story of a building that allow rescue of trapped occupants. See CBC Section 1029.

State Responsibility Area (SRA) – Land where the State of California has primary *financial* responsibility for the prevention and suppression of wildland fires. All SRA land is located within County unincorporated areas; SRA does not include lands within city boundaries or in federal ownership. A map showing SRA lands within Orange County can be found at: http://frap.fire.ca.gov/data/frapgismaps/sra11_2/sramap.30.pdf. For access and hydrant requirements for projects in the SRA, also refer to Guideline B-09a.

Very High Fire Hazard Severity Zone (VHFHSZ) – A designated area in which the type and condition of vegetation, topography, fire history, and other relevant factors increase the possibility of uncontrollable wildland fire. Structures within a VHFHSZ require special construction features to protect against wildfire hazards; please consult with the local building department and refer to CBC Chapter 7A for specific requirements.

Wildfire Risk Area - Land that is covered with vegetation, which is so situated or is of such inaccessible location that a fire originating upon it would present an abnormally difficult job of suppression or would result in great or unusual damage through fire, or such areas designated by the fire code official. For purposes of this document, Wildfire Risk Area includes Very High Fire Hazard Severity Zones (see above), Wildland-Urban Interfaces (WUI), and similarly hazardous areas.

SUBMITTAL REQUIREMENTS

1. Plan Submittal Requirements

Plans shall be provided to demonstrate compliance with all codes and other regulations governing water availability for firefighting and emergency access to sites and structures within the jurisdictions served by the OCFA. In addition, changes to existing structures or sites shall be reviewed by the OCFA to ensure that the modifications do not affect water availability or access.

- A. Submittals – Two plan sets will need to be submitted at the location specified in the OCFA Plan Submittal Routing list. In addition, an electronic copy of the plan in .pdf format on a CD, USB memory stick, or other acceptable medium shall be provided; an electronic copy of the plan in .dwg format may also be required for some projects—see Section 1.H below. Accompanying sets of documentation for items such as gates, water availability data, paving certification, soil gas assessment (See Guideline C-03), and conditions of approval shall be supplied, as needed. The OCFA plan review and inspection fee, as well as any city administrative fees, is due upon submittal of plans. Refer to the OCFA Fee Schedule for the current fire master plan fee.
- B. Scope – The scope of work shall be clearly indicated on the plan. If the building or site in question was approved previously, include the OCFA Service Request number of that prior approval on the new plans. A copy of the previously approved fire master plan shall be submitted along with new plan sets for any revision.
- C. Building Data – Information related to the building’s location, use, and construction shall be clearly indicated on the plan.

NOTE!

- 1) Include the project’s street address (or a working or proposed address of the job trailer or future building on the site if an address is not assigned yet) and the tract, tentative tract, or parcel *map* number (this is NOT the County Assessor’s parcel number or APN).
- 2) Indicate the types of occupancies that will be housed in the structure as listed in California Building Code (CBC) Section 302.
- 3) Indicate the construction type of each building and whether footnote ‘d’ from Table 601 is being applied for a 1-hour construction type equivalency.
- 4) Indicate the building height on the plans as defined in CBC Chapter 2. If the building height is greater than 50 feet, also indicate the elevation change (measured from finished floor to finished floor) between the lowest floor giving access to the structure and the highest occupied floor or occupied roof deck. If this distance is more than 55 feet, the building will be subject to additional requirements for high-rise structures; see OCFA Guideline H-01.

NOTE!

- 5) Note the type of sprinkler system installed/proposed (e.g., NFPA 13, 13-R, or 13-D).
- 6) For unsprinklered structures larger than 6,000 square feet or sprinklered structures larger than 18,000 square feet, provide an allowable area calculation (and a mixed occupancy calculation, if the building houses multiple occupancies) to demonstrate that the building can be of the specified size and construction type. *CBC Table 503, 506*

NOTE!

- D. Fire Master Plan Notes – Include the OCFA Fire Master Plan Notes on the plan. Some notes may need to be customized depending on the type of project or scope of work. See Attachment 1.

NOTE!

- E. Water Availability – To facilitate the review process and avoid untimely delays in project approval, applicants are strongly encouraged to arrange a hydrant flow test with the local water department *prior to submitting plans to the OCFA* if the project includes a new structure or increase in the floor area of an existing structure. Water availability information may not be required to be submitted for every project, and plans may be submitted with a hydrant flow test pending, but the applicant should understand that project approval may be delayed if it is determined during review that this information is required. If the project requires evaluation of the available fire flow, it will not be approved without a completed OCFA Water Availability form or equivalent data sheets from a water district. Water availability information must be no older than six months.
- F. Conditions of Approval – To ensure consistency of the fire master plan with project conditions, include any conditions of approval pertaining to OCFA review of the project on the plans. If the project does not require review and entitlement by the Planning Commission, City Council, Board of Supervisors, or similar body, or the planning department permit review process is required but has not yet been completed, please state this on the plan. If you are unsure whether your project requires planning approval, please contact your city or County planner.
- G. Complete Attachment 2, Fire Master Plan Submittal Checklist, and verify that basic project information has been provided and that general access and water requirements have been addressed on the plan.

NOTE!

- H. Operations pre-emergency incident planning disk - Submit an electronic copy of the fire master plan on a compact disk prior to or upon pick-up of approved plans. This information is used by emergency response personnel to efficiently manage emergency incident activities and resources. If an electronic file containing the required data is not provided, the applicant will be assessed the pre-emergency incident planning fee to offset costs associated with the development of such documentation by OCFA Operations personnel. Fire master plans depicting single family residential developments or temporary site conditions are exempt from this requirement. Other projects requiring a fire master plan may also be exempted at the discretion of the OCFA depending on the scope of the project or extent of modification to the site.

- 1) CDs must be labeled with the OCFA service request number, project name, date, street address (e.g. 123 Main Street), and city. If the address is not available, provide the tract or parcel *map* number (*not* the County Assessor's Parcel Number) and city.
- 2) The drawings must be provided in two file formats: .dwg *and* .pdf.
- 3) The following information shall be provided in the drawing:
 - a) Vicinity map indicating cross streets
 - b) Complete building address, apartment designators, suite numbers (when defined), etc.
 - c) Scaled site plan inclusive of the following information:
 - Detailed building footprint with all entrances identified
 - All on-site access roadways
 - Parking configuration
 - All on-site walking paths around buildings
 - Any barriers that affect movement on the property (walls, fences, gates, etc.)
 - Fire hydrant locations
 - Knox box locations
- 4) The following information should be provided in the drawing, if available:
 - Fire sprinkler/standpipe control valve locations
 - Fire sprinkler/standpipe fire department connection (FDC) location
 - Fire alarm control panel (FACP) and remote annunciator locations
 - Global positioning system (GPS) coordinates for each corner the property. Coordinates must be NAD83 Datum, California zone 6, with units represented in feet.
- 5) All information should be structured into layers within the .dwg file and be visually distinct within the .pdf file.

2. Fire Access Roadways

Fire access roadways, commonly referred to as fire lanes, shall be provided for every facility or building when any portion of an exterior wall of the first story is located more than 150 feet from a public roadway, as measured along an approved route. Extenuating circumstances, increased hazards, and additional fire safety features may affect these requirements. For additional information related to residential tract development, see Section 6. For information related to access during construction, see Section 10. For projects in the SRA, also see Guideline B-09a. *CFC 503*

- A. Fire Apparatus Access Road Design - Fire access roadways must be engineered to support emergency response apparatus. Roadways must be designed to facilitate turning radii of apparatus and meet requirements for gradient, height clearance, and width. Specific criteria pertaining to the design of fire access roadways are detailed below.



1) Fire access roadways shall be designed, constructed, and maintained to support the imposed loads of OCFA fire apparatus with a total weight of 68,000 pounds (75,000 pounds for projects located in the SRA—see FSR Section 1273.02 in Guideline B-09a). Apparatus weight is distributed as 46,000 pounds on tandem rear axles and 22,000 pounds on the front axle. The surface shall be designed, constructed, and maintained to provide all-weather driving capabilities. *A letter or statement, wet-stamped and signed by a registered engineer, shall be provided on the plans certifying that any new roadway meets this 68,000-pound (75,000 pounds for projects in the SRA), all-weather requirement.* Road base without an appropriate topping or binding material does not satisfy the all-weather requirement. *CFC 503.2.3*

2) Number of Fire Apparatus Access Roads Required:

a) One is required if any portion of an exterior wall of the first story of a building is located more than 150 feet from a fire access roadway. That access is to be measured by an approved route around the exterior of the building (see Section 9: Access to Structures and Attachment 27). *CFC 503.1.1*

EXCEPTION: Hose-pull distance to the main entry door of a detached single-family home or duplex or related accessory structure (poolhouse, casita, garage, workshop, barn, etc.) may be up to 300 feet when protected throughout by a sprinkler system. See Section 6.C.

EXCEPTION: When approved by the fire code official, this distance may be increased to 300 feet for open parking garages that comply with either 1 or 2 below:

- 1) The structure is protected throughout with an NFPA 13 sprinkler system; or
- 2) The structure meets all of the following requirements:
 - a. Two stairways are directly accessible via exterior doors/doorways.
 - b. These stairways provide direct access to all tiers of the parking structure.
 - c. These stairways are equipped with Class I wet standpipe outlets at each floor or intermediate landing.
 - d. The doors/doorways serving these stairs are within 40' travel distance from a fire access roadway.
 - e. These stairs are sufficiently separated and located in a manner that facilitates firefighting operations within the structure, as determined by the fire code official.

b) More than one road is required if it is determined that access by a single road may be insufficient due to terrain, location, travel distance, potential fire or life-safety hazards, or other factors that could limit access or if vehicle congestion, railways, or weather conditions could impair the single entry point. Supplementary access points shall be located to facilitate evacuation and emergency operations and minimize congestion or obstruction during an emergency incident. *CFC 503.1.2*

- i. A minimum of two vehicle access points is required for any development containing 150 or more residential units.
- ii. A secondary access point may also be required for commercial projects more than 124,000 sq.ft. in building area. Requirements may vary depending on factors such as building use, expected vehicle and occupant load on site, traffic stacking, or impact on surrounding streets. When specified, OCFA staff will coordinate with the local jurisdiction's community development and public works or engineering departments.
- iii. For projects in the SRA, see also FSR Section 1273.09 in Guideline B-09a.

3) Location of Fire Apparatus Access Roads:

For purposes of determining the suitability of public roads and fire access roadways for staging fire apparatus and facilitating fire suppression operations for a particular structure, the following criteria shall apply:

- a) To protect fire apparatus, personnel, and equipment from damage and injury from falling debris, the edge of fire access roadways serving multi-story buildings should be located no closer than 10 to 30 feet from the building, the actual distance being a function of overall building height with consideration given to building construction, presence of openings, and other potential hazards. As distances greater than 40 feet inhibit the use of vehicle-mounted ladders while distances closer than 20 feet do not allow for a proper laddering angle, the edge of fire lanes serving structures four or more stories in height shall be located between 20 and 40 feet from the building. These distances are measured from the face of the building to the top edge of the curb face or rolled curb flow line nearest the structure. To ensure that vehicular access and egress from dead-end fire access roadways serving multi-story buildings are maintained at all times, staging areas shall be provided along the roadway to permit fire apparatus to pass ladder trucks that have outriggers extended. Consideration shall be given to the length of the roadway, roof and building design, obstructions to laddering, and other operational factors in determining the number, location, and configuration of such staging areas. *CFC 503.1.1, 503.2.2*
- b) Access may be taken from an on-site fire apparatus access road or from a public road with an average daily trip (ADT) count below 30,000 unless a recorded access easement agreement is in effect to obtain access from adjacent properties. Contact the city or County Traffic Engineer's office or Public Works Department for ADT information. *CFC 503.1.1, 503.1.2*
- c) Public roads with an ADT count of 30,000 or more may be acceptable as a fire department access point serving an adjacent site when certain conditions and features (e.g., vehicle turnouts, acceleration/deceleration lanes) are present that limit the hazard to firefighters and other drivers. Such access roads will be evaluated on a case-by-case basis. *CFC 503.1.1, 503.1.2*

- 4) Width of Fire Access Roads - The minimum width of a fire access roadway is 20 feet. If a center median is included, the required width shall be provided on both sides of the median. *CFC 503.2.1, 503.4, 503.2.2*



NOTE!

In wildfire risk areas, fire lanes shall be at least 28 feet wide; *Exception: fire lanes that are 150 feet or less in length may be 24 feet wide if serving one to three dwelling units; where all structures served by the fire lane are protected with fire sprinklers, this length may be increased to 400 feet.* This width shall be provided to a logical termination outside of the wildfire risk area. Refer to the Fire Hazard Severity Zone maps or contact the OCFA Planning and Development Services Section to determine whether your project is located within a wildfire risk area.

The minimum width of roadways in the SRA may vary from these requirements depending on whether they are a required fire lane and other factors; please refer to Guideline B-09a for specific requirements.

The width of fire department access roads is measured from top face of the curb to top face of the curb on streets with standard vertical curbs and gutters, and from flow line to flow line on streets with rolled, sloped, flared, or other non-vertical curb and gutter configurations. Flow line is the lowest continuous elevation on a curb. Road sections and curb details or approved city street improvement plans may be required to verify method of measurement.

- 5) Parking Restrictions - No parking is permitted on roadways that are narrower than 28 feet in width. Parking on one side is permitted on a roadway that is at least 28 feet but less than 36 feet in width. Parking on two sides is permitted on a roadway 36 feet or more in width. These restrictions apply to all roads serving as fire lanes, including those located in wildfire risk areas. See Attachment 3. *Note: Minimum street widths for allowed parking may be more restrictive in some cities. Check with the local Planning Department for specific requirements. CFC 503.4*



NOTE!

- 6) Vertical Clearance - Fire access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches (15 feet for driveways and at gates for projects in the SRA; see FSR Sections 1273.10 and 11 in Guideline B-09a). If trees are located adjacent to the fire access roadway, place a note on the plans stating that all vegetation overhanging the fire access roadway shall be maintained to provide a clear height of 13 feet 6 inches (or 15 feet, if applicable) at all times. See Attachments 4 and 5. *CFC 503.2.1*
- 7) Fire Apparatus Access Road Grade - The grade for access roads shall not exceed 10% or 5.7 degrees (7% or 4 degrees in Irvine unless otherwise approved by the City Engineer). The grade may be increased to a maximum of 15% or 8.5 degrees for approved lengths of access roadways, when all structures served by the access road are protected by automatic fire sprinkler systems. Cross-slope shall not be greater than 2% for paved access roadways. *CFC 503.2.7, 503.2.8*

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- 8) Inside and Outside Turning Radii - The inside turning radius for an access road shall be 17 feet or greater. The outside turning radius for an access road shall be 38 feet or greater. As fire apparatus are unable to negotiate tight “S” curves, a 56-foot straight leg must be provided between these types of compound turns or the radii and/or road width must be increased accordingly. See Attachment 6. Minimum radii for projects in SRA may be greater; see Guideline B-09a. *Note: to accommodate the OCFA’s largest fire apparatus an inside and outside turning radius of 20 and 42 feet, respectively, is recommended and requested. CFC 503.2.4*
 - 9) Dead-end Access Roadways - Dead-end roadways in excess of 150 feet shall be designed and constructed with approved turnarounds or hammerheads. Turnarounds shall meet the turning radius requirements identified above. The minimum cul-de-sac radius is 38 feet with no parking allowed. The maximum length of a cul-de-sac or other dead-end road without mid-way turnarounds or other mitigating features is 800 feet. See Attachment 7. Additional turnarounds may be required for projects in the SRA—see FSR Sections 1273.09 and 10 in Guideline B-09a. *Note: to accommodate the OCFA’s largest fire apparatus, an outside turning radius of 42 feet or larger is recommended and requested. CFC 503.2.5*
 - 10) Bridges - When a bridge is required as part of an access road, it shall be a minimum of 20’ in width and designed and constructed to accommodate a total weight of 68,000 pounds (75,000 pounds for projects in the SRA—see FSR Sections 1273.02 and 07 in Guideline B-09a). Apparatus weight is distributed as 46,000 pounds on tandem rear axles and 22,000 pounds on the front axle. *CFC 503.2.6*
 - 11) Median breaks - Where medians or raised islands are proposed that prevent emergency apparatus from crossing over into opposing traffic lanes, breaks or pass-throughs may be required to be provided. The location and design specifications for the pass-throughs shall be coordinated with the city/County public works or engineering department. *CFC 503.1.2*
 - 12) Continuity of fire lanes – When any portion of a street, drive aisle, or other roadway is required to be a fire lane and the roadway is longer than 150 feet, the remainder of the roadway shall be treated as a fire lane to a logical point of termination at another approved fire lane; at an approved hammerhead or turnaround; at an intersection with a public road suitable for use as a fire lane.

At the discretion of the fire code official, if the portion of the roadway that is required to be a fire lane is no more than 150 feet long, the fire lane may be terminated at that point provided that the remainder of the roadway beyond is clearly not suitable or intended for use as a fire lane. This may be due to factors including, but not limited to, insufficient width or vertical clearance, excessive grade, change in paving material/driveway apron, or other physical constraints or obvious visual indicators, as approved. *CFC 503.1.1, 503.2.5*

3. Fire Access Roadway Identification *CFC 503.3*

Fire lane identification will be required when it is necessary to restrict parking of vehicles in order to maintain the required width of fire access roadways for emergency vehicle use. Unlawful use of fire lanes will be enforced by the local law enforcement agency in accordance with the California Vehicle Code (CVC). See Attachment 8.

-  A. Sign and Curb Marking Options - Areas designated as a fire lane require an acceptable method of marking that shall be approved prior to installation. Examples of dimensions and acceptable options for signage installations and markings are found in Attachments 9 through 14. The following methods are acceptable means of identifying designated fire lanes for public and private streets. Choose either option 1 *OR* option 2 below. Acceptable signage and/or marking requirements for streets in each jurisdiction must be verified with the appropriate city or County public works, community development, or traffic engineering department prior to submittal to the OCFA. Where parking is otherwise restricted by city/County planning or traffic standards, and no parking zones are clearly identified with signs or curb markings in accordance with those standards, additional “FIRE LANE—NO PARKING” signs are not required, when approved by the Fire Code Official.

- 1 - Specific areas designated by the OCFA as fire lanes must be marked with red curbs meeting the specifications in Attachment 9. In addition, where the number of entrances into the area marked with fire lanes is limited, all such vehicle entrances to the designated area shall be posted with approved fire lane entrance signs meeting the specifications in Attachment 10. This option is preferred by the OCFA.
- 2 - “Fire Lane—No Parking” signs meeting the specifications in Attachment 12 shall be posted immediately adjacent to each designated fire lane and at intervals not to exceed 50 feet, unless otherwise approved by the fire code official. In addition, where the number of entrances into the area marked with fire lanes is limited, all such vehicle entrances to the designated area shall be posted with approved fire lane entrance signs.

 *Note: All alternative signs must be approved through the OCFA and by the city/County engineer and/or police agency, as applicable. In areas where fire lane parking restrictions are enforced by the California Highway Patrol, “NO STOPPING—FIRE LANE” signs meeting Caltrans standards shall be used.*

4. Premises Identification *CBC 501.2, CFC 505.1*

Three possible configurations of buildings or units within a building may exist and are identified as follows: freestanding buildings, multi-unit buildings, or multi-building clusters. Common to all configurations are the requirements listed in sections A through E below. Projects may also be subject to specific address and wayfinding signage requirements contained in the local jurisdiction’s municipal ordinance or security code, which may be more restrictive than the requirements listed in this guideline. For projects located in the city

of Irvine, please see Irvine Uniform Security Code, Sections 5-9-516.B & C and Section 5-9-517L. For projects located in SRA land, please see FSR Article 3 in Guideline B-09a for additional addressing requirements.

- A. Approved numbers or addresses shall be placed on the front elevation of all new or existing buildings in such a position that is plainly visible and legible from the street or road on which the property is addressed. Addresses shall not be located where they have the potential of being obstructed by signs, awnings, vegetation, or other building/site elements. An address monument at the vehicle entrance or other location clearly visible and legible from the public road may be provided in lieu of an address on the structure where only a single building with a single street address is present and no other structures are accessible from the fire lane serving that structure.
- B. The numbers shall contrast with their background.
- C. The numbers shall be a minimum of 4 inches or more in height for single-family residential structures/duplexes, or individual unit numbers in multi-family residential structures and 6 inches or more for commercial structures or the primary building address or address range posted on multi-family residential structures. The 6-inch numbers shall have a one-inch stroke and the 4-inch numbers shall have a ½-inch stroke, or as required by local ordinance, whichever is more restrictive. Building setbacks, elevation, and landscaping can affect these minimum size requirements.
- D. Address numbers may be required to internally or externally illuminated by the local jurisdiction's security code. While not required by the OCFA, illumination of addresses is recommended to facilitate rapid location of a site or building.
- E. Where it is unclear as to which street a building is addressed to (e.g., a building is accessed only from a street other than the one it is addressed to; multiple main entrances to the site, or building itself, front different streets), the name of the street shall also be identified as part of the posted address.

In addition to common requirements specified above, the following additional requirements pertain to each building configuration described below:

- F. Multi-Unit Buildings - Suite/apartment numbers shall be placed on or adjacent to the primary entrance for each suite/apartment and any other door providing access to fire department personnel during an emergency. Multiple residential and commercial units having entrance doors not visible from the street or road shall, in addition, have approved numbers grouped for all units within each structure and positioned to be plainly visible from the street or road.
- G. Multi-Building Clusters - Approved numbers or addresses shall be placed on the front elevation(s) of all buildings that form the cluster. If all building addresses are not clearly visible or legible from the public road serving the structures, an address monument shall also be provided at the entry point(s) to the site indicating the range of addresses accessible from that entrance.

5. Obstructions to Emergency Vehicle Access

Existing or proposed gates and barriers crossing fire apparatus access roadways must be shown on the plans. Information such as the location, type of gate (e.g., swinging, sliding), dimensions, and method of operation (manual, electric) must also be provided. Note or identify the following on the fire master plan:

- A. Clear Width – Gated openings for egress and ingress of vehicles shall have at least 13 feet of clear width when serving a single 13-foot wide fire lane designed for traffic travelling in one direction and 20 feet clear for a 20-foot wide fire lane serving traffic travelling in two directions. The vertical clearance shall not be less than 13 feet 6 inches including landscaping and/or trees. This reduction in width is applicable only to the area immediately adjacent to the guard house or gate. Roads leading up to and beyond the guard house or gate shall meet standard fire lane width requirements prescribed in Section 2.A.5 of this guideline. See Attachment 4. *CFC 503.2.1*

For projects in SRA, gate openings shall be at least 2 feet wider than the width of the traffic lane(s) passing through the gate (minimum 15' for one-way traffic, 22' for two-way traffic). An unobstructed vertical clearance of 15 feet shall be provided. See FSR Section 1273.11 in Guideline B-09a.

- B. Turning Radii - The minimum inside turning radius is 17 feet with an outside radius of 38 feet for both the exterior and the interior approach to the gate. To accommodate the OCFA's largest fire apparatus, 20 feet and 42 feet or larger for inside and outside turning radii, respectively, is recommended and requested where possible. For projects in the SRA, see FSR Sections 1273.04 and 11 in Guideline B-09a. *CFC 503.2.4*

NOTE!

- C. Setbacks from the Street - Gates and barriers shall be located a minimum of 46 feet (for existing developments) and 56 feet (for new developments) from any major street. A private driveway serving only one single-family residence is exempt from this requirement. If existing conditions prevent installation of the minimum setback, documentation supporting an acceptable alternative shall be provided. The alternative solution must facilitate emergency ingress without endangering emergency response personnel, emergency apparatus, and the general public. The alternative shall be subject to review and approval. See Attachment 15. Note: The required minimum setback from the street may also vary from city to city. Check with the local Planning Department for specific requirements as they may be more restrictive.
- D. Setbacks from First Interior Turn - A 27-foot minimum unobstructed setback is required from a gate to the first turn to allow emergency apparatus clearance. See Attachment 15.
- E. Manually Operated Gate and Barrier Design - Typical gate designs may include sliding gates, swinging gates or arms, or guard posts with a chain traversing the opening.
- 1) Permanent or removable bollards are not permitted to be placed across fire access roadways. *CFC 503.4*

- 2) For gates and barriers that are not used on a frequent basis or those that are located such that they have a reasonable likelihood of being blocked by vehicles, vegetation, furniture, or other obstructions (e.g., secondary fire department vehicle ingress/egress points, gates accessed from plazas or turf block areas), permanent signage constructed of 18-gauge steel or equivalent shall be attached on each face of the gate or barrier that reads “FIRE LANE—NO PARKING” or similar. See Attachment 16 for an example of a barrier sign. *503.3*
- 3) Manually operated gates and barriers shall have frangible padlocks, Knox padlocks, or weather-resistant Knox key boxes. The key box shall be placed four to five feet above the roadway surface at the right side of the access gate in a conspicuous location that is readily visible and accessible. The key box must be clearly labeled “FIRE DEPT.” *CFC 506*
- 4) Where the gate will be used for purposes other than emergency vehicle access, installation of a Knox box containing a key to operate an owner-supplied padlock is recommended. If the gate can be reached by emergency personnel from both sides (such as for a secondary emergency access roadway serving a residential tract), the lock shall also be capable of being accessed from both sides. Knox boxes shall be provided as necessary to ensure that the lock can be accessed and opened from any direction of approach available to emergency personnel. For projects in Irvine, see also section 5-9-519.D of the Irvine Uniform Security Code for specific requirements. *CFC 506.1*

F. Electrically Operated Gates and Barriers *CFC 503.6*



- 1) In the event of loss of normal power to the gate operating mechanism, it shall be automatically transferred to a fail-safe mode allowing the gate to be pushed open by a single firefighter *without any other actions, knowledge, or manipulation of the operating mechanism being necessary and without the use of battery back-up power*; this shall be noted on the plan. The manufacturer’s specification sheet demonstrating compliance with this method of operation during power loss shall be provided or scanned directly onto the plan. Should the gate be too large or heavy for a single firefighter to open manually, a secondary source of reliable power by means of an emergency generator or a capacitor with enough reserve to automatically, immediately, and completely open the gate upon loss of primary power shall be provided for fail-open operation. A capacitor, *but not a battery*, may also be used for fail-open operation where the gate operating mechanism does not have a fail-safe mode.
- 2) The gate control for electronic gates shall be operable by a Knox emergency override key switch (with dust cover). The key switch shall be placed between 42” and 48” above the roadway surface at the right side of the access gate within two feet of the edge of the roadway. The key switch shall be readily visible and unobstructed from the fire lane leading to the gate. The key switch shall be clearly labeled “FIRE DEPT.”

To facilitate use by the Irvine Police Department, key switches serving electronic gates in that city shall be located in accordance with the city's security code. Apart from the location (left side of the access road), accessibility, and mounting requirements described therein, they shall otherwise meet all OCFA requirements listed in this guideline.

- 3) For electrically operated gates, the type of remote gate opening device that will be installed shall be noted on the plan. The remote opening device is required in addition to the Knox key switch. The remote opening systems currently available for use by OCFA are either optical or radio-controlled. Optical systems work the same as the traffic signal preemption system by using the emergency vehicle's strobe light to open the gate. The radio-controlled system opens the gate when the emergency responder clicks the receiver on an 800 MHz radio. A gate serving an individual single family residence or duplex is exempt from this requirement.

Currently approved gate opening systems include:

- 3M Opticom
- Click2Enter* (system shall be configured in single-pulse mode with 1.5 second transmission window)
- Fire Strobe Access Products, Inc.
- Tomar

**For projects located in the city of Irvine, Click2Enter shall be used.*

- 4) Upon activation of the key switch, the gate shall open and remain open until returned to normal operation by means of the key switch. Where a gate consists of two leaves, the key switch shall open both simultaneously if operation of a single leaf on the ingress side does not provide for the width, turning radii, or setbacks necessary for fire apparatus to navigate the vehicle entry point. Note this requirement on the plan.
- 5) The key switch shall be labeled with a permanent red sign with not less than ½" contrasting letters reading "FIRE DEPT" or with a "Knox" decal. Note this requirement on the plan.

For projects in the City of Irvine, refer also to Knox and Click2Enter system requirements in the Irvine Uniform Security Code, Section 5-9-519 Emergency Access.

- G. Gate and Barrier Locks - Gate or barrier locks shall be reviewed and approved prior to their installation on any new and/or existing access gate or barrier. Authorization/order forms for Knox products may be obtained through the OCFA Planning and Development Services Section at 714-573-6100; specify whether the order form is for a vehicle/pedestrian gate or a building. Knox key switches and key boxes serving only vehicle gates and not buildings shall be submastered for use by both the fire and police department. See section 9.C.3 for information regarding installation of key boxes and key switches on pedestrian gates and buildings.

6. Requirements for Residential Tract Developments

The following requirements apply to all new residential tract developments with single-family homes or duplexes. They may also be applied to individual single-family homes or duplexes or to multi-family housing projects as approved by the fire code official.

A. Cul-de-sacs.

- 1) Any street that is a required fire lane and greater than 150 feet in length shall be provided with a 38-foot minimum outside turning radius (40 feet for projects located in the SRA—see FSR Sections 1273.05 and 09 in [Guideline B-09a](#)) or other approved turnaround within 150' of the end of the fire lane. See Attachment 17. *CFC 503.2.5*
- 2) The cul-de-sac “bulb” (the portion at the dead-end of the cul-de-sac street which is wider than the cul-de-sac “neck” leading to it—see Attachment 17) shall be identified as a fire lane with red curbs or “Fire Lane—No Parking” signs (see Attachment 13a). Fire lane markings may be omitted from the bulb if one or more of the following applies:
 - a. A three-point turn may be made within 150' of the end of the cul-de-sac with all areas along the curb assumed to be occupied by parked vehicles. Auto-Turn software or other approved methods shall be used to demonstrate this unless a standard hammerhead turnaround template is used. See Attachment 13a; or
 - b. The length of the cul-de-sac street, including any driveway or spur road accessed from the bulb that is a required fire lane, is not more than 150 feet (see Attachment 17). For cul-de-sac streets where all homes are protected with fire sprinklers, the cul-de-sac does not need to be a designated fire lane if the distance to the front door of the most remote home, as measured from entrance to the cul-de-sac street, is no more than 300 feet (see Attachment 20); or
 - c. The radius of the cul-de-sac is at least 46 feet (48 feet in SRA); or
 - d. The cul-de-sac is a public street and local traffic or planning restrictions prohibit the designation of fire lanes in the bulb:
 - i. The homes accessed from the bulb of the cul-de-sac shall be protected with an automatic fire sprinkler system complying with NFPA 13-D. The sprinkler system shall include full protection of the attic space(s).
 - ii. Written concurrence shall be provided from the appropriate city or County development official or engineer indicating that such a prohibition on fire lane signs or red curbs is consistent with local zoning, development, and traffic codes.
- 3) Cul-de-sacs longer than 150 feet that are required to be designated as fire lanes may contain a center island provided that:

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- a. A minimum 28-foot-wide drive lane with an adequate inside turning radius is provided around the island, and
 - b. Island landscaping will not intrude into the drive lane, and
 - c. Any home that uses the portion of the cul-de-sac beyond the beginning of the island to satisfy hose-pull requirements is protected with an automatic fire sprinkler system complying with NFPA 13-D; the sprinkler system shall include full protection of the attic space(s) or another approved method of mitigation.
 - i. Where the radius of the cul-de-sac and size of the island is such that access can be taken only from the portion of the drive lane beyond the beginning of the island (i.e., the road around the island is effectively a curved road and no longer presents the same obstruction to suppression activities as an island cul-de-sac would), attic protection need not be provided when approved by the fire code official.
 - d. The island is designated a no parking area with red curbs or fire lane signs.

See Attachments 18 and 19.

- 5) Cul-de-sac streets that are not required fire lanes as determined by the fire code official are exempt from fire lane identification, turnaround, and other standard requirements; see Attachment 20. Cul-de-sacs, driveways, and other roadways located in the SRA shall comply with the regulations listed in Guideline B-09a regardless of whether they are required fire lanes.

B. Residential eyebrow roads.

- 1) If the “eyebrow” does not meet OCFA’s turning radius and minimum width, fire department access will be measured around the island and any other obstructions from the nearest available fire lane. See Attachment 21.

C. When a detached single-family home or duplex, or related accessory structure (poolhouse, casita, garage, workshop, barn, etc.) on a single-family residential lot, is protected throughout by an approved NFPA 13-D, 13-R, or 13 fire sprinkler system, access distance as measured along an approved route from the fire apparatus to the main entry door serving the interior of the structure may be up to 300 feet. Enhancements to the sprinkler system or project may be required when this distance exceeds 300 feet or when otherwise necessary to mitigate deficiencies in water supply, hydrant location, inaccessible portions of the building’s perimeter, location in a cul-de-sac with an island, etc.

D. Since local law enforcement resources are limited for parking enforcement purposes in private developments, the OCFA requires a viable parking enforcement plan from the developer prior to approving the fire master plan. Parking enforcement plans shall include:

- 1) Detailed information specifically identifying who will be responsible for enforcing the plan, and
- 2) Powers granted to the entity shall include vehicle towing for parking violations (include language similar to that provided in Attachment 8 of this guideline), and
- 3) The level of enforcement to be carried out within the development.

This information must be integrated into the fire master plan. Evidence that the enforcement plan is permanently incorporated into the Conditions, Covenants, and Restrictions (CCRs) and/or recorded against the deed shall be provided prior to OCFA approval of the final map or print of linen. Once approved, these provisions cannot be amended without written approval by the OCFA. See Attachment 22 for a sample enforcement letter.

7. Engineered Alternative Fire Apparatus Access Systems

The following criteria will be used when evaluating an alternative engineered access surface material for a specific application (e.g., “Turf block,” “Grasscrete”). Prior to installation, the design professional must incorporate these criteria into a plan submittal subject to approval by OCFA P&D, which reserves the right to limit the amount or extent of alternative surface serving as required fire department access to a structure or site.

- A. Calculations and a statement stamped and signed by a registered civil engineer or other qualified registered professional shall certify that the proposed surface and substrate meets the criteria of an all-weather driving surface and is capable of withstanding the minimum weight of 68,000 pounds imposed by OCFA apparatus (75,000 pounds for projects located in the SRA—see FSR Section 1273.02 in [Guideline B-09a](#)). Apparatus weight is distributed as 46,000 pounds on tandem rear axles and 22,000 pounds on the front axle. *Note: the OCFA recommends a minimum weight capability of 71,000 pounds in order to support our largest apparatus.*
- B. Manufacturer’s specification of the material being installed must indicate that the application is consistent with the manufacturer’s recommendations.
- C. Material shall only be installed on slopes of no more than one degree (1.75% grade), unless otherwise specified by the manufacturer, and drainage shall be provided as required to provide adequate traction for OCFA apparatus. Surfaces shall be crowned or sloped to one side to drain water away from the roadway; surfaces shall not have a “V” or other configuration causing water to accumulate in the fire access roadway. This information shall be detailed on the plan.
- D. The design shall include a curb cut that delineates entry onto the engineered fire access surface from a street. A 4” or lower curb cut or a rolled/ramped curb is acceptable. The curb cut must be shown on the plan. The entry to the area shall be clearly marked as a fire lane with either a red curb or sign to prevent the entry from being blocked.

- E. A minimum four-inch wide concrete strip around the perimeter of the designated area shall be specified on the plan to clearly delineate the extent of fire department access. If the area is accessible to or intended to be used by anyone other than emergency responders, the concrete curb shall be painted red and stenciled “Fire Lane—No Parking” in white every 30 feet or portion thereof. In areas where painting the curb is not feasible, alternative methods of delineating the extent of the fire access roadway, such as by stamping “Fire Lane—No Parking” into the concrete, posting of signs, or by the use of red reflectors, may be acceptable if approved by OCFA plan review staff. Describe the method of identifying the extent of the fire access roadway clearly on the plan.
- F. The following sentence shall be placed, verbatim, as a note on the plan: “Final approval is subject to actual field acceptance testing utilizing OCFA fire apparatus.”
- G. A clause requiring the maintenance of alternative access roadways shall be placed in the CCRs, deed, and/or similar documents.

8. Hydrant and Water Availability Requirements

Applicants must provide documentation that hydrants are provided in the quantity and spacing described in California Fire Code (CFC) Appendix C. This will prove that they are capable of delivering the amount of water required by CFC Appendix B. The quantity and spacing of hydrants is governed by the fire flow required for the structure(s) served. The required fire flow is dependent upon the size of the structure, type of construction, and whether the building is equipped with fire sprinklers. This information must be shown clearly on the plans to assist in the determination of the fire flow requirement.

- A. Water Availability – To facilitate the review process and avoid untimely delays in project approval, applicants are strongly encouraged to arrange a hydrant flow test with the local water department *prior to submitting plans to the OCFA* if the project includes a new structure or increase in the floor area of an existing structure. Water availability information may not be required to be submitted for every project, and plans may be submitted with a hydrant flow test pending, but the applicant should understand that project approval may be delayed if it is determined during review that this information is required. If the project requires evaluation of the available fire flow, it will not be approved without a completed OCFA Water Availability form or equivalent data sheets from a water district. Water availability information must be no older than six months.



- 1) Obtain a Water Availability form from OCFA Planning & Development Services Section.
- 2) Fill out the project and building information in the first section of the Water Availability form. Care should be taken when determining the applicable fire area for the project. As stated above, fire flow is dependent on several factors, so *the largest building or group of structures is not necessarily the most demanding* in terms of fire flow.

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- 3) Determine the required fire flow from CFC Table B105.1, provided in Attachment 23. A 50% reduction in fire flow (but not duration) may be taken when the fire-flow calculation area consists only of buildings equipped with an approved automatic fire sprinkler system. If you are unsure of how to calculate the fire flow requirement for your project, you may fax the form to the OCFA and we will determine the fire flow for you.
 - 4) Contact the local water company to request a hydrant flow test or fire flow modeling calculation, and have a representative of the water company complete and sign the last section on the form. In some cases, the water company may allow or require a qualified third party to perform the flow test for you.
 - a) In newly developed areas without water infrastructure, the water department may issue a “will-serve” letter indicating the expected amount of water that will be delivered once the water system is installed and operational.
 - b) If multiple hydrants are located within the maximum distance allowed by CFC Table C105.1, the amount of water available from each hydrant may be combined, provided that the hydrants are flowed simultaneously.
 - c) It is the applicant’s responsibility to ensure that the following information is provided at a minimum on either the water company’s test data sheet and/or the OCFA Water Availability form:
 - (a) Static pressure and residual pressure in psi and observed flow in gpm; or
 - (b) Calculated flow in gpm at 20 psi.
 - d) Scan or photocopy the completed form or data sheets onto your plans or include the original with your plan submittal.
 - 5) Please ensure that the fire area, building size, construction type, and flow data are complete and accurate. Errors or omissions in this information may result in plans having to be resubmitted or fire flow testing being redone.
- B. Fire-Flow Calculation Area – The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3. Portions of buildings which are separated by fire walls without openings, constructed in accordance with the California Building Code are allowed to be considered as separate fire-flow calculation areas. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors. *CFC Appendix B Section B104*
- C. Hydrant Location – Hydrants shall be provided along the length of the fire access roadway in the quantities and up to the maximum distances prescribed in CFC Table C-105.1. See Attachments 24 and 29.

- 1) Hydrants must be located no more than three feet from the edge of a fire access roadway and cannot be located in areas where they will be visually or operationally obstructed (behind fences or walls, in bushes, behind parking spaces, etc.). Clearance shall be provided to a distance no less than three feet from the perimeter of the hydrant. Where hydrants are located in landscaped areas, a 4x4' concrete pad may be required by the OCFA inspector to ensure that vegetation does not encroach on this clear space. For projects in the SRA, please see FSR Section 1275.15 in Guideline B-09a.
- 2) The hydrant outlets must face the fire access roadway. Where all of the outlets cannot face the fire access roadway (e.g., the hydrant is located in a landscape peninsula or island in a parking lot; the hydrant has three outlets), the 4" outlet(s) shall take precedence.
- 3) The hydrant shall be located at least 40 feet from the building(s) it serves (50 feet for structures in the SRA per FSR Section 1275.15 in Guideline B-09a). Where it is impractical to locate the hydrant 40 feet from adjacent structures, additional hydrants may be provided or the hydrant may be located closer provided that nearby walls do not contain openings and the hydrant is not otherwise located where it can be rendered inoperable due to damage from collapsed walls, debris, or excessive heat.
- 4) Hydrants shall be located so that a hose line running between the hydrant and the fire department connection(s) (FDCs) served by that hydrant does not cross driveways, obstruct roads or fire lanes, or otherwise interfere with emergency vehicle response and evacuation of a site.
- 5) Hydrants and fire department connections shall not be located behind parking stalls or in other locations where they are likely to be blocked by vehicles or other objects. Whenever possible, hydrants shall be placed at street and drive aisle intersections in preference to mid-block locations. Where on-street parking is allowed, hydrants should be placed in the shortest parkways between adjacent driveways, at corners and chokers where parking is not normally allowed, and in similar areas where impact to space available for parking and the potential for hydrants to be obstructed is minimized. Where adherence to the spacing requirements of CFC Table C-105.1 does not permit hydrant locations to be optimized in this manner, the fire code official may authorize alternative spacing.
- 6) Hydrants and fire department connections should not be located where apparatus staged at these appurtenances would then encroach on minimum fire apparatus turning radii unless alternative routes are available. Hydrants shall not be placed in the "bulb" end of a cul-de-sac where apparatus staged at the hydrant would prevent the cul-de-sac from being used as a turnaround. For projects located in the SRA, see FSR Section 1275.15 in Guideline B-09a.



D. Protection of Hydrants – Where hydrants are located such that they are exposed to potential damage from vehicular collision, they shall be protected by curbs or bollards. See Attachment 25.

- 1) If vehicles can approach the hydrant from more than one direction, the hydrant shall be protected by four bollards of concrete-filled pipe four inches in diameter and mounted in concrete in a square around the hydrant. The bollards need to be spaced a minimum of three feet from the perimeter of the hydrant. The bollards must be placed so that their location does not impede access to or use of the hydrant. Two bollards may protect hydrants that can be approached from only one side.
- 2) Hydrants may not require protection by bollards if they are located such that the potential for collision is minimal or if they are sufficiently protected by a standard concrete curb at least six inches in height.

E. Hydrant Markers and Color –

1. Blue reflective pavement markers (“blue dots”) shall be used to identify fire hydrant locations. Blue reflective markers used for any other purpose should be removed. See Attachment 26. Projects in the SRA shall also comply with FSR Section 1275.20 in Guideline B-09a.
 - a) Two-way streets and roads – Markers shall be placed six inches from the edge of the painted centerline or from the approximate center of streets without a painted centerline on the side nearest the hydrant.
 - b) Streets with left turn lanes at the intersection – Markers shall be placed six inches from the edge of the painted white line on the side nearest the hydrant.
 - c) Streets with continuous two-way left turn lane – Markers shall be placed six inches from the edge of the painted yellow line on the side nearest the fire hydrant.
 - d) Freeways – Because of higher maintenance at these locations, markers shall be placed on the shoulder of the roadway one foot to the right of the painted edge line nearest the hydrant.
2. Hydrant Color
 - a) Private hydrants (hydrants separated from the city main by and located downstream from a backflow prevention device) shall be painted OSHA safety red or equivalent. A plan for underground piping serving private hydrants shall be submitted to the OCFA for review and approval.
 - b) Public hydrants shall be painted any color other than red as specified by the local water purveyor or city/County water department.

9. Access to Structures

- A. Hose pull – The dimension of 150 feet when used in relation to fire department access is commonly referred to as “hose pull distance.” As the name implies, this is the maximum distance that firefighters can effectively pull a fire hose or carry other equipment to combat a fire. The hose pull distance is set at 150 feet due to a variety of factors, including standard hose lengths, weight of equipment, hydraulic properties, and accepted operational procedures. See Attachments 27 and 29.



NOTE!

- 1) Hose pull is measured along a path that simulates the route a firefighter may take to access all portions of the exterior of a structure from the nearest public road or fire lane. Under most circumstances, hose pull will not be a straight-line distance and should *not* be measured “as the crow flies.”
- 2) All obstructions such as fences, planters, vegetation, and other structures must be considered when determining whether a building is accessible from a particular location on the fire access roadway. Topography may also affect the potential access route and any significant changes in elevation must be accounted for when measuring hose pull distances.



NOTE!

- 3) Hose pull measurements begin at a point in the street located 10 feet from the edge of the curb.

- B. Access walkways - CFC 504.1 specifies the installation of approved access walkways from fire access roadways to exterior openings required by either the CBC or CFC. The OCFA may require the construction of such walkways depending upon particular site conditions or project parameters. These conditions include, but are not limited to, building use or occupancy, topography, vegetation, and surface conditions. Design professionals must carefully consider these issues when developing a project site.

- 1) Access walkways must be provided to all required egress doors from a building, all firefighter access doorways in buildings with high-piled storage, and the area beneath each rescue window, at a minimum. Access walkways will typically be required around the entire perimeter of a structure to facilitate control of a fire through any other available openings.
- 2) Access walkways must be a minimum of five feet in width.



NOTE!

- 3) Access walkways shall consist of a surface that lends itself to safe use during building evacuation, firefighting, and rescue efforts. Solid surface walkways such as concrete or asphalt are preferable, though alternative surfaces such as decomposed granite (DG), gravel, or grass are permissible under certain conditions. Ground covers and shrubs that prevent or impede laddering of structures are not permitted to be planted on or adjacent to access walkways.

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- 4) Where the grade itself presents a slip or fall hazard, an access walkway with a slip-resistant surface and/or stairway must be provided.
 - 5) The type of material provided for the access walkway and/or other specifications shall be indicated on the fire master plan and are subject to approval by the OCFA.
- C. Path of travel obstructions - Firefighter access to and emergency egress from required openings must remain free and unobstructed at all times. Architects, landscape designers, and facility managers must take care to ensure that fences, planters, and vegetation will not interfere with access and egress routes.
- 1) Fences - Walls, fences, hedges, and similar obstructions may not be located within the area designated as an access walkway unless a gate through the obstruction equipped with an approved padlock or Knox box has been provided for firefighters to access the perimeter of the structure. If the wall or fence blocks travel from required egress openings to the public way or an open area at least 50 feet from the structure ("safe dispersal area" per CBC 1027.5), a gate operable by the occupants evacuating the structure must be provided that allows unimpeded egress to the public way. Where doors in the path of emergency egress travel are required to be equipped with panic hardware, gates shall likewise be similarly equipped. These requirements may not apply to individual single family residences.
 - 2) Vegetation - As stated previously, certain types of ground cover and low-growing plants present an impediment to firefighting and rescue operations and are prohibited from being planted in the access walkway. In addition, taller vegetation such as shrubs and trees may not be located where they will, either when planted or upon maturation, present an obstruction to accessing rescue windows. Raised planter areas are not allowed to be used as rescue ladder access points where the change in elevation could be a potential impediment to firefighter access.
 - 3) Key boxes and key switches - Knox devices shall be provided where necessary to ensure that immediate access for firefighting, rescue, and other emergency purposes is possible.
 - a) Location - At a minimum, Knox devices shall be provided for the following locations:
 - gates along the paths of firefighter travel from the fire lane to all points along the perimeter of the structure;
 - gates to pool enclosures;
 - building gates or doors leading to interior courtyards containing rescue windows;
 - building gates or doors leading to exterior hallways or balconies providing access to residential units or tenant suites;
 - gates in exterior enclosures containing hazardous or combustible material storage;

- buildings using hazardous materials or processes where such warrants immediate access
- exterior doors to rooms containing main alarm panels or annunciators;
- doors and gates providing access to parking structures;
- within the fire command center in high-rises and other large buildings;
- main entry to buildings equipped throughout with an alarm system and not staffed 24/7;
- facilities where a high-volume of after-hours calls is expected or experienced;
- doors and gates to other areas identified by the fire department.

When approved by the OCFA, a frangible padlock or chain that can be cut with bolt cutters or a Knox padlock may be used in lieu of a key box for exterior hazardous or combustible materials storage areas. Manually operated vehicle or pedestrian access gates that are not commonly used or not required to be openable from the egress side may also be provided with a frangible padlock or chain.

Knox boxes or switches shall be located adjacent to and clearly visible from the gate or door served. For gates in walls and fences up to six feet in height, they shall be securely mounted at a height of four to five feet above grade; on buildings they shall be mounted six feet above grade, in a location that is easily accessible to firefighters and, when required, police officers. Shared Knox devices (see section 9.C.3.e below) shall meet the installation requirements of both the OCFA and the police department unless otherwise approved by the applicable agency—refer to the local security or municipal ordinance for specific requirements. Where the potential for vandalism or tampering is significant, key boxes that are not submastered for police department use may be mounted higher with OCFA approval. Boxes and switches are not required to be electronically monitored; if they are, they shall not initiate an alarm signal that requires a response by the fire department.

- b) Key box Contents - The key used to unlock the gate or door shall be kept in the key box. When the key unlocks more than the individual adjacent gate or door, a label or tag shall be attached to the key identifying the gates or doors it operates. Where multiple gates or doors are served by a single box, two or more copies of the key(s) are recommended so that a copy will be available to each engine company responding to the site.
- c) Electric Locks – Electromagnetically or electromechanically locked pedestrian gates and doors shall be equipped either with a Knox box containing a key to open the lock or, if the door lock cannot be operated with a key from the exterior, a Knox key switch shall be provided adjacent to the door. Where key switches are provided, the door or gate lock shall remain disengaged until the key switch is returned to the “normal” closed or locked position. In the city of Irvine, a Knox box and key operated lock may be required for electromagnetically or electromechanically locked gates and doors serving common areas; Click2Enter

may also be required. Please refer to Irvine Uniform Security Code, Section 5-9-519.

- d) Vehicle gates - See sections 5.E through 5.G for more information on requirements for Knox boxes and key switches serving vehicle gates across fire lanes.
- e) Master and Submaster Keying - Knox devices that provide access only to the perimeter of buildings and exterior common areas shall be submastered for dual use by the fire and police departments. Where access to interior *common* areas of buildings is mandated by the local security or municipal code, Knox devices shall also be submastered. Knox boxes containing keys to access any interior *private* spaces, such as the interior of single tenant buildings or individual suites in a multi-tenant building, shall be mastered for use by the fire department only. Where the local code requires police department access to these private interior portions of the building, a Knox box with dual master cylinders (one usable by the police, the other by the fire department), a separate device for each agency, or other arrangement may be required—contact OCFA P&D if this condition applies to your project. Where additional devices beyond those required by the fire department are called for in the local municipal or security code, they shall also be accessible for use by the fire department to facilitate emergency response.

See Attachment 28 for a list of conditions where police department access to the interior of structures is required by each jurisdiction. If a Knox device serving any portion of the interior of a building will be submastered, indicate this on the fire master plan and provide documentation from the police department specifically stating that such access is required, including the acceptable installation specifications, on the plan.

- f) Ordering Knox Devices - Contact the Fire Prevention department to request Knox order forms, either in person, by email at publiccounter@ocfa.org, or by phone: 714-573-6100. When requesting the form, specify whether you need to order devices for vehicle/pedestrian gates or building access. When completing the order form, remember to mark on the form whether your device needs to be submastered for police department use. The service request number of an approved fire master plan and/or architectural plan, as appropriate, will be required to obtain an authorization signature on the Knox order form.

- D. Access to interior courtyards - Firefighter access and water supply as described below shall be provided for interior courtyards of R occupancy buildings. These requirements shall also apply to courtyards of buildings of other occupancies where the main entry door to any suite is accessed via the courtyard instead of an interior corridor or an egress balcony or door on the outer façade of the building. These are minimum requirements; structures that present unique or increased hazards to fire department operations may be subject to additional requirements. Covered courtyards designed as an atrium per CBC 404 are exempt from these requirements.

1) Number of access routes

- a) A minimum of two means of access via “firefighter tunnels” shall be provided between each courtyard and the fire lane. A single tunnel may be allowed for smaller courtyards, as determined by the fire code official.
- b) A tunnel interconnecting courtyards may suffice as a second means of access, provided that each courtyard so connected has at least one other tunnel leading directly to a fire lane.

2) Design of firefighter tunnels

- a) The outer entrance to the tunnel shall front on a fire lane.
- b) Tunnels shall be a minimum 10 feet wide and, where possible based on the height of the story they pass through, at least 10 feet tall, but no less than 8 feet.
- c) Doorways and gate openings in the path of firefighter travel to, through, and from the tunnel shall provide a minimum 44-inch clear width after accounting for door jambs, door hardware, and other obstructions.
- d) Where the tunnel intersects with corridors or other interior spaces, doors shall be provided to completely separate the tunnel from those spaces in a manner that provides an uninterrupted path of travel through the tunnel from one end to the other.
- e) Every courtyard shall have at least one tunnel that provides a straight path of travel between the fire lane and the courtyard. Slight offsets are allowed provided that the dimensions and configuration of the path and location of doors, gates, stairs, and other features facilitate passage of firefighters carrying a 35’ ladder. Other tunnels shall provide the shortest route feasible between the fire lane and courtyard but, when permitted by the fire code official, may not be required to accommodate movement of a ladder.
- f) Landscape and hardscape features such as trees, shrubs, light poles, raised planters, walls, fences, and gates near the openings to the tunnel shall not hinder or delay movement of firefighters carrying a ladder.
- g) Where there is an elevation change between the fire lane and courtyard, code-compliant ramps or stairs with a minimum clear width of 44” between handrails shall be provided. Only straight-run stairs shall be provided; no stair returns are allowed along the path of firefighter travel.

3) Tunnel construction

- a) Tunnels shall be separated from adjacent construction by minimum 2-hour fire barriers and 2-hour ceiling/floor assemblies.
 - b) Interior doors opening into the tunnel shall be minimum 90-minute rated self- or automatic-closing assemblies. Doors may be equipped with mag-holds, but other door stops are not allowed.
 - c) Wall and ceiling finishes within the tunnel shall be non-combustible. Where allowed by CBC/CFC Chapter 8, floors may be carpeted.
- 4) Use of firefighter tunnels - Tunnels are permitted to be used for other purposes provided that the use does not obstruct the clear path required or otherwise interfere with use of the tunnel for emergency purposes. Combustible furnishings and fixtures within the tunnel shall be kept to a minimum, and such items shall be fixed in place. Where the tunnel is also an exit component of the egress system (e.g., exit enclosure, passageway, exit stair, horizontal exit) or functions as an egress court per CBC 1027.4, no other non-emergency use shall be allowed within the tunnel.

5) Standpipes

- a) At least one standpipe outlet shall be provided in the courtyard when hose-pull from fire apparatus in the fire lane to any portion of the inner façade within the courtyard exceeds 200’.
- b) If standpipes are required, an outlet shall be provided at the opening of the firefighter tunnel(s) into the courtyard and at other approved locations as required by the fire code official so that hose-pull to all portions of the courtyard is less than 150’ as measured from the fire apparatus or standpipe outlet.
- c) The standpipe shall be Class I, interconnected to the sprinkler or underground system, and able to be pressurized via a fire department connection, if not automatically pressurized to a minimum of 100 psi via a fire pump serving the sprinkler system.
- d) The standpipe may be wall mounted or standalone. If standalone, it shall be located no more than 18” from the edge of a primary walkway in the courtyard in a position where it is immediately visible and accessible to firefighters. Access to and use of standpipes shall not be hindered by planter walls, vegetation, or other features; 18” clearance shall be provided on all sides. The standpipe shall be provided with a permanent, durable sign stating “WET AUTO STANDPIPE” or “WET MANUAL STANDPIPE” as applicable in a color that contrasts with the background, preferably red on white or vice versa.

- 6) Rescue windows - In R occupancy structures requiring rescue openings, trees, shrubs, cabanas, trellises, fences, walls, pools, and other features shall not impede laddering operations. A clear space for raising and setting a ladder shall be provided beneath each rescue opening, and a walkable path free of obstructions shall be provided between each laddering area and the firefighter tunnel.

10. Access during construction

Access and water supply during construction shall comply with CFC Chapter 33 and the provisions listed in this section and, where applicable, elsewhere in this guideline. Construction activities at job sites not complying with these requirements may be suspended at the discretion of the OCFA inspector until a reasonable level of compliance is achieved.

At no time shall construction projects impair or obstruct existing fire access roadways or access to and operation of existing fire hydrants serving other structures. Should existing roadways or hydrants need to be moved or otherwise altered during the course of construction, the developer shall provide alternative access routes and other mitigation features to ensure adequate fire and life-safety protection. Such alternatives and features shall be submitted to the OCFA for review and approval prior to alteration of existing conditions.

NOTE!

A. Lumber drop inspection – an inspection shall be scheduled with an OCFA inspector to verify that access roadways and operable hydrants have been provided for buildings under construction.

- 1) For buildings of Type IV and V construction (and non-combustible structures that may have a portion of the exterior walls, façade, or other building elements comprised of wood or other combustible material), a lumber drop inspection shall occur prior to bringing combustible building materials on site.
- 2) For other construction types (Type I, II, III) with exterior walls built of non-combustible materials, an inspection shall occur prior to commencing interior construction involving combustible materials (e.g., wooden mezzanines or partition walls, carpet, cabinetry or other woodwork, furniture, etc.). In concrete tilt-up and masonry buildings, wooden panelized roofing systems are exempt from this requirement.
- 3) An inspection shall occur prior to construction reaching 40 feet in height for buildings of any construction type that will have four or more floors when complete.
- 4) The street address of the site shall be prominently posted at each entrance. For projects on streets that do not have a name or street signs posted yet, the sign shall include the project name and tract/lot number.
- 5) Gates through construction fencing shall be equipped with a Knox padlock or frangible lock/chain. The local jurisdiction may also have specific construction site

security requirements that may be more stringent (e.g., Irvine’s Construction Site Security Ordinance). Where more stringent local requirements apply, provision shall be made to ensure that firefighters can open the gate with bolt-cutters..

- 6) When required by the OCFA inspector, fire lanes shall be posted with “Fire Lane—No Parking” signs or no parking areas shall be otherwise identified to maintain them free of obstructions during construction.
- 7) Provisions shall be made to ensure that hydrants are not blocked by vehicles or obstructed by construction material or debris. A three-foot clear space shall be provided around the perimeter of the hydrant and no parking or similar obstructions shall be allowed along the adjacent road within 15 feet of the hydrant. Inoperable hydrants shall be bagged.

B. Temporary Fire Access Roads - Temporary access roads (construction roads that do not match the final location and configuration of permanent roads as approved on a Fire Master Plan) and temporary hydrants may be permitted for single family residential model construction or a single detached custom home less than 5500 square feet in area with the conditions listed below. They may be allowed on a case-by-case basis for other structures with additional requirements, as determined by the fire code official.

- 1) Plans for temporary access shall be submitted to the OCFA Planning and Development Services Section. Plans shall be drawn to scale and show permanent (existing) roadways, proposed temporary roadway locations, location of models, space dedicated to storage of construction materials, and parking for work crews and construction vehicles. The plans shall clearly state that they have been submitted for temporary access and hydrants.
- 2) Plans shall be stamped and signed by a licensed civil engineer stating that the temporary access road can support 68,000 pounds of vehicle weight in all-weather conditions. The road base material shall be over soil compacted to at least 90% and be mixed or topped with a suitable binding material to provide all-weather characteristics; road base alone does not satisfy this requirement. Provide manufacturer’s documentation that demonstrates suitability of the material specifically as a *road stabilizer* as opposed to a dust palliative or for hillside erosion control, and, if applicable, indicating the mixture ratio for this purpose.
- 3) Provide a parking plan for the construction site detailing how the fire lane no parking regulations will be enforced. Include a clause in the letter stating that “the job-site superintendent is responsible for informing the work crews of parking requirements and that the entire job-site is subject to shutdown by the OCFA inspector if parking is in violation of fire lane posting.” The letter shall be written on company letterhead and scanned onto the plan.
- 4) Aboveground invasion lines are acceptable for water supply.

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- a) Provide drawings detailing how the line will be secured in place (e.g., size, depth, and interval of rebar tie-downs) and protected from vehicular damage (e.g., K-rails or bollards).
 - b) An invasion line may be run underground if the depth of bury can support the 68,000-pound weight of a fire apparatus (75,000 pounds for projects located in the SRA—see FSR Section 1273.02 in Guideline B-09a).
 - c) The temporary water line must provide the required fire flow; calculations may be required.
 - d) The pipe shall be listed for fire service.
 - e) Fire hydrants shall consist of a minimum 6” barrel with one 2-1/2” outlet and a 4” outlet. Note this on the plan.
- 5) All other access and water requirements shall apply (e.g., width, approach clearance, premises identification, locks, gates, barriers, etc.).
 - 6) The approved plan for temporary access and water supply shall be available at the construction site prior to bringing combustible building materials on-site.
 - 7) An inspection by OCFA personnel is required to verify adherence to the approved plan prior to bringing combustible materials on-site.
- C. Phased access - Incremental installation of permanent access roadways as shown on a fire master plan may be permissible for commercial and residential developments. If phased installation is anticipated, the site superintendent or designee shall review the installation process with an OCFA inspector during the lumber drop inspection or pre-construction meeting. Depending on the complexity of the installation, size of the project, and other project-specific factors, the inspector may allow phased installation to proceed immediately or may first require that all or some of the following items are satisfied:
- 1) Plans for phased access shall be submitted to the OCFA Planning and Development Services Section either as part of the original fire master plan submittal or as a revision to an approved fire master plan. Plans shall be drawn to scale and demonstrate that all access and water requirements are met during all phases of construction and that approval of one phase does not compromise or complicate completion of the subsequent phases. Plans shall show for each phase of construction:
 - the extent of building construction
 - location of operable hydrants serving all buildings under construction
 - the location of construction fencing, barriers, and vehicle access gates
 - the location of all temporary or permanent “Fire Lane—No Parking” signs
 - equipment/materiel staging locations
 - worker parking areas (see item “4” below)

- 2) Phasing plans shall be stamped and signed by a licensed civil engineer stating that the access road can support 68,000 pounds of vehicle weight in all-weather conditions apparatus (75,000 pounds for projects located in the SRA—see FSR Section 1273.02 in Guideline B-09a). The road base material shall be over soil compacted to at least 90% and be mixed or topped with a suitable binding material to provide all-weather characteristics; road base alone does not satisfy this requirement. The final road section less the final lift of asphalt topping may be acceptable if certified by the engineer.
- 3) The phasing plan shall identify any anticipated areas where fire department access roadways may be temporarily inaccessible due to trenching, slurry coating, striping, or other construction activities after they have been installed and inspected. The plan shall indicate the anticipated period of impairment and include provisions for providing plating over trenches and alternative access routes, notification to the fire department, and/or other forms of mitigation when such roadways are impaired.
- 4) Provide a parking plan for the construction site detailing how the fire lane no parking regulations will be enforced. Include a clause stating that “the job-site superintendent is responsible for informing the work crews of parking requirements and that the entire job-site is subject to shutdown by the OCFA inspector if parking is in violation of fire lane posting.”
- 5) The approved phasing plan shall be available at the construction site prior to bringing combustible building materials on-site. A lumber drop inspection by an OCFA inspector will be required prior to the commencement of each phase; additional inspection fees will be due for each phase.
- 6) All other access and water requirements shall apply (e.g., width, approach clearance, premises identification, locks, gates, barriers, etc.).

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ATTACHMENT 1

OCFA Fire Master Plan Notes

All of the notes listed in the INSPECTION REQUIREMENTS and GENERAL REQUIREMENTS sections shall be placed, verbatim, on the plan under the heading "FIRE AUTHORITY NOTES." Include individual notes, as applicable, from the PROJECT-SPECIFIC REQUIREMENTS section.

INSPECTION REQUIREMENTS

1. OCFA site inspections are required for this project. Please schedule all field inspections at least 48 hours in advance. Inspections canceled after 1 p.m. on the day before the scheduled date will be subject to a re-inspection fee. Call OCFA Inspection Scheduling at (714) 573-6150.
2. A lumber drop inspection shall be performed prior to bringing combustible materials (or combustible fixtures and finishes for structures of non-combustible construction). All-weather access roads capable of supporting 68,000 lbs., topped with asphalt, concrete, or equivalent shall be in place and hydrants operational at time of lumber drop inspection.
3. For projects with fuel modification, a vegetation clearance inspection is required prior to a lumber drop inspection. Use the fuel modification plan service request number to schedule the vegetation clearance inspection.
4. Phased installation of fire access roads requires additional inspections not covered by the fees paid at plan submittal. Contact Inspection Scheduling to arrange for additional inspections that may be needed and any fees that may be due.
5. An original approved, signed, wet-stamped OCFA fire master plan shall be available on-site at time of inspection.
6. Access roads and hydrants shall be maintained and remain clear of obstructions at all times during and after construction. Areas where parking is not permitted shall be clearly identified at all times. Obstruction of fire lanes and hydrants may result in cancellation or suspension of inspections.
7. Temporary fuel tanks of 60 or more gallons shall be reviewed, inspected, and permitted by the OCFA prior to use.
8. The project address shall be clearly posted and visible from the public road during construction.
9. All gates in construction fencing shall be equipped with either a Knox or breakaway padlock.
10. Buildings of four or more stories shall be provided with stairs and a standpipe before reaching 40 feet in height.

GENERAL REQUIREMENTS

11. Fire lane widths shall be measured from top face of the curb to top face of the curb for fire lanes with standard curbs and gutters and from flow-line to flow-line for fire lanes with modified curb designs (e.g., rolled, ramped, etc). The developer is responsible to verify that all approved public works or grading department street improvement plans or precise grading plans conform to the minimum street width measurements per the approved OCFA fire master plan and standards identified in OCFA Guideline B-09 for all portions of the fire access roads.
12. Permanent, temporary, and phased emergency access roads shall be designed and maintained to support an imposed load of 68,000 lbs. and surfaced to provide all-weather driving capabilities.
13. Fire lane signs and red curbs shall meet the specifications shown in OCFA Guideline B-09 and shall be installed as described therein. Additional fire lane markings may be required at the time of inspection depending on field conditions.
14. All fire hydrants shall have a "Blue Reflective Pavement Marker" indicating their location per the OCFA standard. On private property markers are to be maintained in good condition by the property owner.
15. Address numbers shall be located and be of a color and size so as to be plainly visible and legible from the roadway from which the building is addressed in accordance with OCFA Guideline B-09. Wayfinding signs, when required by the local AHJ, shall comply with the standards of that agency. When wayfinding signs are also required by the OCFA, they may be designed to local AHJ requirements provided that such standards facilitate location of structures, suites, and dwelling units by emergency personnel.

16. Access gates shall be approved prior to installation and shall be in compliance with Chapter 5 of the CFC and OCFA guidelines.
17. Approved access walkways shall be provided to all required openings and all rescue windows.
18. Vegetation shall be selected and maintained in such a manner as to allow immediate access to all hydrants, valves, fire department connections, pull stations, extinguishers, sprinkler risers, alarm control panels, rescue windows, and other devices or areas used for firefighting purposes. Vegetation or building features shall not obstruct address numbers or inhibit the functioning of alarm bells, horns, or strobes.
19. Dumpsters and trash containers larger than 1.5 cubic yards shall not be stored in buildings or placed within 5 feet of combustible walls, openings or combustible roof eave lines unless protected by an approved sprinkler system.
20. Any future modification to the approved Fire Master Plan or approved site plan, including but not limited to road width, grade, speed humps, turning radii, gates or other obstructions, shall require review, inspection, and approval by the OCFA.
21. Approval of this plan shall not be construed as approval of any information or project conditions other than those items and requirements identified in OCFA Guideline B-09 and related portions of the 2013 CFC and CBC. This project may be subject to additional requirements not stated herein upon examination of actual site and project conditions or disclosure of additional information.

PROJECT-SPECIFIC REQUIREMENTS (Include only those notes that are applicable to the project as designed; some notes may need to be modified to address specific project conditions)

22. An underground piping plan is required for the installation of an automatic fire sprinkler system or for a private fire hydrant system. A separate plan submittal is required.
23. An architectural plan is required to be submitted to the OCFA for review and approval for projects containing A, C, E, F, H, I, L, and R-4 occupancies. A plan may also be required for R-1 and R-2 occupancies over two stories or those utilizing sprinklers or fire walls to increase the maximum building size allowed—see OCFA Info Bulletin 02-13.
24. A chemical classification and hazardous materials compliance plan shall be approved by the OCFA prior to any hazardous materials being stored or used on site. A separate plan submittal is required.
25. Buildings used for high-piled storage shall comply with CFC requirements. A separate plan submittal is required if materials will be stored higher than 12 feet for lower-hazard commodities, or higher than six feet for high-hazard commodities such as plastics, rubber, flammable/combustible liquids, tires, carpet, etc.
26. An automatic fire sprinkler system shall be installed in accordance with applicable codes and local ordinances, amendments, and guidelines. Sprinkler systems, other than those listed in CFC 903.4, shall be monitored by an approved central station. Separate plan submittals for the sprinkler and monitoring systems are required.
27. Buildings containing industrial refrigeration systems shall comply with CFC requirements. A separate plan submittal is required if refrigerant quantities exceed thresholds.
28. A fire alarm system shall be installed in accordance with applicable codes and local ordinances, amendments, and guidelines. A separate plan submittal is required.
29. Structures located in a Fire Hazard Severity Zone or Wildland-Urban Interface area are subject to the construction requirements prescribed in Chapter 7A of the 2013 CBC and/or Section 327 of the 2013 CRC. Construction materials/methods are reviewed and inspected by the Building Department.
30. One or more structures shown on this plan are located adjacent to a fuel modification area. Changes to the fuel modification zone landscaping, new structures, or addition/alteration to existing structures requires review and approval by the OCFA.
31. Projects located in State Responsibility Areas shall also comply with all applicable requirements from Title 14, Div. 1.5, Ch. 7, SubCh. 2 “SRA Fire Safe Regulations” and Guideline B-09a.

ATTACHMENT 2

Fire Master Plan Submittal Checklist

PROJECT INFORMATION

- | | | |
|---|------------------------------|--|
| Scope of project is clearly defined on the plan? | <input type="checkbox"/> Yes | |
| Conditional Use Permit conditions included with submittal? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (CUP was not required by city/county) |
| Tract/Tentative Tract/Parcel Map Number has been provided? | <input type="checkbox"/> Yes | |
| Standard OCFA fire master plan notes are included? | <input type="checkbox"/> Yes | (Notes are tailored to this project, where applicable) |
| Building area, construction, occupancy, sprinklers noted on plan? | <input type="checkbox"/> Yes | |
| Allowable area calculation provided on plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Building less than 6,000/18,000 sq.ft.) |
| AM&M request letter scanned onto plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No alternate methods proposed) |
| Sheets not relevant to fire master plan removed from plan set? | <input type="checkbox"/> Yes | |
| Access/hydrant phasing plan provided? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No phasing of access/hydrant installation) |
| Operations incident planning CD/electronic file provided? | <input type="checkbox"/> Yes | <input type="checkbox"/> No (Will provide prior to plan approval) |

WATER AND HYDRANTS

- | | | |
|---|------------------------------|--|
| Water availability form completed and provided? | <input type="checkbox"/> Yes | <input type="checkbox"/> No (In process; or no change in demand) |
| All hydrants within 400' of the site are shown on plan? | <input type="checkbox"/> Yes | |
| Are hydrants provided/spaced per CFC Appendix C? | <input type="checkbox"/> Yes | |

ACCESS AND ROADWAYS

- | | | |
|--|------------------------------|---|
| Extent of the access roadway is clearly shown on the plan? | <input type="checkbox"/> Yes | |
| Turning radii and width (incl. road sections) shown on the plan? | <input type="checkbox"/> Yes | |
| Exterior of all structures within 150' hose pull distance? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (AM&M proposed or sprinklered R-3) |
| Engineer's certification provided for new paving? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No new paving) |
| Walkable surface provided to required openings? | <input type="checkbox"/> Yes | |
| Road and walkway grades >10% (7% in Irvine) shown on plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Grade <10%, <7% in Irvine) |

FIRE LANE IDENTIFICATION

- | | | |
|---|------------------------------|---|
| Red curbs are identified with bold or dashed lines? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Signs provided) |
| Location of each "Fire Lane—No Parking" sign shown? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Red curbs provided) |
| Fire lane entrance sign provided at each vehicle entrance? | <input type="checkbox"/> Yes | |
| Detail drawings of red curbs/"No Parking"/entrance signs shown? | <input type="checkbox"/> Yes | |

GATES AND OBSTRUCTIONS

- | | | |
|---|------------------------------|--|
| Are all gates, fences, and planters shown? | <input type="checkbox"/> Yes | |
| Are vehicle gates identified as manual or electric? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No gates) |
| Manual vehicle gates have "No Parking" sign noted? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No manual gates) |
| Knox boxes/locks/switches are noted on plans? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No gates) |
| OCFA gate notes/specifications included on plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No gates) |
| Knox form completed? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No gates) |

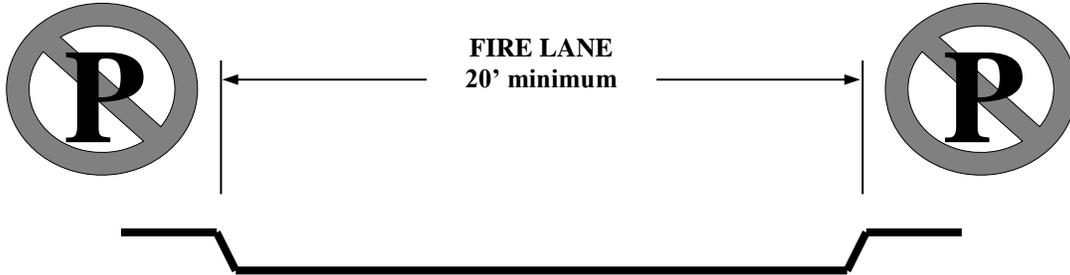
OTHER REQUIREMENTS

- | | | |
|--|------------------------------|--|
| Premises ID/address monument location shown on plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Single family homes) |
| Trash enclosures are located at least 5' from buildings? | <input type="checkbox"/> Yes | <input type="checkbox"/> No (Enclosures are sprinklered) |
| Two entry points provided for 150 or more residences? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Non-residential project) |
| Buildings >55' to highest occupiable floor called out? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (No high-rise structures) |
| Parking enforcement letter provided? | <input type="checkbox"/> Yes | <input type="checkbox"/> N/A (Public streets only) |
| Project located in DOGGR area (portions of Yorba Linda, Placentia, Buena Park, Seal Beach, San Clemente, and Unincorporated County) or near a landfill (see C-03)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

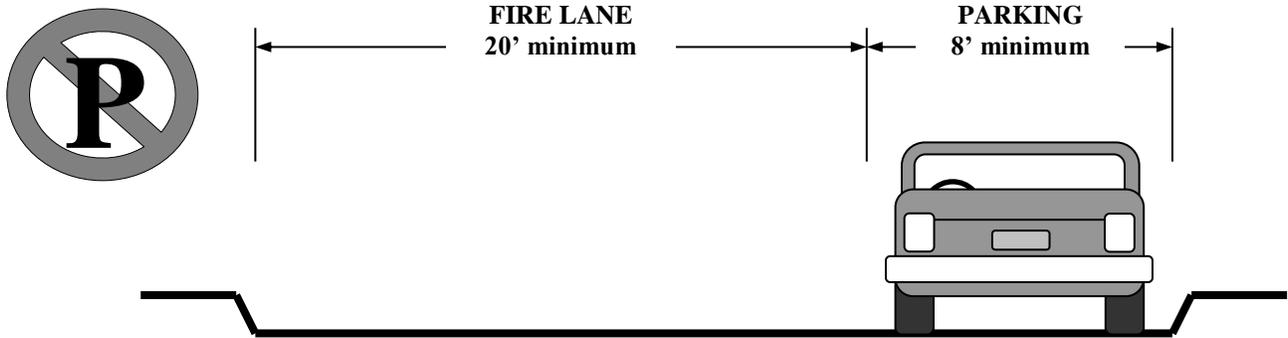
NOTE: This is only a listing of basic fire master plan submittal requirements. Other information or requirements may be necessary depending on conditions specific to each project.

ATTACHMENT 3 Minimum Road Widths

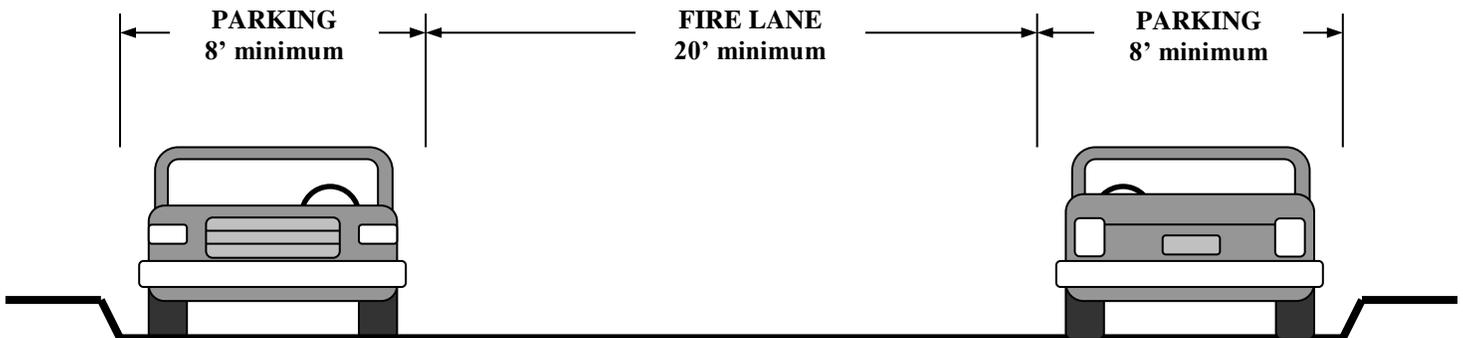
Measured from top face of curb to top face of curb for standard vertical curbs or flow line to flow line for rolled, ramped, or other curb types.



ROADWAY LESS THAN 28'
Parking prohibited.
Roadway is required to be posted as a fire lane.



ROADWAY AT LEAST 28' BUT LESS THAN 36'
Parking permitted on one side only.
Roadway is required to be posted as a fire lane.

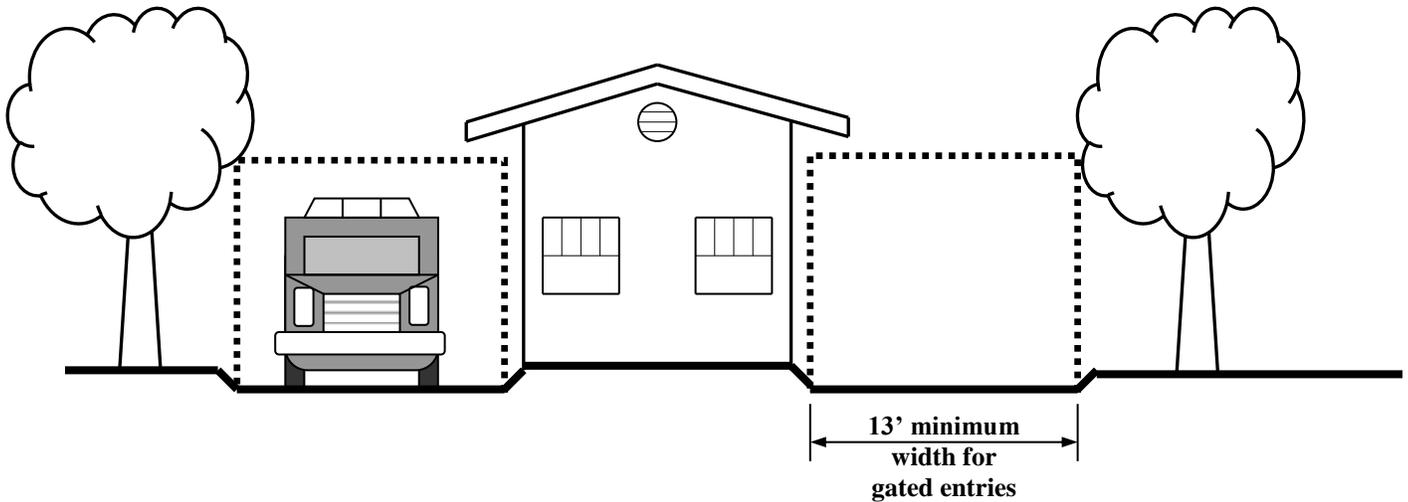


ROADWAY 36' OR WIDER
Parking permitted on both sides

ATTACHMENT 4

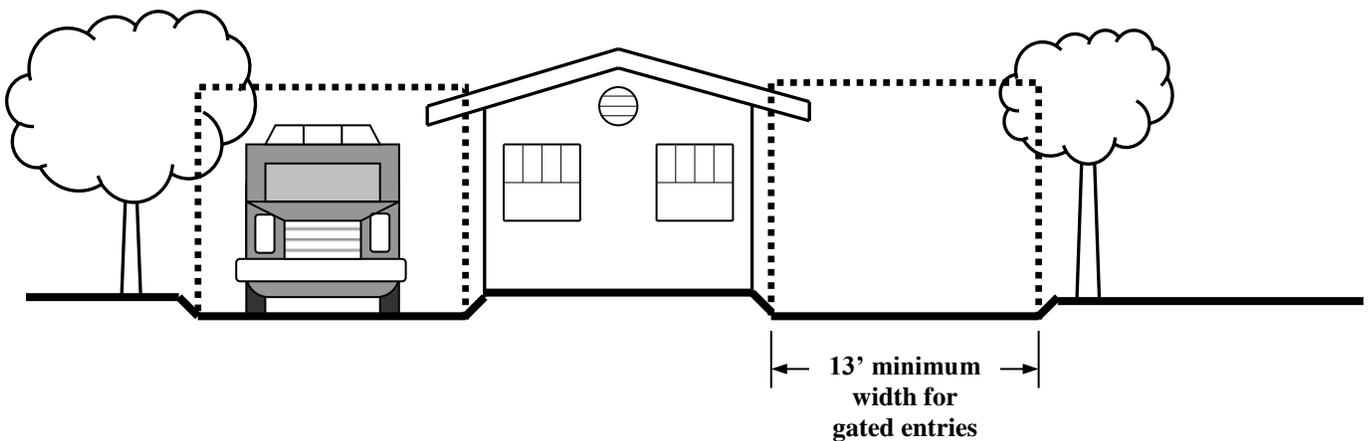
Fire Apparatus Access Roadway Clearance For Typical Gated Community Guard House

Fire lane width reductions detailed below are applicable only to the area immediately adjacent to the guard house or gate. Roads leading up to and beyond the guard house or gate shall meet standard fire lane width requirements prescribed in Section 2.A.5 of this guideline.



PROPER CLEARANCE PROVIDED

Eaves and vegetation do not encroach upon the 13'-wide by 13'-6" high minimum dimensions allowed for the fire access roadway next to the guard house.

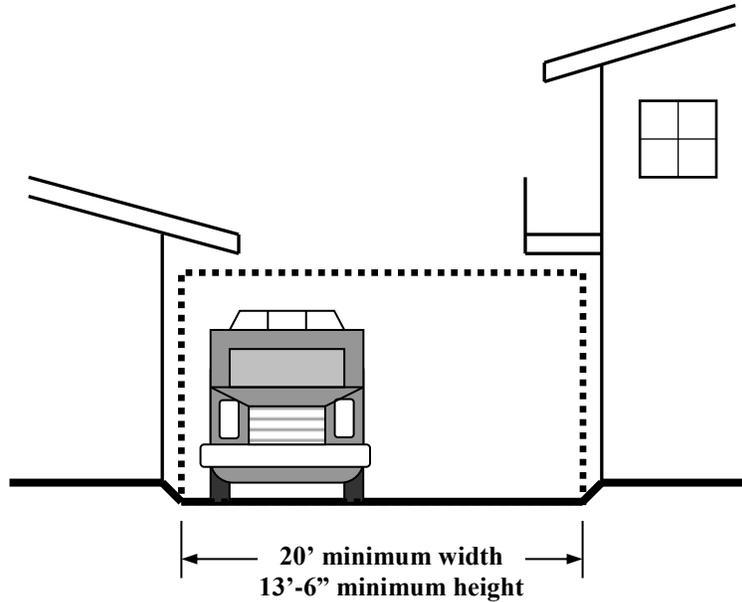


INSUFFICIENT CLEARANCE

While a 13'-wide access roadway is provided next to the guard house, eaves and vegetation encroach upon the minimum clear height of the fire lane.

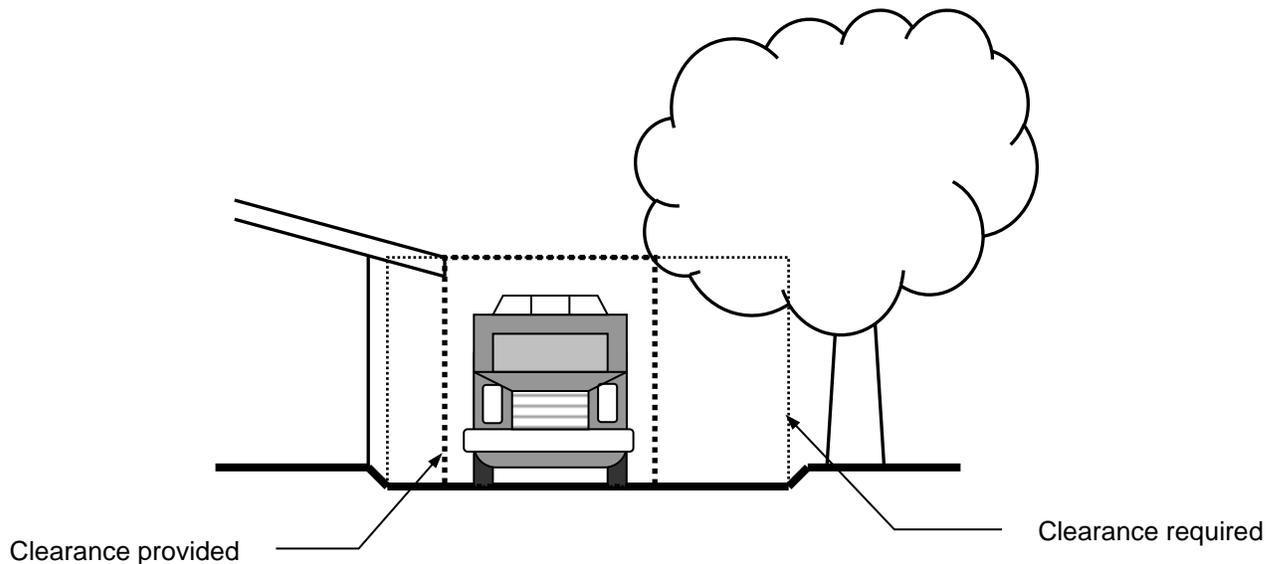
ATTACHMENT 5

Fire Apparatus Access Roadway Clearance



PROPER CLEARANCE PROVIDED

Eaves, balconies, and other obstructions do not encroach upon the 20' wide by 13'-6" high fire access roadway envelope.

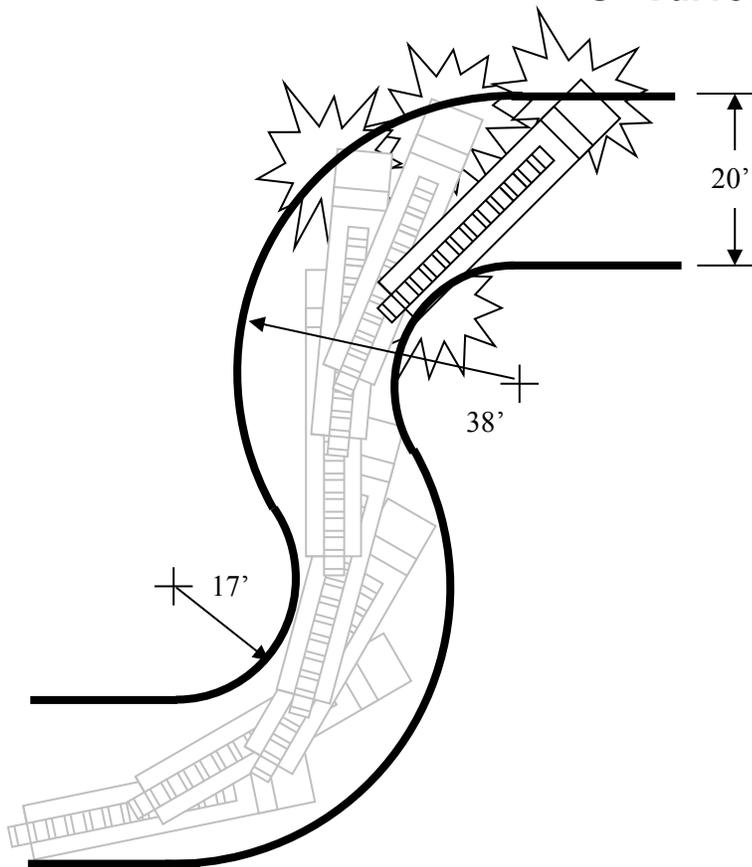


INSUFFICIENT CLEARANCE

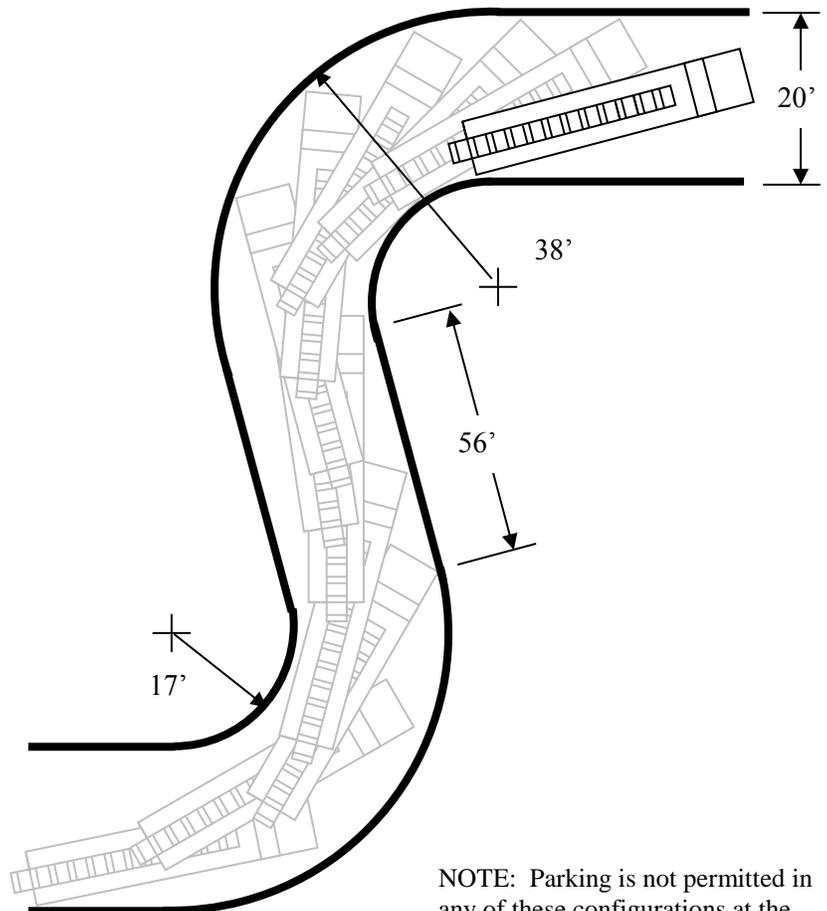
A 20'-wide roadway has been provided, but eaves and vegetation effectively reduce the clear dimensions below required minimums.

ATTACHMENT 6

"S" Curves



NOT PERMITTED
OCFA apparatus are unable to negotiate tight "S" curves, such as the one shown to the left.



PERMITTED

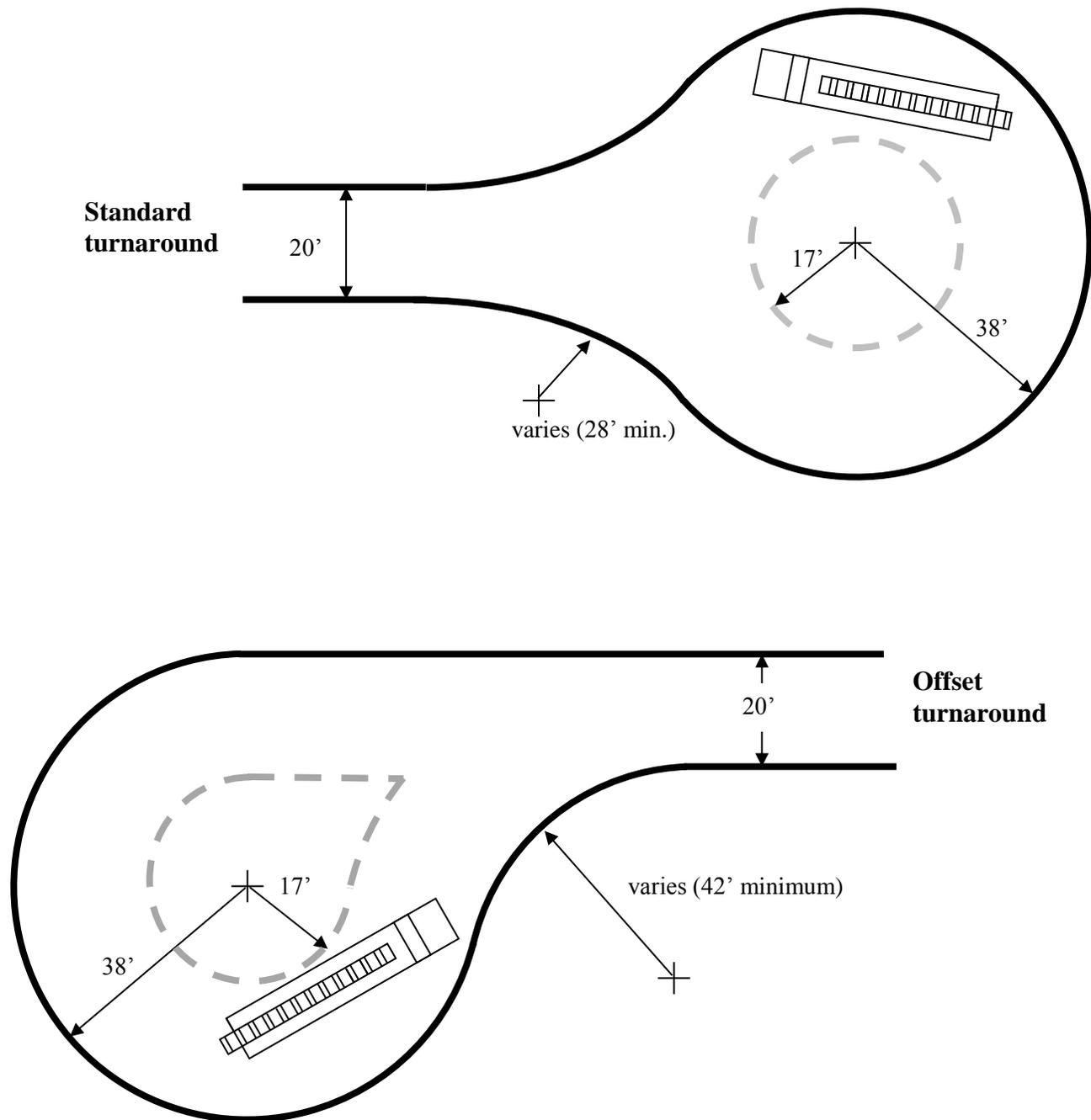
A 56' straight leg is required between the turns in a compound curve to provide sufficient recovery distance for the apparatus. Alternatively, the length of the straight leg may be reduced if the road width and/or turning radii are increased to allow for a wider turn.

NOTE: Parking is not permitted in any of these configurations at the dimensions shown.

Drawing not to scale; for illustration purposes only.

ATTACHMENT 7

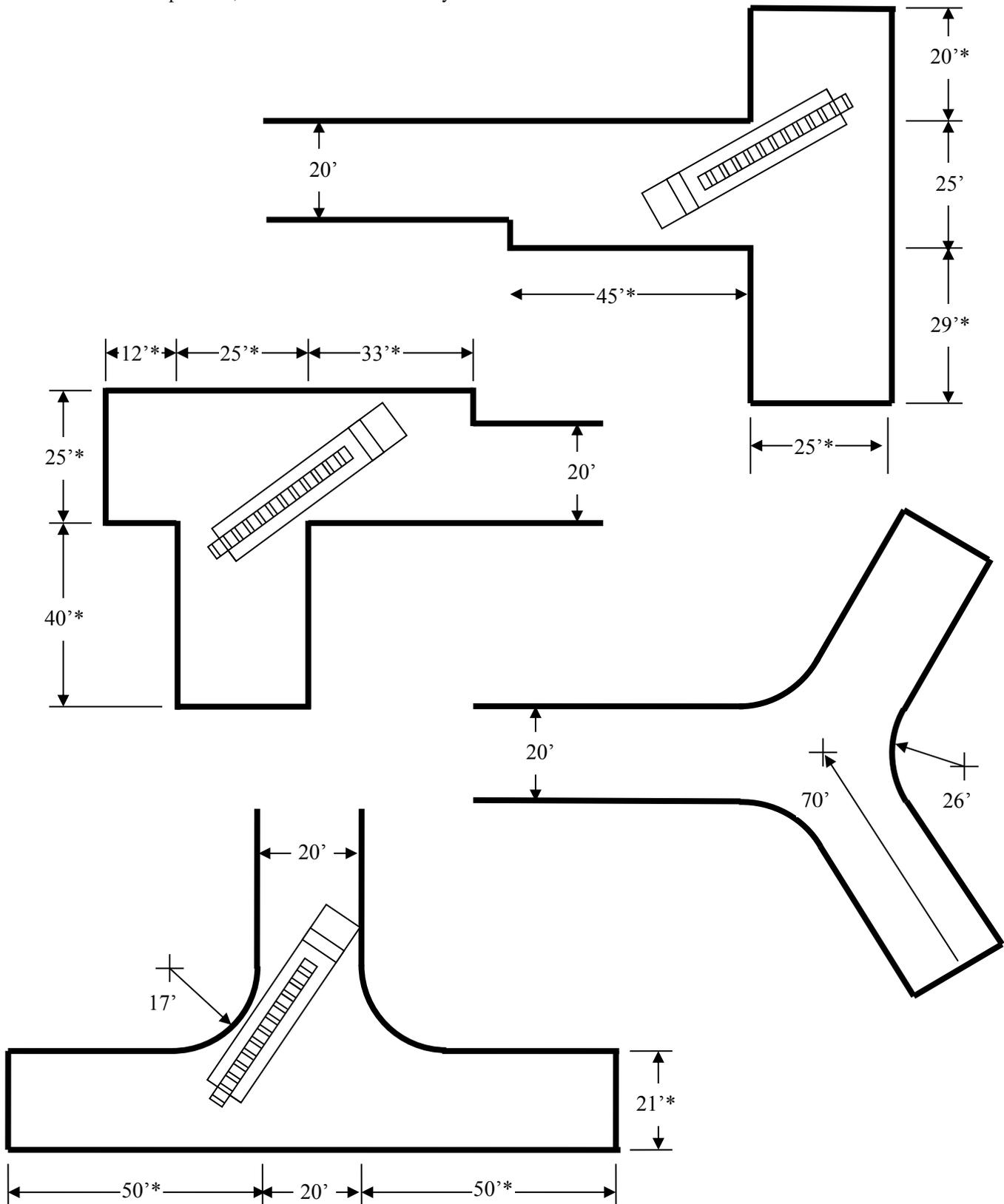
Minimum Turnaround and Hammerhead Dimensions



NOTE: Parking is not permitted in these turnarounds at the dimensions shown. Islands or other obstructions may be allowed to be located within the area bounded by the dashed line representing the inner turning radius.

NOTE: Parking is not permitted in any of these hammerheads at the dimensions shown.

* Wherever possible, increase this dimension by five feet.



ATTACHMENT 8

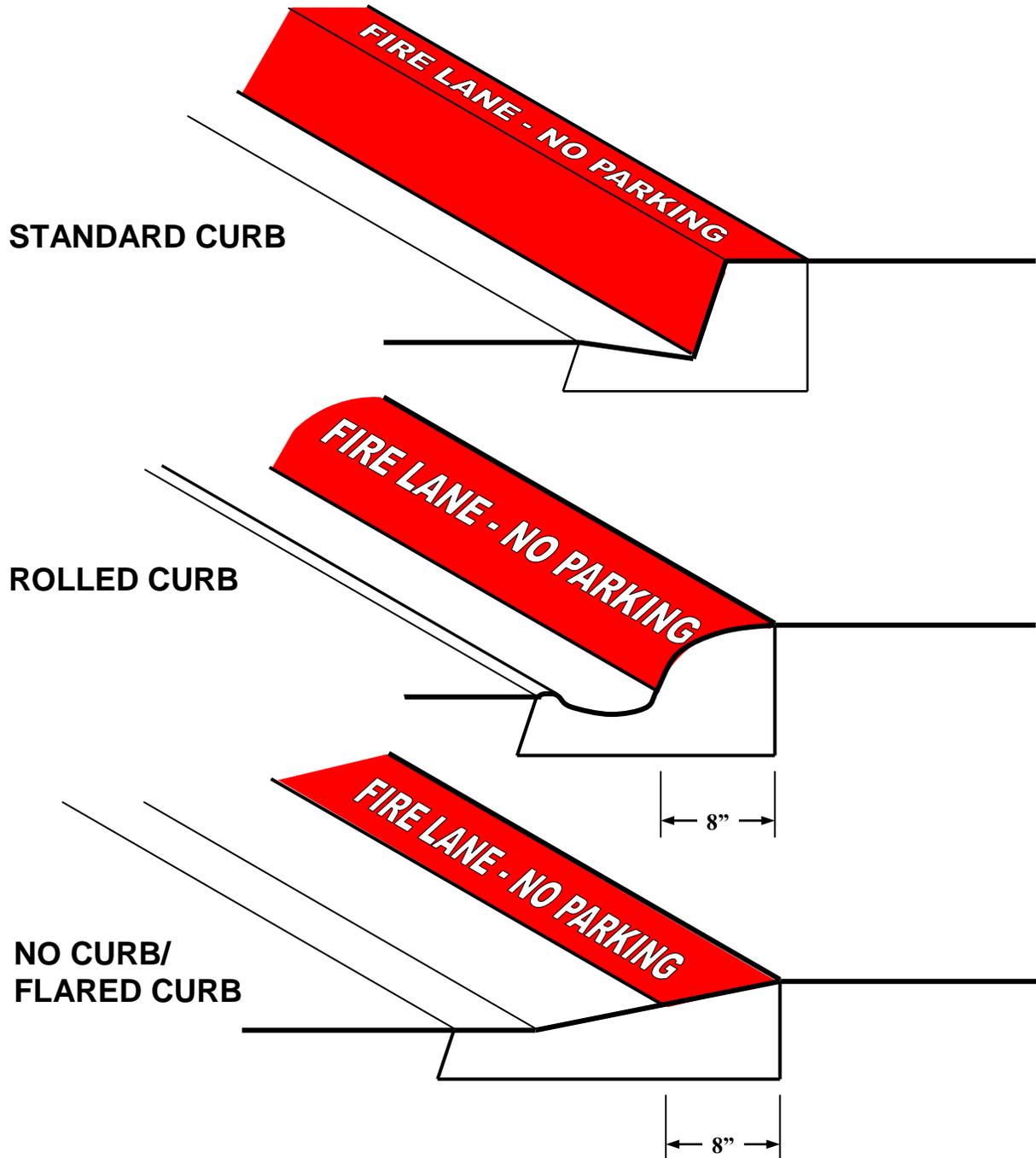
Fire Lane Parking Violations

The California Fire Code (CFC) and California Vehicle Code (CVC) specify rules of the road for stopping, standing, and parking in fire lanes or near fire hydrants.

- A. Section 22500.1 states that no person shall stop, park, or leave standing any vehicle whether attended or unattended, in any location designated as a fire lane by the Fire Authority except when necessary to avoid conflict with other traffic or in compliance with the direction of a peace officer or official traffic control device. Vehicles illegally parked in a fire lane may be towed per CVC 22953(b).
- B. There shall be no parking of any vehicles other than fire department vehicles within 15 feet of either side of a fire hydrant in accordance with CVC 22514(c). Such vehicles may be towed per CVC 22651(e).
- C. CVC 22658(a) permits the owner or person in lawful possession of any private property, subsequent to notifying local law enforcement, to cause the removal of a vehicle parked on such property to the nearest public garage, if:
 - 1) A sign is displayed in plain view at all entrances to the property specifying:
 - a) The ordinance prohibiting public parking, *and*
 - b) A notation indicating that vehicles will be removed at the owner's expense, *and*
 - c) The telephone number of the local traffic law enforcement agency, *or*
 - 2) The lot or parcel upon which the vehicle is parked has a single-family dwelling.
- D. CFC 503.4 states that the required width of a fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances shall be maintained at all times.
- E. CFC 507.5.4 states that vehicles and other obstructions 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 hydrants.

ATTACHMENT 9

Fire Lane Identification – Red Curbs



1. Fire lane entrance sign(s) shall also be provided per Attachment 10 or 11.
2. Curbs shall be painted OSHA safety red.
3. "FIRE LANE – NO PARKING" shall be painted on top of curb in 3" white lettering at a spacing of 30' on center or portion thereof.

ATTACHMENT 10

Specifications for Fire Lane Entrance Signs

To be used only at *vehicle entry points*
to areas that contain “Fire Lane—No Parking” signs or red curbs



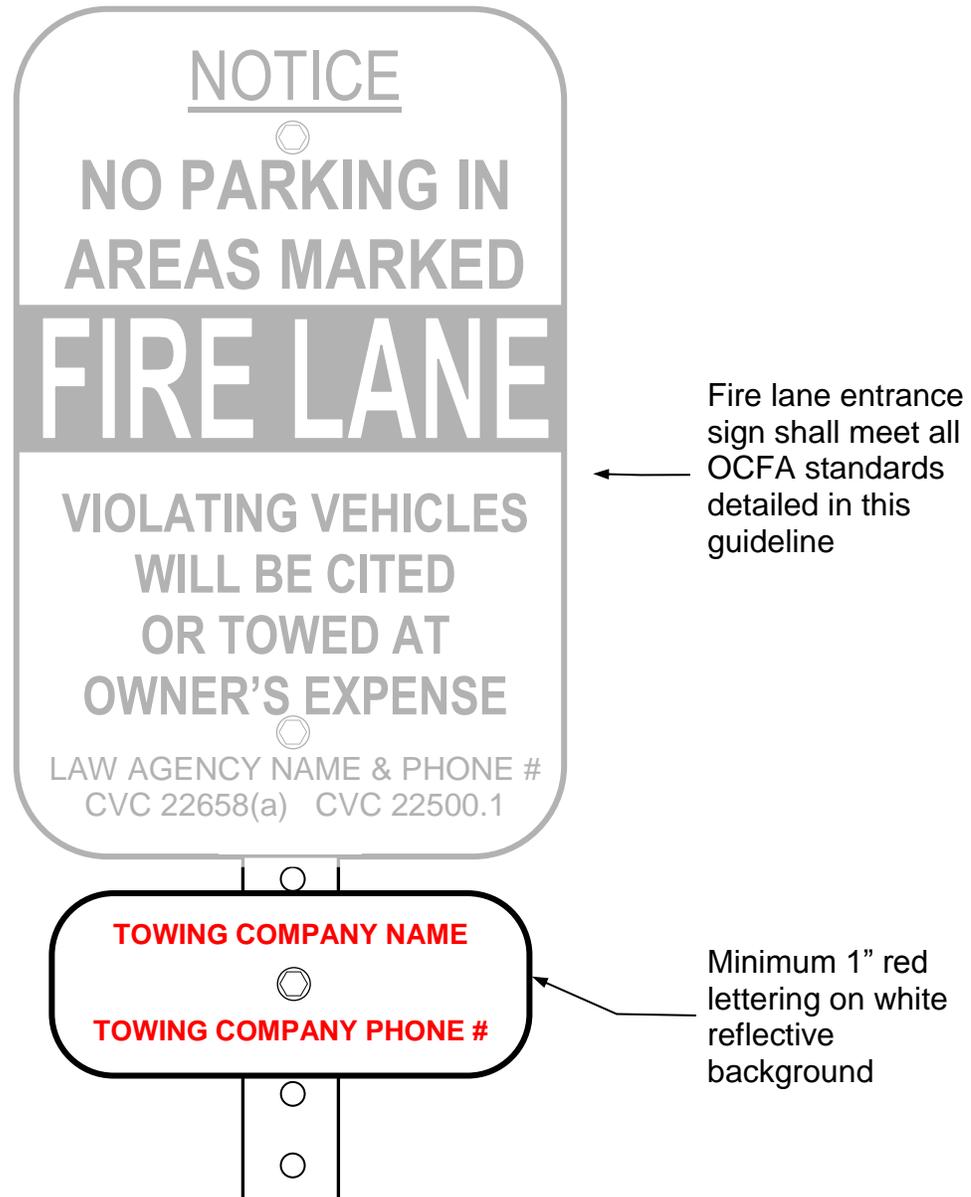
All sign and lettering dimensions shown are minimums. “Arial Narrow” font used is used in sample above though other legible sans-serif fonts may be acceptable.

This sign shall be posted at all vehicle entrances to areas marked with either red curbs or fire lane “No Parking” signs. Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 13 and 14.

Towing company contact information is required for all properties with a standing written agreement for services with a towing company per the California Vehicle Code.

ATTACHMENT 11

Specifications for Alternate Location of Towing Company Information



Towing company contact information is required for all properties with a standing written agreement for services with a towing company per the California Vehicle Code.

To facilitate periodic changes in towing company contracts, the towing company contact information may be posted on a separate sign mounted directly below the fire lane entrance sign instead of on the entrance sign itself. The method of attachment to the post shall not obscure the wording on either sign.

ATTACHMENT 12

Specifications for Fire Lane No Parking Signs



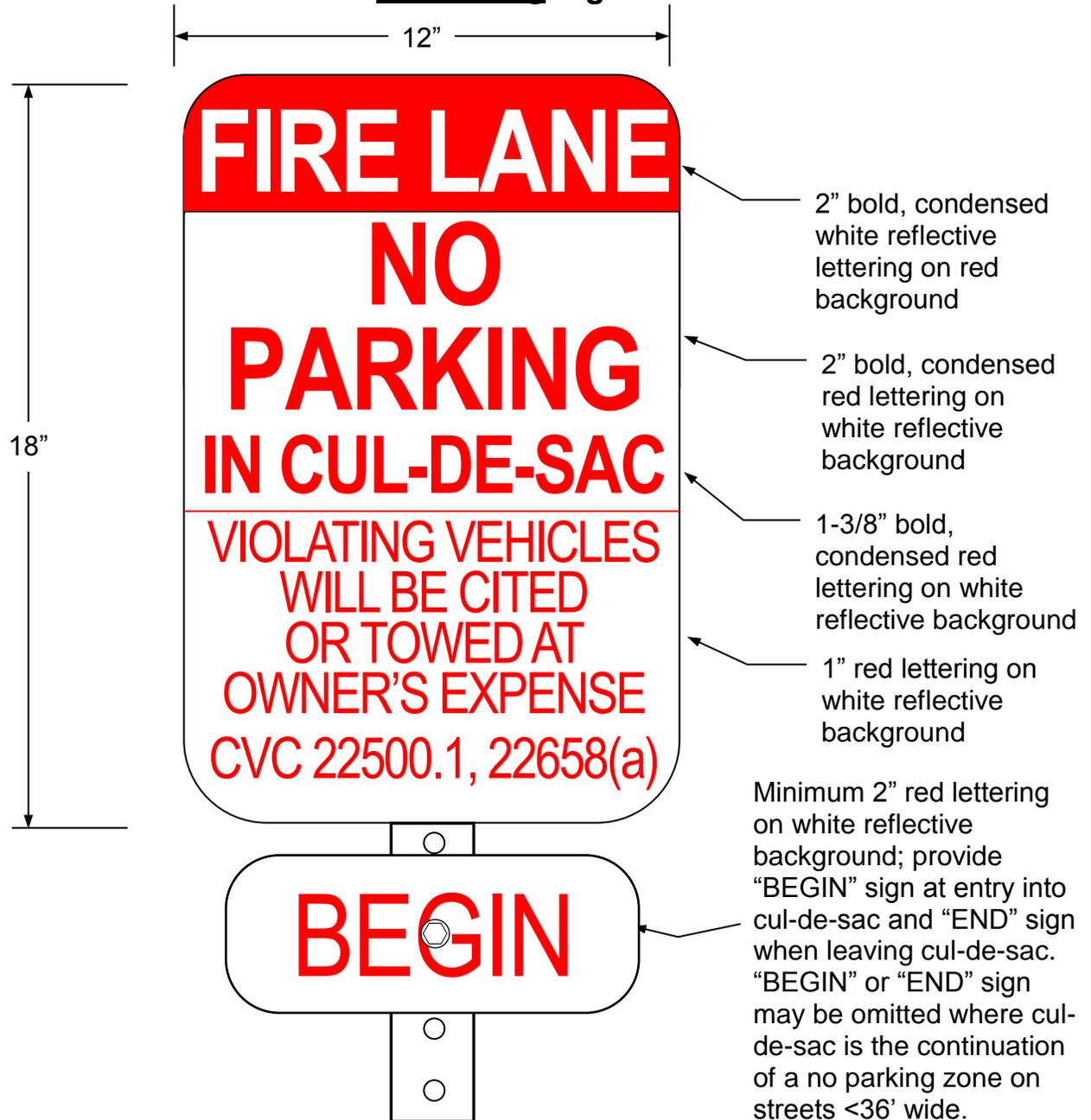
All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used is used in sample above though other legible sans-serif fonts may be acceptable.

In areas where fire lane parking restrictions are enforced by the California Highway Patrol, "NO STOPPING—FIRE LANE" signs meeting Caltrans standards shall be used.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 13 and 14.

ATTACHMENT 12a

Specifications for Cul-de-Sac Fire Lane No Parking Signs



All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used is used in sample above though other legible sans-serif fonts may be acceptable.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 13 and 14.

ATTACHMENT 12b

Specifications for Alternative Fire Lane No Parking Signs



← Additional verbiage shall be 1" bold, condensed red lettering on white reflective background. Where parking stalls are not present, sign may omit "except in designated stalls" and sign height may be reduced to 18".

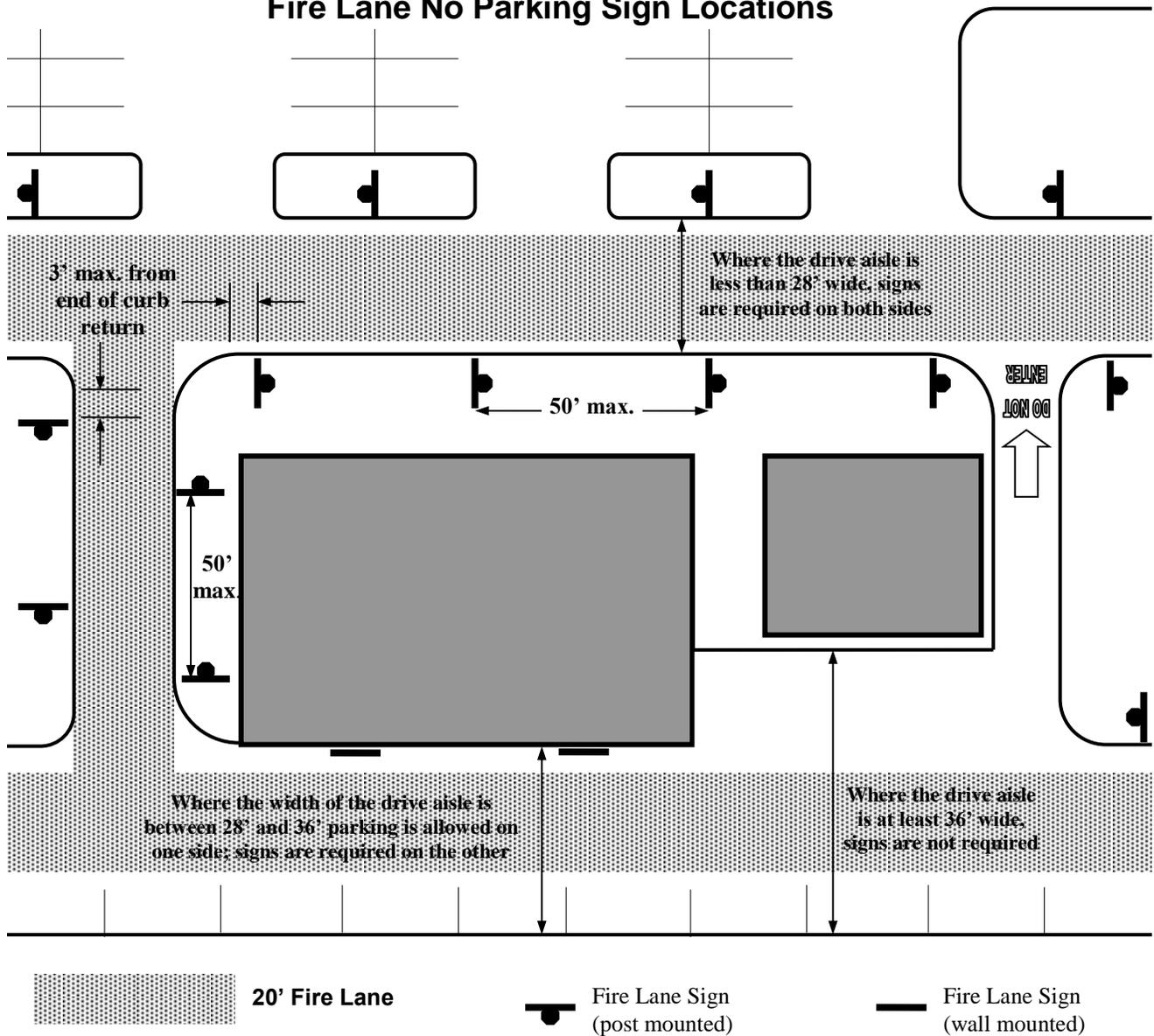
Specifications for the rest of the sign shall match those of standard fire lane no parking signs.

All sign and lettering dimensions shown are *minimums*. "Arial Narrow" font used is used in sample above though other legible sans-serif fonts may be acceptable.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachments 13 and 14.

ATTACHMENT 13

Fire Lane No Parking Sign Locations

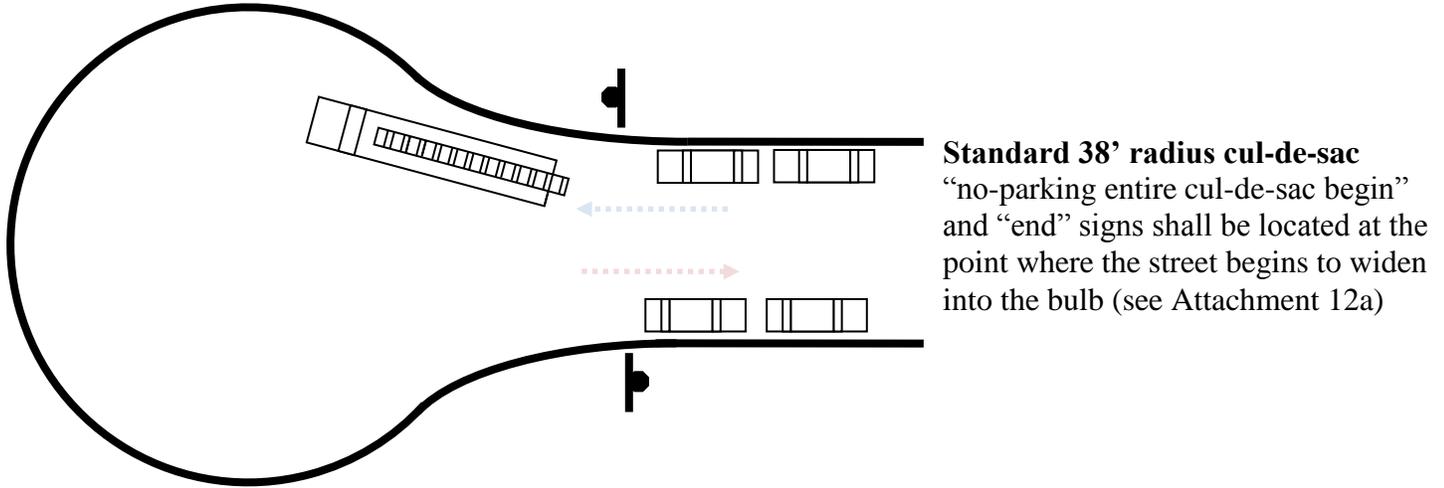


Signs are required within 3' of the end of the curb return at the beginning of each "block" along the fire lane and spaced a maximum of 50' along the entire designated lane. A sign shall be located within a reasonable distance of the end of each block as necessary to clearly identify the extent of the no parking zone. One sign is required for each island adjacent to the fire lane that is large enough to accommodate a parked car.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachment 14. Where sign posts are not practical, signs may be mounted on a wall or fence and are allowed to be oriented perpendicular to the length of the fire lane. OCFA inspectors will determine if additional signs or sign locations are required.

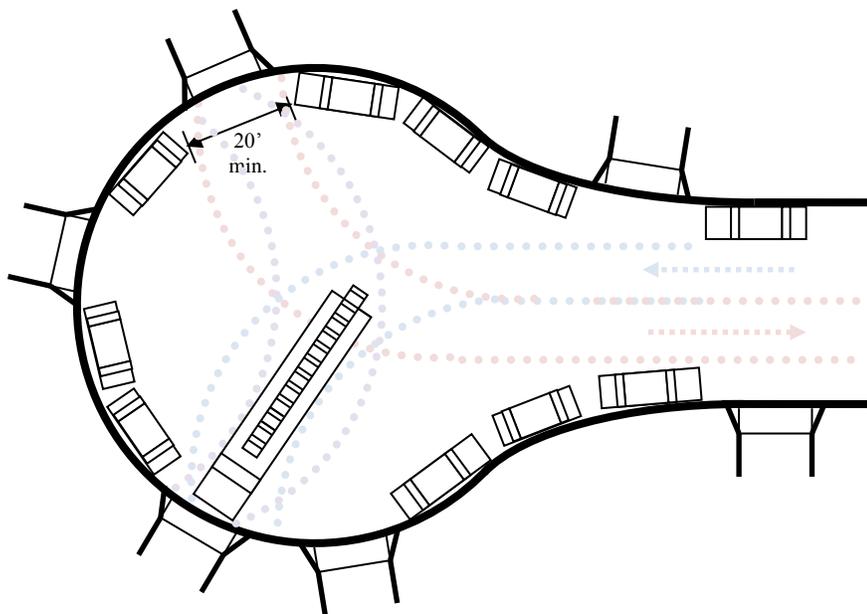
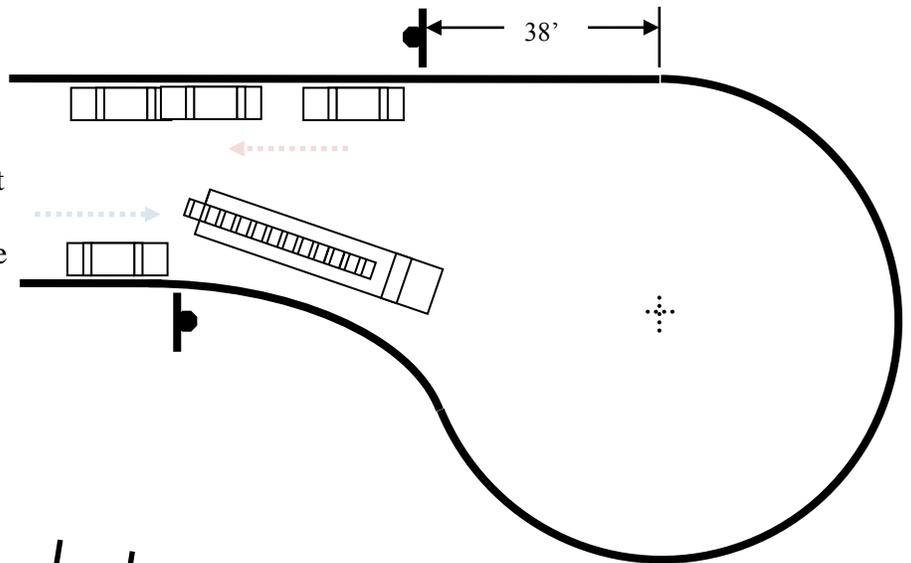
ATTACHMENT 13a

Fire Lane No Parking Sign Locations for Cul-de-sacs



Standard 38' radius cul-de-sac
“no-parking entire cul-de-sac begin” and “end” signs shall be located at the point where the street begins to widen into the bulb (see Attachment 12a)

Offset 38' radius cul-de-sac: “no-parking entire cul-de-sac begin” and “end” signs shall be located at the point where the street begins to widen into the bulb and at a point 38' from where the cul-de-sac and street are tangent (see Attachment 12a)

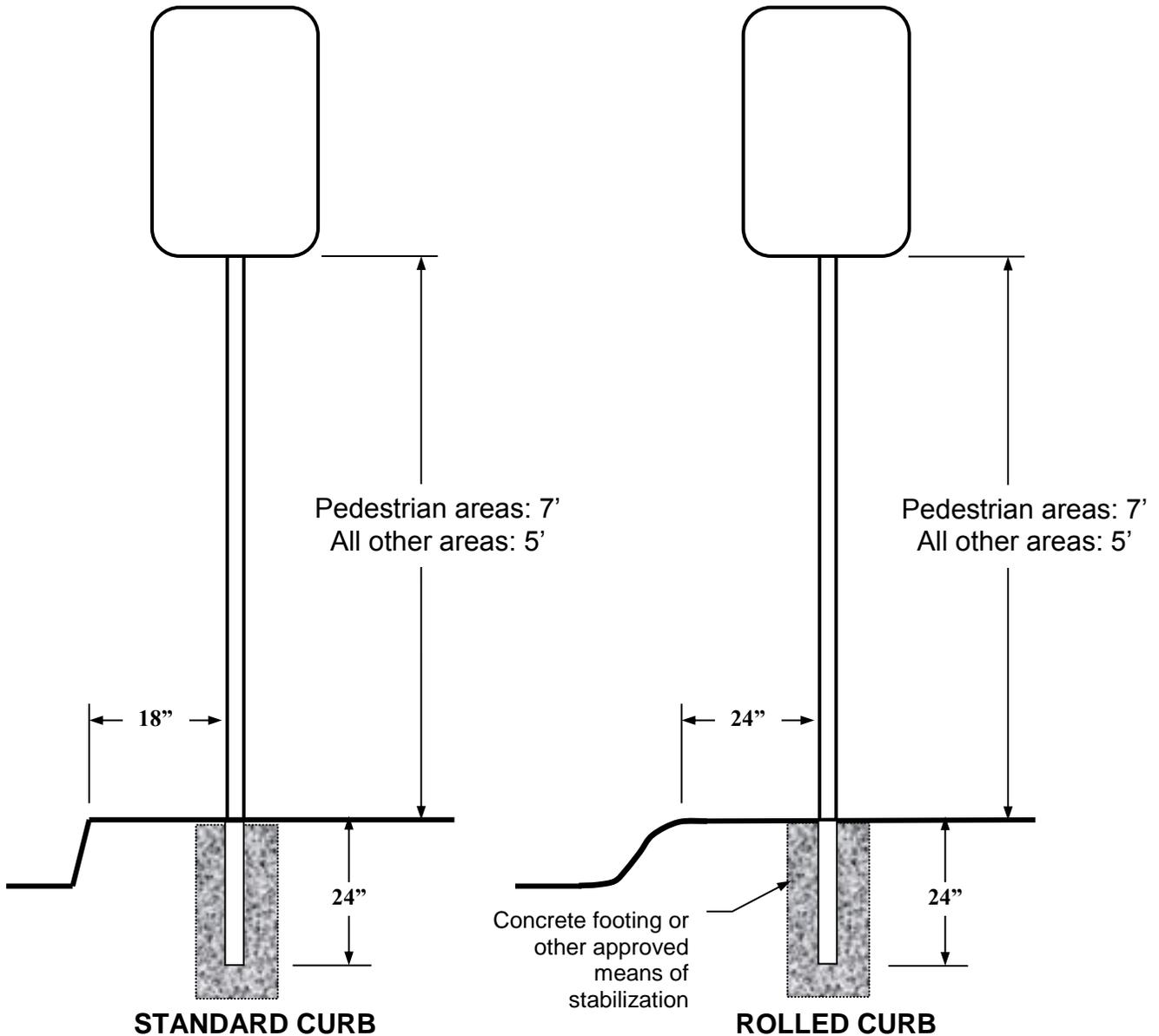


Where size and placement of driveways ensure sufficient space is available to execute a three-point turn, no-parking signs are unnecessary.

*Drawing
not to scale*

ATTACHMENT 14

Mounting Specifications for Fire Lane Entrance and No Parking Signs



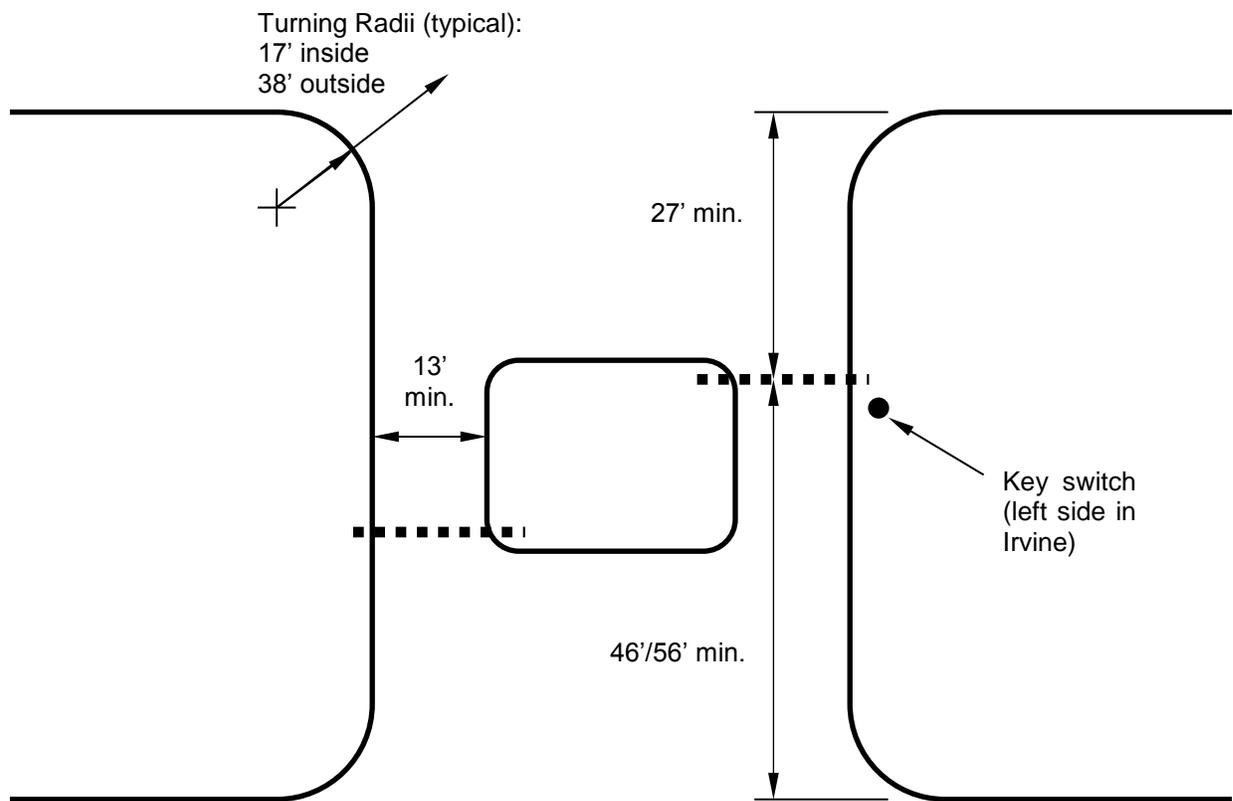
Signs shall be mounted facing the direction of vehicular travel.

Signs may be mounted on existing posts or buildings where the centerline of the sign is no more than 24" from the edge of the roadway.

Depth of bury shall be a *minimum* of 24" and rebar, a concrete footing, or another method to prevent removal of the sign is recommended. Footings for signs located in the public right-of-way shall be per the local jurisdiction's requirements.

ATTACHMENT 15

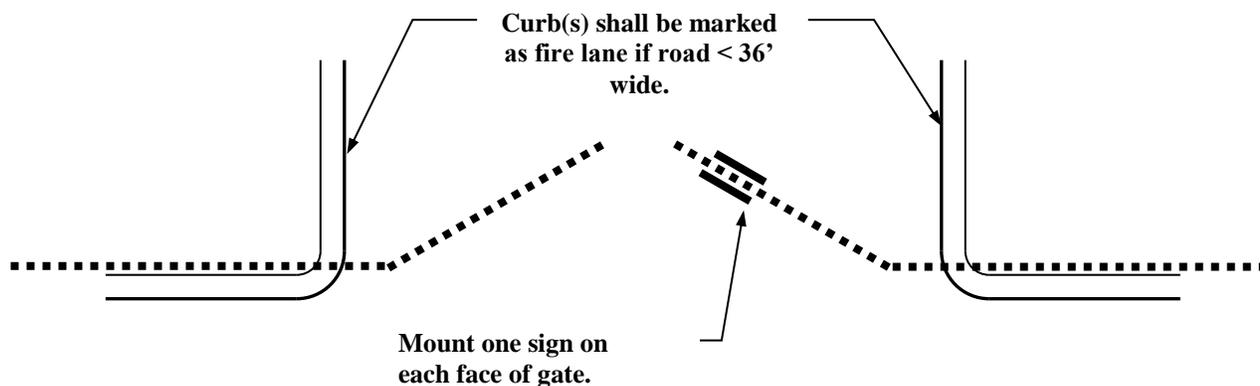
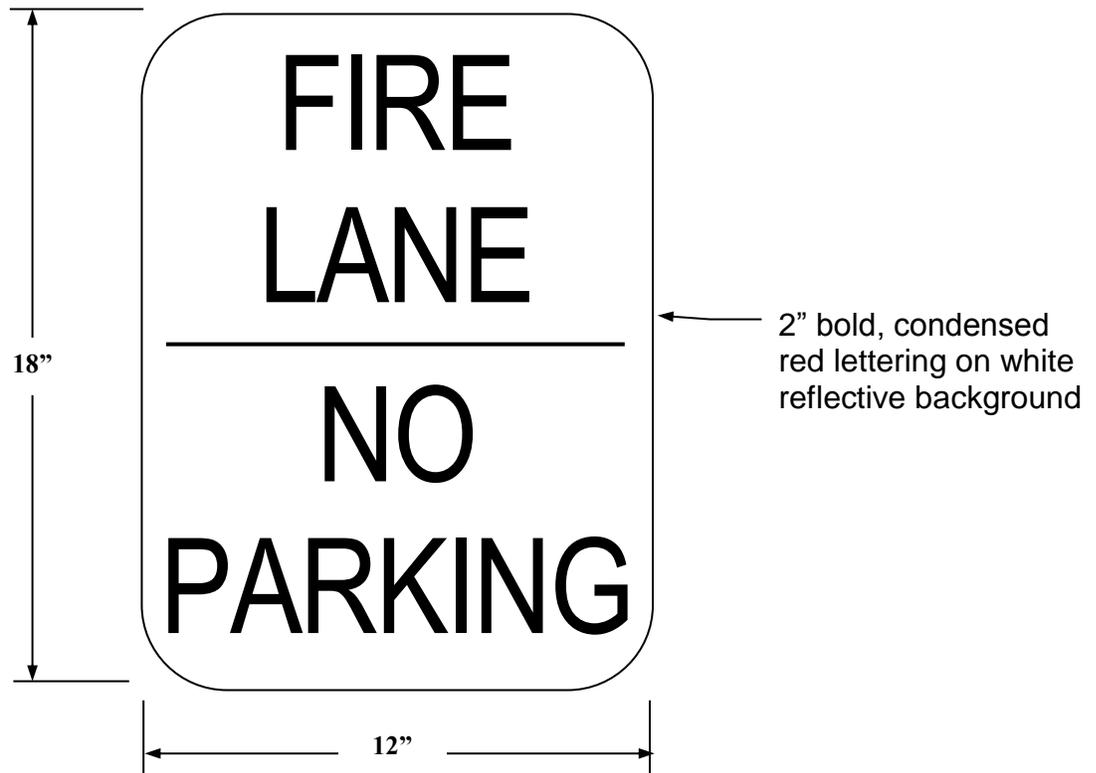
Minimum Gate Setbacks



*Drawing
not to scale*

ATTACHMENT 16

Specifications for “Fire Lane - No Parking” Signs for Manually Operated Gates and Barriers



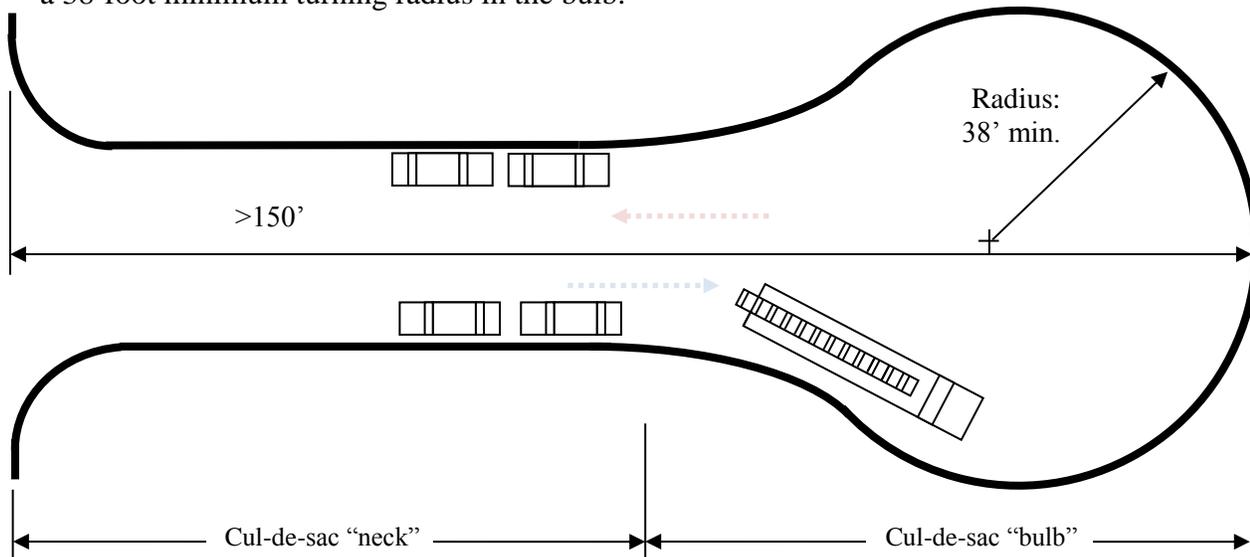
All sign and lettering dimensions shown are minimums. “Arial Narrow” font used is used in sample above though other legible sans-serif fonts may be acceptable.

“Fire Lane—No Parking” sign shown in Attachment 12 may be used as an alternative. Signs shall be securely mounted on the front and back face of the gate clearly visible to traffic entering the designated area. Signs shall be made of a durable material.

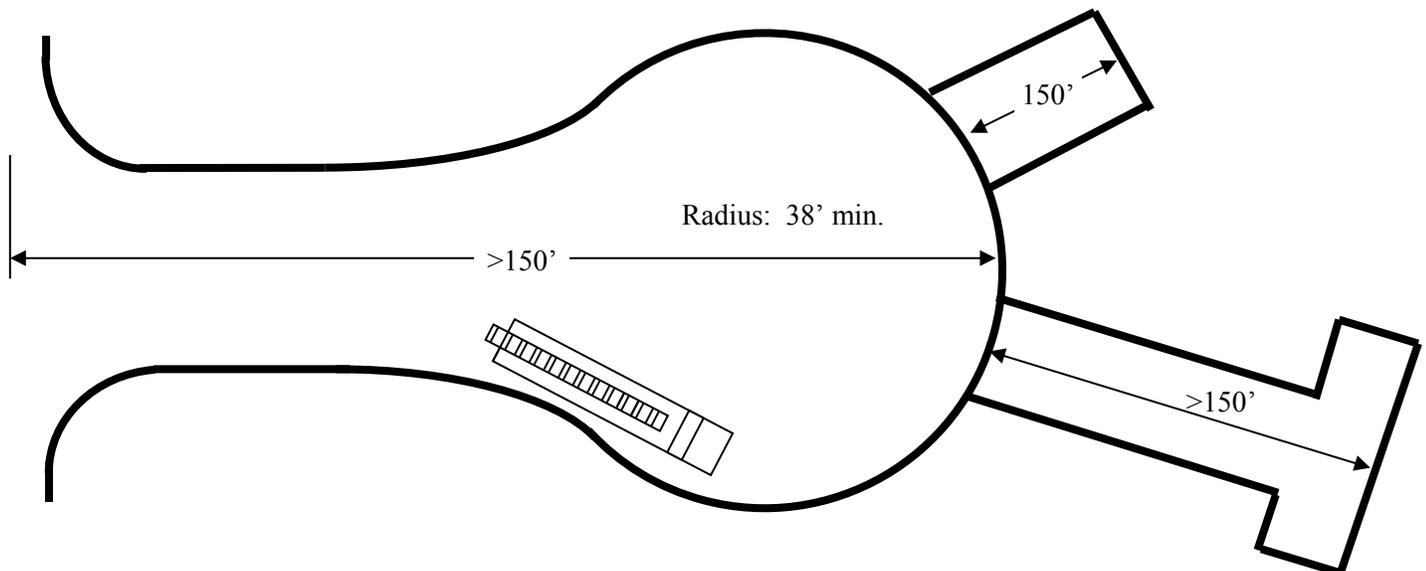
ATTACHMENT 17

Cul-de-sacs and Dead-end Roadways

- 1) Cul-de-sac streets greater than 150 feet in length that are required fire lanes shall be provided with a 38-foot minimum turning radius in the bulb.



- 2) Where a spur road or private driveway that is a required fire lane is accessed via the cul-de-sac road, the driveway or spur shall be no more than 150' in length unless an approved turnaround has been provided within 150' of the end of the spur or driveway.



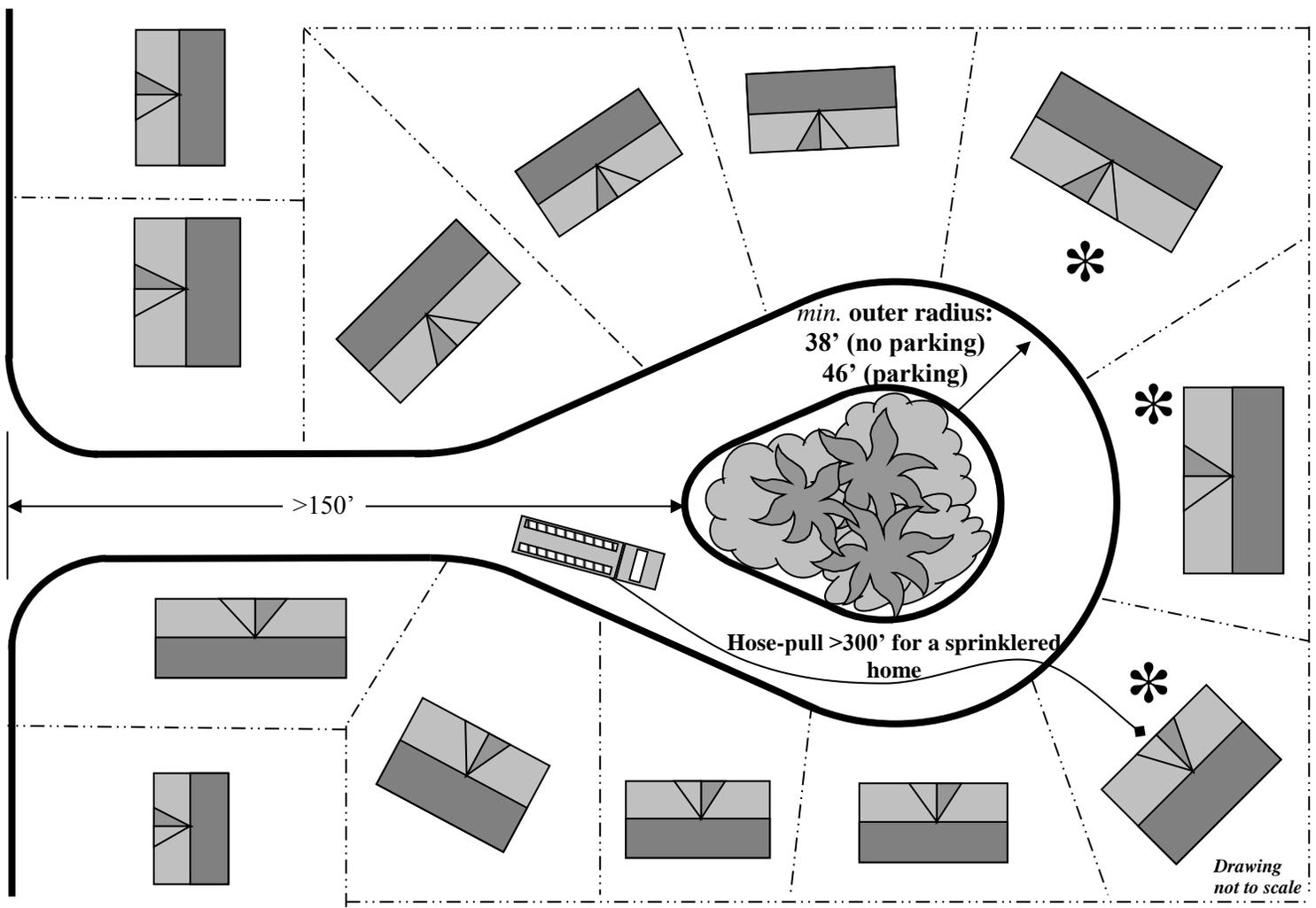
*Drawing
not to scale*

ATTACHMENT 18

Cul-de-sacs Longer than 150' with Islands

Cul-de-sac streets greater than 150 feet in length may contain a center island provided that:

- 1) A *minimum* 28-foot-wide drive lane with an adequate inside turning radius is provided, and
- 2) The island is designated a no parking area with red curbs or signs, and
- 3) Island landscaping will not intrude into the drive lane, and
- 4) An NFPA 13-D sprinkler system with full protection of the attic space(s) is installed in the homes where hose-pull requirements can only be satisfied by taking access from the drive lane beyond the beginning of the island.

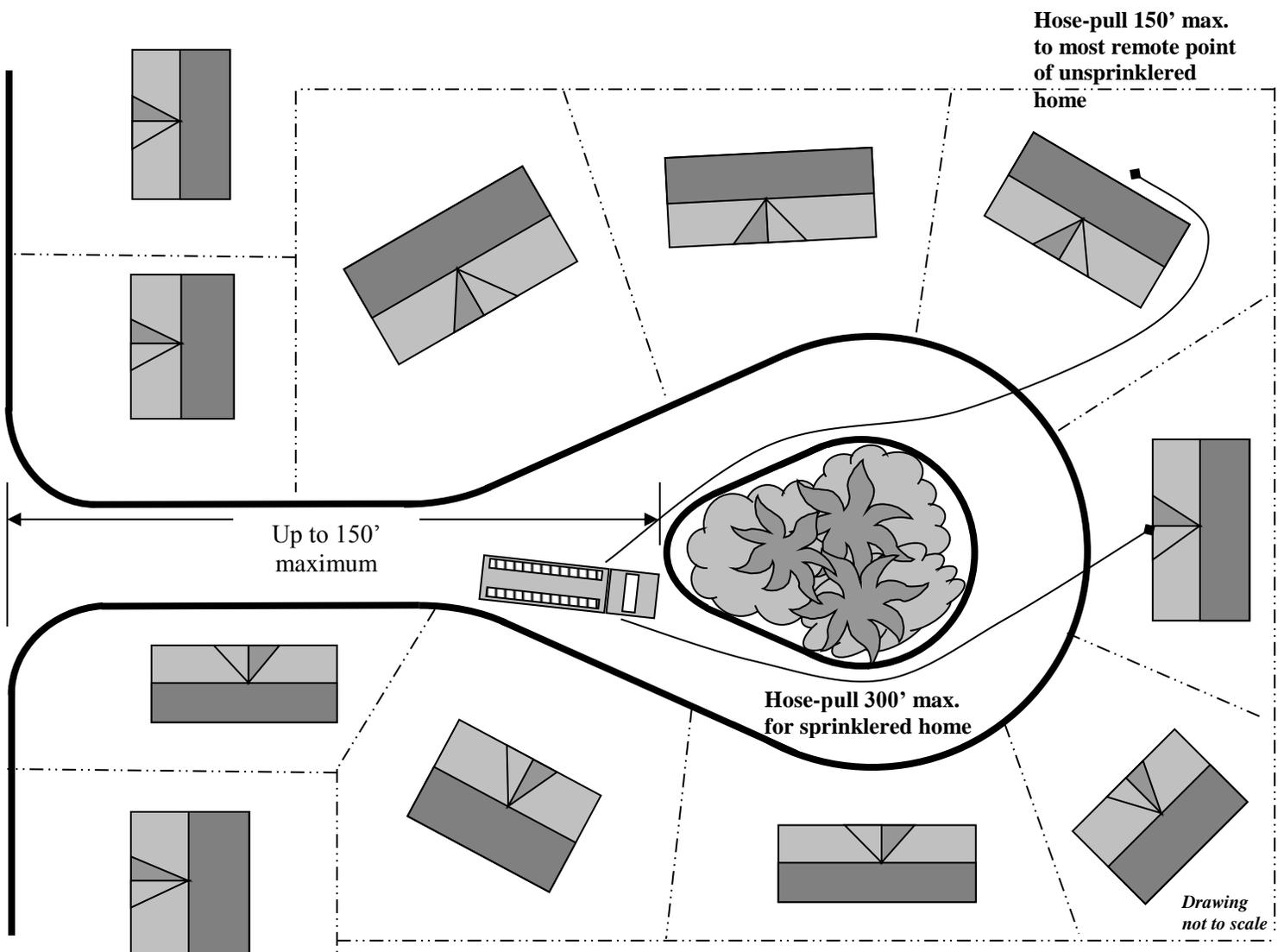


- * Attic protection required where hose-pull distance from the portion of the cul-de-sac preceding the island to the front entry of a sprinklered home exceeds 300'. For existing unsprinklered homes, hose pull may not exceed 150' to the most remote point around the perimeter of the home or sprinklers with attic protection will be required.

ATTACHMENT 19

Cul-de-sacs up to 150' with Islands

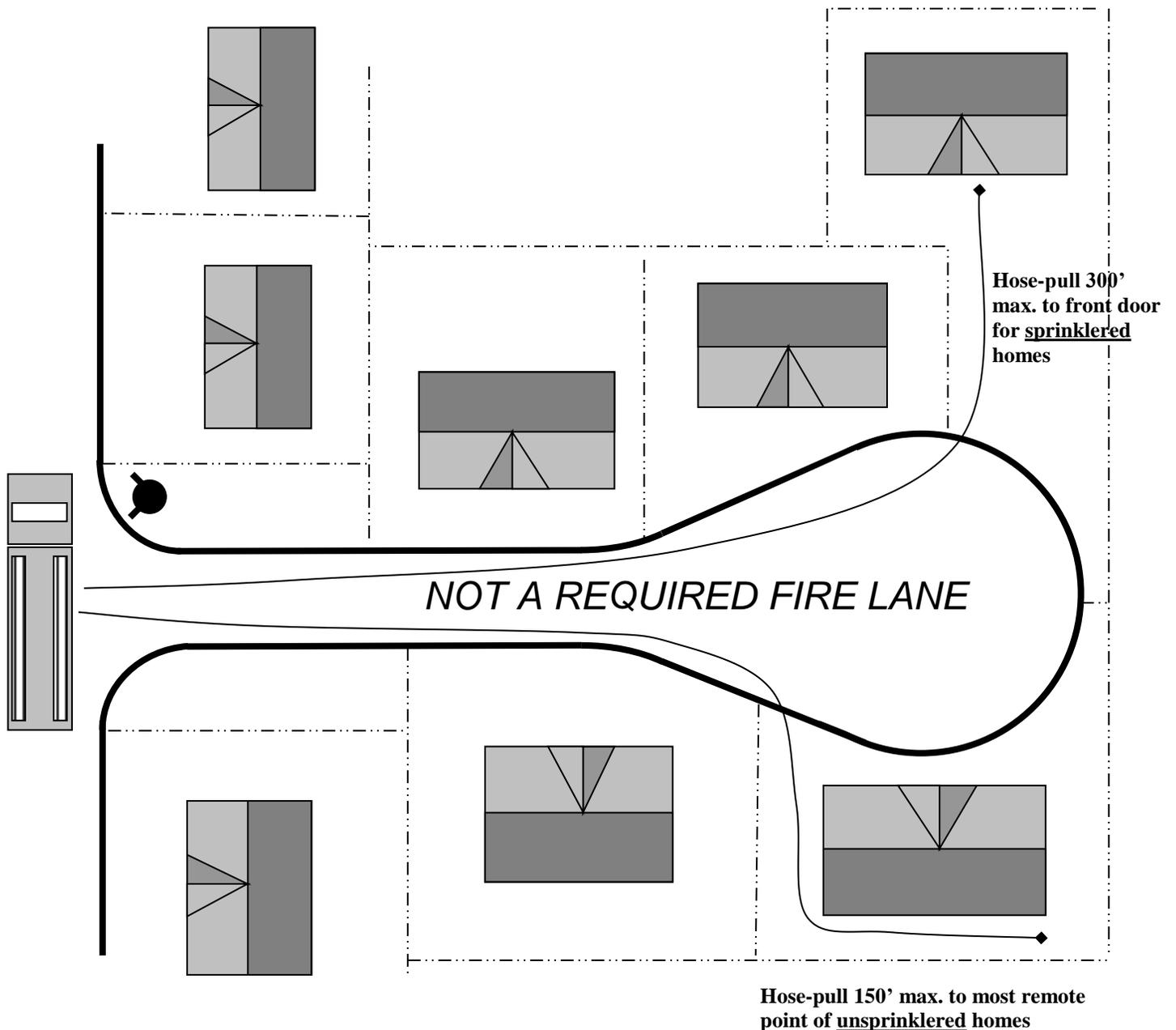
Access to the homes will be measured along an approved route around the island and any other obstructions in the path of travel from the point where the island begins to impede fire apparatus. If hose-pull to the main entry of a sprinklered home exceeds 300' (or 150' to the most remote point around the perimeter for unsprinklered homes), the portion of the bulb beyond the island shall be designed as a fire lane or other mitigating features shall be provided. If all homes are in access from the area preceding the island, the portion of the bulb beyond the island is not required to comply with OCFA fire access roadway requirements. The neck and portion of the bulb preceding the island shall meet all other fire lane requirements prescribed in this guideline if it is a required fire lane.



ATTACHMENT 20

Short Cul-de-sacs and Dead-end Roads

If hose-pull distance can be satisfied without fire apparatus entering the cul-de-sac or dead-end road, and the road is not otherwise required to be a fire lane as determined by the fire code official, the street is not required to have a bulb or hammerhead with minimum OCFA turning radii or meet other standard fire lane requirements.

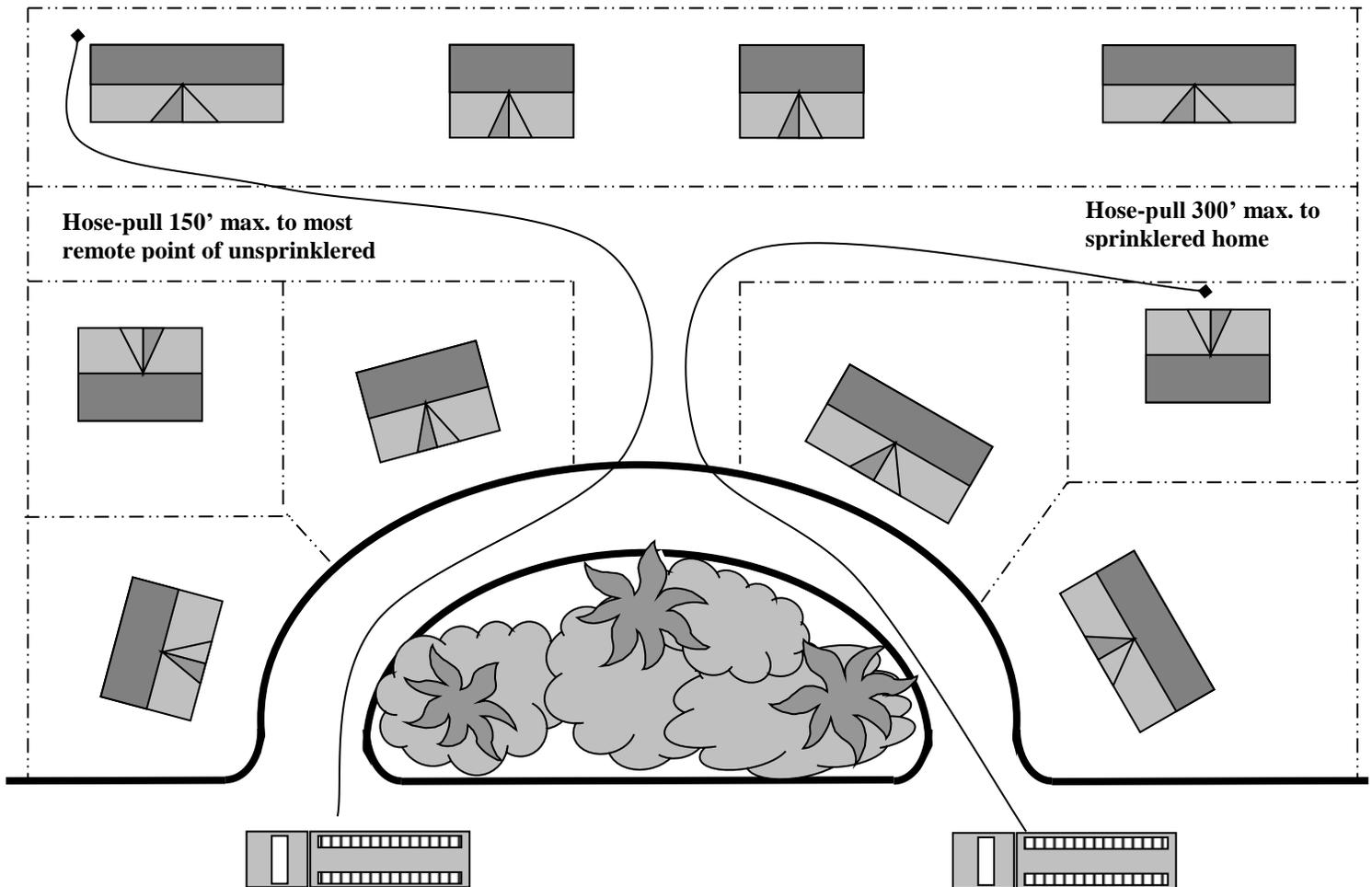


*Drawing
not to scale*

ATTACHMENT 21

Eyebrows

If the eyebrow does not meet OCFA's minimum turning radius and width requirements, fire department access will be measured from the nearest available fire lane around the island and any other obstructions. If hose-pull to the main entry of a sprinklered home exceeds 300' (or 150' to the most remote point around the perimeter for unsprinklered homes), the eyebrow shall be designed as a fire lane or other mitigating features shall be provided.



*Drawing
not to scale*

ATTACHMENT 22

Sample Parking Enforcement Letter

Date

Planning and Development Services Section
Orange County Fire Authority
1 Fire Authority Road
Irvine, CA. 92602

Re: *(Project Name, Location, and Service Request Number)*
Parking Enforcement Plan

The fire lane parking enforcement plan for the above referenced project is stated as follows:

All fire lanes within *(list development address or tract information)* shall be maintained and in no event shall parking be permitted along any portion of a street or drive that required fire lanes or any area designated as a fire lane for turn-around purposes either during construction or after occupancy.

(Association name) shall adopt reasonable rules and regulations regarding the parking of vehicles along the streets, roads and or drives within the project that are not in conflict with applicable law.

In furtherance thereof, *(Association name)*, through its officers, committees and agents, will establish the “parking” and “no parking” areas within the property in accordance with Section 22658.2 of the California Vehicle Code and OCFA Guideline B-09. The law shall be enforced through such rules and regulations by all lawful means, including, written warnings, citing, levying fines and towing vehicles in violation.

(Association name) will contract with a certified patrol and towing company to remove vehicles that violate no parking restrictions. First time violators will receive a written warning and with subsequent violations, the vehicle shall be subject to towing. The vehicle owner shall be responsible for all costs incurred in remedying such violation, including without limitation towing cost, citations and legal fees.

Company Name
Authorized Agent Signature

Cc:

ATTACHMENT 23

CFC TABLE B105.1: Minimum Required Fire Flow and Flow Duration for Buildings as adopted by the OCFA

FIRE FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons/min) ²		Flow Duration
Type IA/IB ¹	Type IIA/IIIA ¹	Type IV/VA ¹	Type IIB/IIIB ¹	Type VB ¹	unsprinklered ³	sprinklered ⁴	
0-22700	0-12700	0-8200	0-5900	0-3600	1500	1500	2
22701-30200	12701-17000	8201-10900	5901-7900	3601-4800	1750	1500	
30201-38700	17001-21800	10901-12900	7901-9800	4801-6200	2000	1500	
38701-48300	21801-24200	12901-17400	9801-12600	6201-7700	2250	1500	
48301-59000	24201-33200	17401-21300	12601-15400	7701-9400	2500	1500	
59001-70900	33201-39700	21301-25500	15401-18400	9401-11300	2750	1500	
70901-83700	39701-47100	25501-30100	18401-21800	11301-13400	3000	1500	3
83701-97700	47101-54900	30101-35200	21801-25900	13401-15600	3250	1625	
97701-112700	54901-63400	35201-40600	25901-29300	15601-18000	3500	1750	
112701-128700	63401-72400	40601-46400	29301-33500	18001-20600	3750	1875	
128701-145900	72401-82100	46401-52500	33501-37900	20601-23300	4000	2000	4
145901-164200	82101-92400	52501-59100	37901-42700	23301-26300	4250	2125	
164201-183400	92401-103100	59101-66000	42701-47700	26301-29300	4500	2250	
183401-203700	103101-114600	66001-73300	47701-53000	29301-32600	4750	2375	
203701-225200	114601-126700	73301-81100	53001-58600	32601-36000	5000	2500	
225201-247700	126701-139400	81101-89200	58601-65400	36001-39600	5250	2625	
247701-271200	139401-152600	89201-97700	65401-70600	39601-43400	5500	2750	
271201-295900	152601-166500	97701-106500	70601-77000	43401-47400	5750	2875	
295901+	166501+	106501-115800	77001-83700	47401-51500	6000	3000	
		115801-125500	83701-90600	51501-55700	6250	3125	
		125501-135500	90601-97900	55701-60200	6500	3250	
		135501-145800	97901-106800	60201-64800	6750	3375	
		145801-156700	106801-113200	64801-69600	7000	3500	
		156701-167900	113201-121300	69601-74600	7250	3625	
		167901-179400	121301-129600	74601-79800	7500	3750	
		179401-191400	129601-138300	79801-85100	7750	3875	
		191401+	138301+	85101+	8000	4000	

¹ **Construction Types:** based upon actual construction without applying 1-hour equivalency allowed by CBC Table 601 footnote 'd'.

² **Fire flow:** measured at 20 psi.

³ **Unsprinklered homes:** Minimum fire flow for a detached, unsprinklered single-family residence/duplex up to 3600 sq.ft. is 1000 gpm for one hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet shall not be less than that specified in the table above.

⁴ **Sprinklered homes:** When a detached single-family residence/duplex is equipped with an approved automatic sprinkler system, the fire flow may be reduced to 50% of that required for an unsprinklered structure, provided that the resulting fire flow is not less than 1,000 gallons per minute for 1 hour.

ATTACHMENT 24

CFC TABLE C105.1: Hydrant Quantity and Spacing as adopted by the OCFA

FLOW REQUIREMENT from Table B105.1	Minimum # of Hydrants	Average Hydrant Spacing (feet) ^{1, 2, 3, 6}	Maximum Distance to Hydrant (feet) ^{4,7}
up to 1750	1	500	250
1751-2250	2	450	225
2251-2500	3	450	225
2501-3000	3	400	225
3001-4000	4	350	210
4001-5000	5	300	180
5001-5500	6	300	180
5501-6000	6	250	150
6001-7000	7	250	150
7001+	8 or more ⁵	200	120

¹ Reduce by 100 feet for dead-end streets or roads.

² Where streets are provided with median dividers which can be crossed by fire fighters pulling hose lines, or where arterials streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis up to a fire-flow requirement of 7,000 gallons per minute and 400 feet for higher fire-flow requirements.

³ Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

⁴ Reduce by 50 feet for dead-end streets or roads.

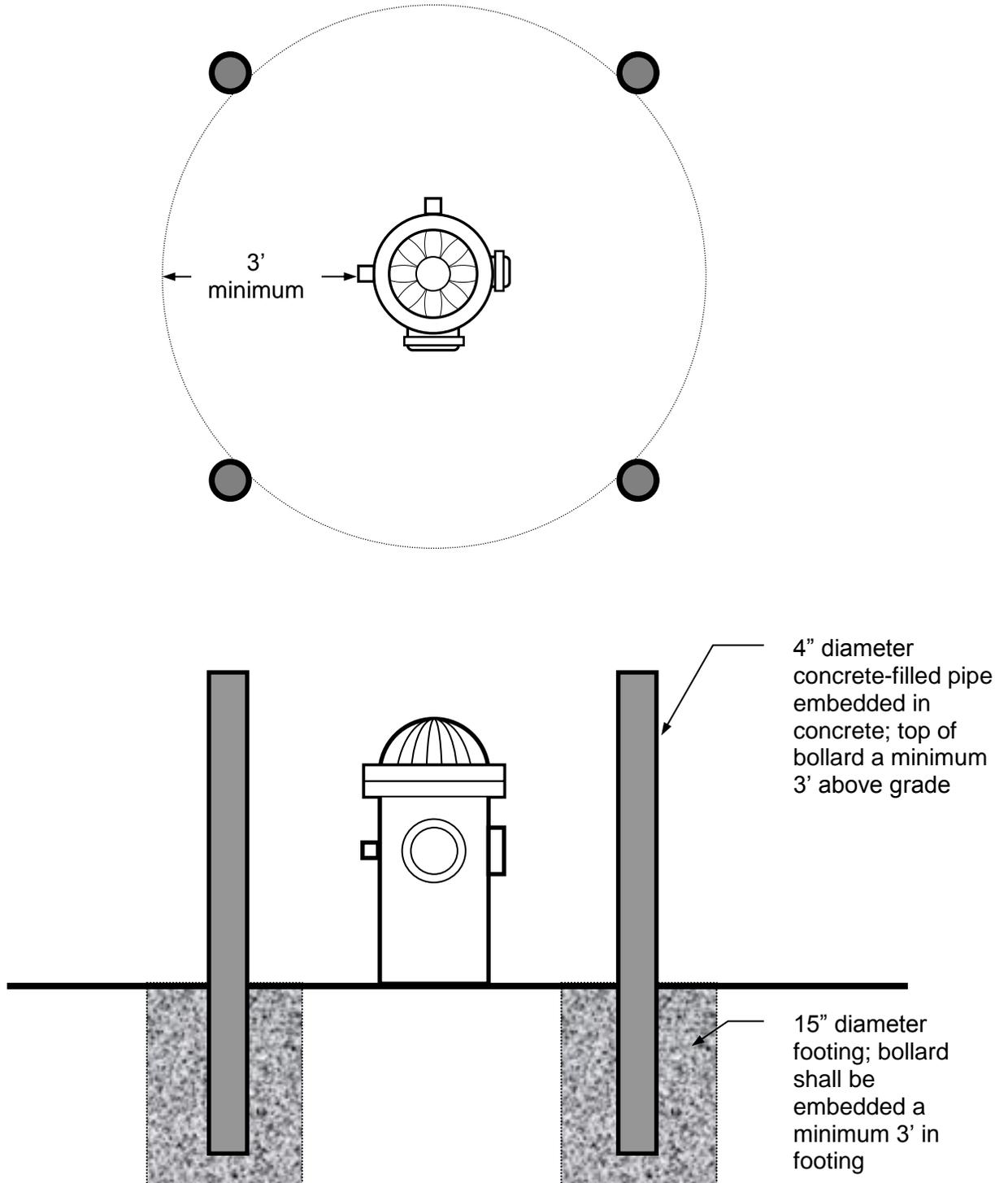
⁵ One hydrant for each 1,000 gallons per minute or fraction thereof.

⁶ The spacing between hydrants serving only detached sprinklered single family residences/duplexes may be increased to 600 feet.

⁷ The maximum distance to a hydrant serving a sprinklered detached single family residence/duplex may be increased to 300 feet.

ATTACHMENT 25

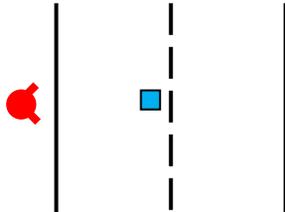
Protection of Hydrants, Detector Checks, Fire Department Connections, and other Appurtenances



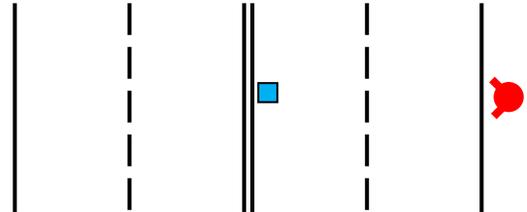
ATTACHMENT 26

Blue Dot Hydrant Marker Location

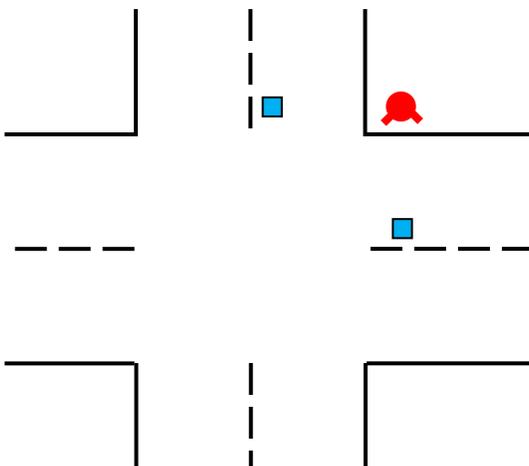
TWO LANE STREET



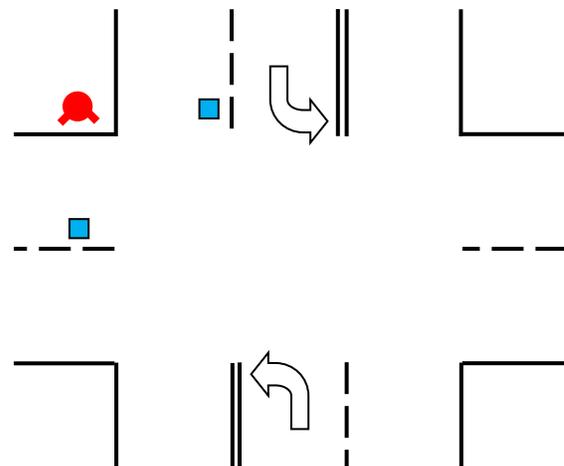
MULTI-LANE STREET



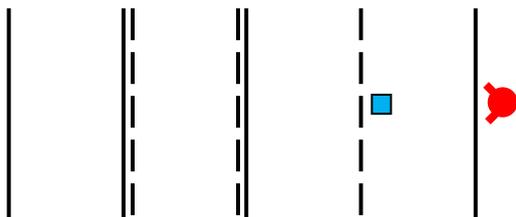
INTERSECTION



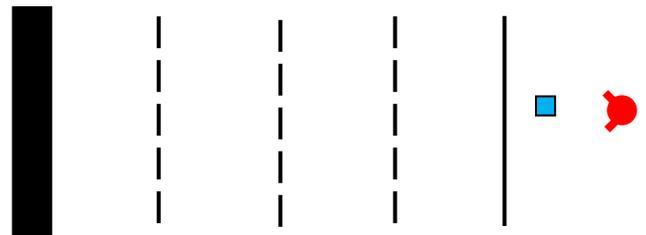
INTERSECTION WITH TURN LANES



MULTILANE STREET WITH TURN LANE



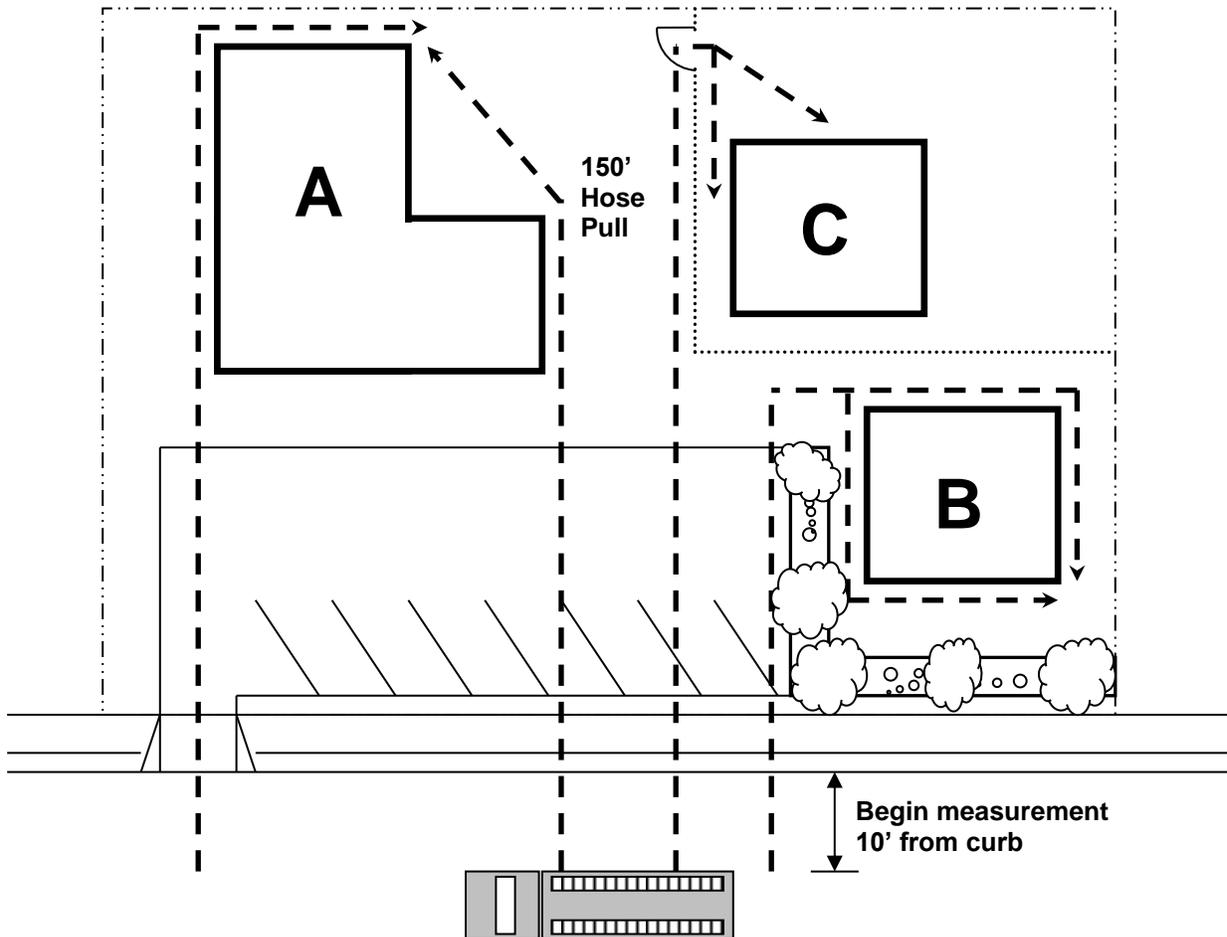
FREEWAYS AND EXPRESSWAYS



The developer may contact the local water company to arrange the installation of the blue dots. If the water agency does not participate in the blue dot program, the developer is still responsible to install the dots in an approved manner.

ATTACHMENT 27

Hose Pull



In the example above, assume that the parking lot is not accessible to fire apparatus due to turning radii and fire lane widths less than the required minimums.

- All portions of building “A” are within 150’ feet of the public road as measured along the path of firefighter travel. This building is in access.
- Building “B” is also in access despite the obstruction presented by the planter and hedges.
- Building “C” is out of access; the presence of a chainlink fence forces firefighters to backtrack once they pass through the gate, increasing their travel distance beyond 150’. On-site fire access roadways or a change in the location of the gate and would be necessary to provide access to Building “C”.

ATTACHMENT 28

Requirements for Key boxes/Key switches by Jurisdiction

This table is provided for purposes of facilitating sharing of key boxes/key switches for emergency access and security purposes by fire and police departments. It is not intended to be comprehensive or in any way supersede the requirements of the local jurisdiction; please refer to the local municipal or security code to verify the exact location of where devices are required for police access and other installation specifications. For fire department Knox device requirements, please see Sections 5.E through 5.G of this guideline for vehicle gates crossing fire lanes and Section 9.C.3 for pedestrian gates and buildings.

		IRVINE ^{1,2}	OCFA ¹	OTHER JURISDICTIONS ¹
Vehicular	Parking Structures	Irvine Uniform Security Code Section 5-9-519	See Section 9.C.3 of this guideline	See local municipal or security code
	Vehicle Gates	Irvine Uniform Security Code Section 5-9-519	See Section 5.E through 5.G of this guideline	
	Other	n/a		
Residential	Residential recreation areas >5 units	Irvine Uniform Security Code Section 5-9-519	See Section 9.C.3 of this guideline	See local municipal or security code
	Common interior/exterior circulation walkways and hallways >3 units	Irvine Uniform Security Code Section 5-9-519		
	Other	n/a		
Commercial/Industrial	Main entry of enclosed retail shopping centers	Irvine Uniform Security Code Section 5-9-519	See Section 9.C.3 of this guideline	See local municipal or security code
	Main entry of multi-tenant commercial/industrial structures	Irvine Uniform Security Code Section 5-9-519		
	Pedestrian gates to common exterior areas	Irvine Uniform Security Code Section 5-9-519		
	Other	n/a		

¹ Where additional devices beyond those required by the fire department are called for in the local municipal or security code, they shall also be accessible for use by the fire department to facilitate emergency response.

² Knox boxes and key switches serving pedestrian gates and buildings shall be located four feet above ground and within two feet of the strike side of the door. Refer to the Irvine Uniform Security Code, Section 5-9-519 for specific requirements for devices serving electric vehicle and pedestrian gates.

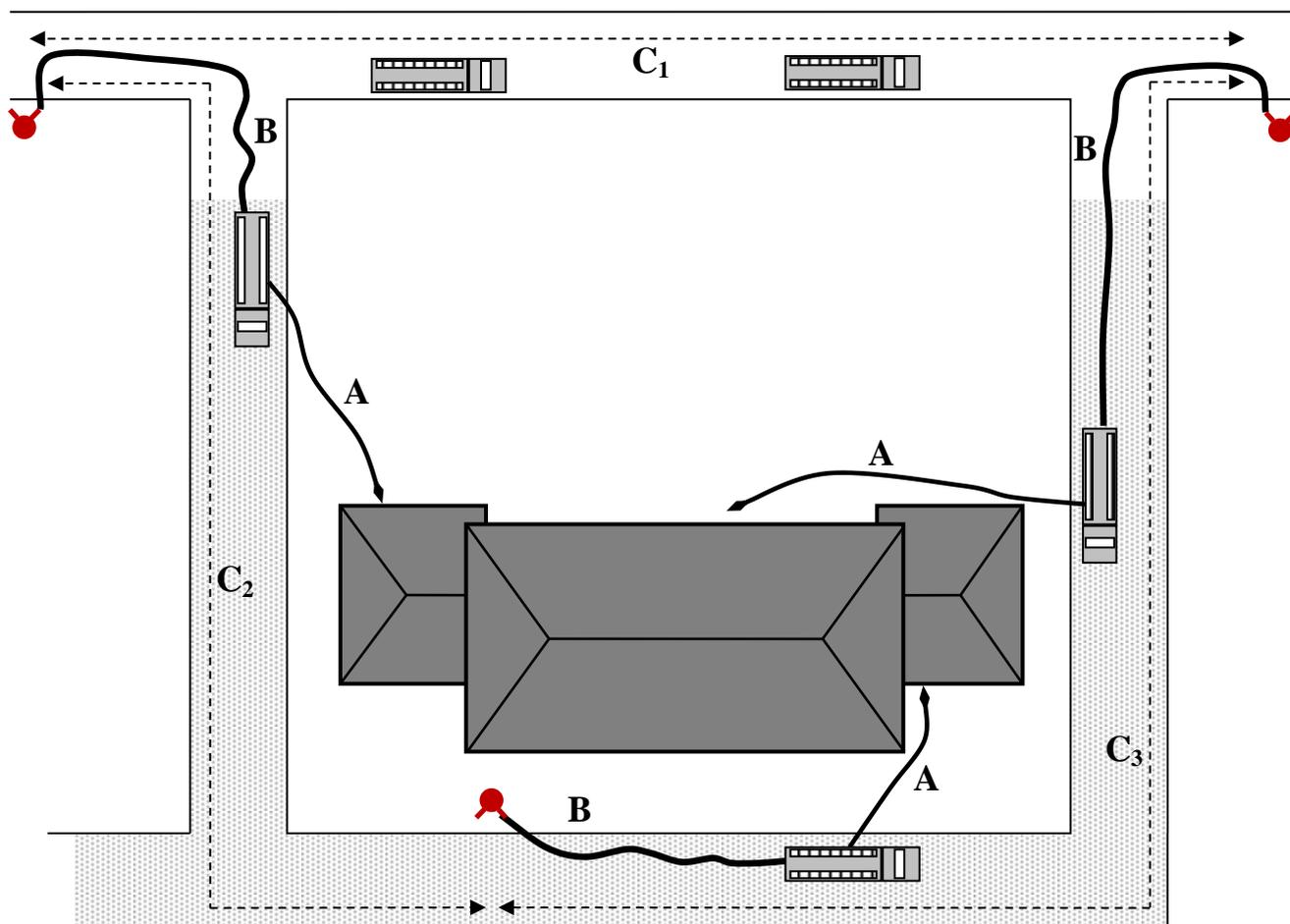
ATTACHMENT 29

Distance from Hydrant to Engine/Engine to Building/Between Hydrants

A: Hose Pull (Distance from Engine to Building): Represents the amount of fire hose that firefighters must pull from the engine to reach the structure. Hose pull may not exceed 150' from the apparatus to the most remote point of the perimeter of the structure, or for sprinklered detached single family homes and duplexes 300' to the front door. *Hose pull is measured along the firefighter path of travel, avoiding any obstacles, not "as the crow flies."* In the diagram below, firefighters would be able to reach the entire perimeter of the building by pulling no more than 150' of hose from one or more fire engines staged in the shaded portion of the fire lane; the engine in the unshaded roadway has a hose pull distance greater than 150' and the building would be considered "out of access" from that point. For hydrant evaluation purposes, the shaded part of the fire lane is considered to serve the building and must meet hose lay requirements. See Attachment 27 for further information on hose pull measurement and access to structures.

B: Hose Lay (Distance from Engine to a Hydrant): Represents the amount of hose that must be laid out of the engine to supply water to the engine from the hydrant. No point along the portion of the fire lane serving the structure (the shaded road) may be farther from a hydrant than the distance specified under "Maximum Distance" in CFC Table C105.1 (see Attachment 24). The hydrant may be located along portions of the fire lane that exceed the hose pull distance (unshaded roadway) provided that it is 1) on the same property, 2) on an adjacent property where an emergency access easement has been obtained, or 3) on a public road leading to the fire lane serving the property. *Hose lay is measured along the vehicle path of travel in the fire lane, not "as the crow flies."*

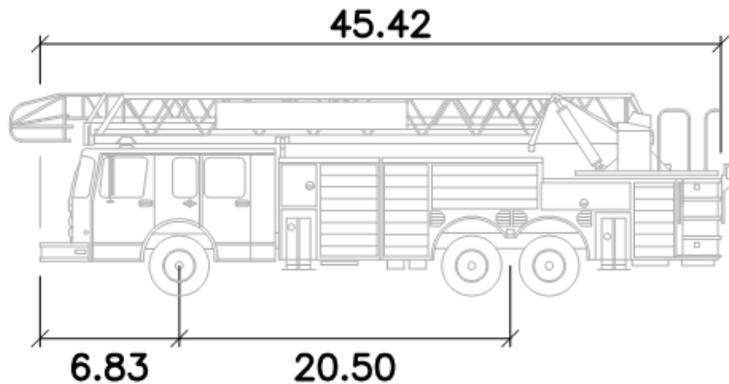
C: Hydrant Spacing (Distance between Hydrants)—the distance between hydrants serving the building shall not exceed twice the "Maximum Distance" listed in CFC Table C105.1, as measured along the fire lane. Hydrants located on portions of the fire lane that do not serve the building do not need to be evaluated for spacing relative to each other, only with respect to hydrants that do serve the structure. For example, when evaluating hydrant placement for the building shown in the diagram below, C₁ may exceed the hydrant spacing requirements, while C₂ and C₃ cannot. The "Average Spacing" from Table C105.1 shall be maintained to prevent multiple hydrants from being concentrated in only one portion of the fire lane.



ATTACHMENT 30

Apparatus Data for Swept Path Analysis

Use the following inputs for analyzing the swept path of a “typical” OCFA fire truck. To improve maneuverability for *all* OCFA apparatus, increase the speed of apparatus navigation through tight turns, and reduce the potential for property damage and resulting delays to emergency response projections such as light poles, sign posts, mailboxes, planter walls, and vegetation shall not be placed near the edge of the fire lane where they can obstruct or be struck by portions of the vehicle that may overhang the curb.



Width (cab)	8.00 feet
Width (mirror to mirror)	9.50 feet
Track (wheel)	8.50 feet
Lock to Lock Time	6 seconds
Steering Angle	40 degrees
Height Clearance	13.50 feet

ORANGE COUNTY FIRE AUTHORITY

Planning & Development Services Section

1 Fire Authority Road, Building A Irvine, CA 92602 714-573-6100 www.ocfa.org

Fire Safe Development in State Responsibility Areas



Guideline B-09a

Effective Date: January 1, 2016

Serving the Cities of: Aliso Viejo • Buena Park • Cypress • Dana Point • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods • Lake Forest • La Palma • Los Alamitos • Mission Viejo • Placentia • Rancho Santa Margarita • San Clemente • San Juan Capistrano • Seal Beach • Santa Ana • Stanton • Tustin • Villa Park • Westminster • Yorba Linda • and Unincorporated Areas of Orange County

Guideline B-09a: Fire Safe Development in State Responsibility Areas

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Guideline B-09a: Fire Safe Development in State Responsibility Areas

PURPOSE

This Guideline applies to new, remodeled, reconstructed, or relocated residential or commercial structures and developments and other facilities *located within State Responsibility Area (SRA) lands* for which emergency firefighting response or evacuation may be necessary.

Section 4290 of the Public Resources Code requires the Board of Forestry and Fire Protection to “adopt regulations implementing minimum fire safety standards related to defensible spaces which are applicable to state responsibility area lands under the authority of the department.” This statute is further clarified and made specific in regulation in Title 14, the Natural Resources Division of the California Code of Regulations.

In some cases, state regulations governing development within state responsibility areas (SRA) in Title 14 are more stringent than local standards enforced by OCFA based on the California Fire Code. In such cases, the more stringent state regulation would take precedence. Conversely, where the local regulation is more stringent and has been certified by the Board of Forestry and Fire Protection, it would take precedence over the state regulation.

Guideline B-09a is intended to assist the applicant in attaining compliance with both local and statewide requirements for projects within SRA land and is intended to be used *in conjunction with and not in place of* Guideline B-09. The text of Title 14 pertaining to access and water requirements for fire safe development has been reproduced in this Guideline and, where relevant, comments have been provided in a box after each Title 14 requirement. The comments may direct you to a more stringent local requirement where conflicting requirements exist, direct you to comply with a combination of state and local requirements where requirements are compatible or supplementary, or refer you to other codes or standards for additional guidance.

It is incumbent upon the developer and owner, and his/her agents and representatives, to ensure that projects comply with the requirements of all Authorities Having Jurisdiction. Nothing in this Guideline or Guideline B-09 is intended to abrogate the authority of CAL FIRE to enforce state regulations independently from or in addition to local design standards.

CALIFORNIA BOARD OF FORESTRY AND FIRE PROTECTION

SRA FIRE SAFE REGULATIONS



As of January 1, 2016

California Code of Regulations
Title 14 Natural Resources
Division 1.5 Department of Forestry
Chapter 7 - Fire Protection
Subchapter 2 SRA Fire Safe Regulations
Article 1 | Article 2 | Article 3 | Article 4 | Article 5 | Index

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- § 1270.00. Title
- § 1270.01. Purpose
- § 1270.02. Scope
- § 1270.03. Local Ordinances
- § 1270.04. Provisions for Application of these Regulations
- § 1270.05. Inspection Authority
- § 1270.06. Inspections
- § 1270.07. Exceptions to Standards
- § 1270.08. Request for Exceptions
- § 1270.09. Appeals
- § 1271.00. Definitions
- § 1271.05. Distance Measurements
- § 1272.00. Maintenance of Defensible Space Measures

ARTICLE 2. EMERGENCY ACCESS AND EGRESS

- § 1273.00. Intent
- § 1273.01. Road Width
- § 1273.02. Roadway Surface
- § 1273.03. Roadway Grades
- § 1273.04. Roadway Radius
- § 1273.05. Roadway Turnarounds
- § 1273.06. Roadway Turnouts
- § 1273.07. Roadway Structures
- § 1273.08. One-Way Roads
- § 1273.09. Dead-End Roads
- § 1273.10. Driveways
- § 1273.11. Gate Entrances

ARTICLE 3. SIGNING AND BUILDING NUMBERING

- § 1274.00. Intent
- § 1274.01. Size of Letters, Numbers and Symbols for Street and Roads Signs
- § 1274.02. Visibility and Legibility of Street and Road Signs
- § 1274.03. Height of Street and Road Signs
- § 1274.04. Names and Numbers on Street and Road Signs
- § 1274.05. Intersecting Roads, Streets and Private Lanes
- § 1274.06. Signs Identifying Traffic Access Limitations
- § 1274.07. Installation of Road, Street and Private Lane Signs
- § 1274.08. Addresses for Buildings
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ARTICLE 4. EMERGENCY WATER STANDARDS

- § 1275.00. Intent
- § 1275.01. Application
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ARTICLE 5. FUEL MODIFICATION STANDARDS

- § 1276.00. Intent
- § 1276.01. Setback for Structure Defensible Space
- § 1276.02. Disposal of Flammable Vegetation and Fuels
- § 1276.03. Greenbelts

Authority cited

NOTE: Authority cited: Section 4290, Public Resources Code. Reference: Sections 4290 and 4291, Public Resources Code.

History

1. New sections filed 5/30/91; operative 5/30/91 pursuant to Government Code section 11346.2(d) (Register 91, No.27)
2. Amendments filed 1-31-2013; operative 4-1-2013 (Register 2013, No. 5)
3. Amendments filed 4-27-2015; operative 1-1-2016 (Register 2015, No. 18)

ARTICLE 1. ADMINISTRATION

- § 1270.00. Title
- § 1270.01. Purpose
- § 1270.02. Scope
- § 1270.03. Local Ordinances
- § 1270.04. Provisions for Application of these Regulations
- § 1270.05. Inspection Authority
- § 1270.06. Inspections
- § 1270.07. Exceptions to Standards
- § 1270.08. Request for Exceptions
- § 1270.09. Appeals
- § 1271.00. Definitions
- § 1271.05. Distance Measurements
- § 1272.00. Maintenance of Defensible Space Measures

1270.00. Title

These regulations shall be known as "SRA Fire Safe Regulations," and shall constitute the basic wildland fire protection standards of the California Board of Forestry.

1270.01. Purpose

These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in SRA. A local jurisdiction may petition the Board for certification pursuant to section 1270.03. Where Board certification has not been granted, these regulations shall become effective September 1, 1991. The future design and construction of structures, subdivisions and developments in State Responsibility Area (SRA) shall provide for basic emergency access and perimeter wildfire protection measures as specified in the following articles. These measures shall provide for emergency access; signing and building numbering; private water supply reserves for emergency fire use; and vegetation modification. The fire protection standards which follow shall specify the minimums for such measures.

1270.02. Scope

(a) These regulations shall apply to:

- (1) the perimeters and access to all residential, commercial, and industrial building construction within SRA approved after January 1, 1991 except as set forth below in subsection b.);
- (2) all tentative and parcel maps or other developments approved after January 1, 1991; and
- (3) applications for building permits on a parcel approved in a pre-1991 parcel or tentative map to the extent that conditions relating to the perimeters and access to the buildings were not imposed as part of the approval of the parcel or tentative map.

(b) These regulations do not apply where an application for a building permit is filed after January 1, 1991 for building construction on a parcel that was formed from a parcel map or tentative map (if the final map for the tentative map is approved within the time prescribed by the local ordinance) approved prior to January 1, 1991, to the extent that conditions relating to the perimeters and access to the buildings were imposed by the parcel map or final tentative map approved prior to January 1, 1991.

(c) Affected activities include, but are not limited to:

- (1) permitting or approval of new parcels, excluding lot line adjustments as specified in Government Code (GC) section 66412(d),
- (2) application for a building permit for new construction, not relating to an existing structure,
- (3) application for a use permit,
- (4) the siting of manufactured homes (manufactured homes are as defined by the National Fire Protection Association, National Fire Code, section 501A, Standard for Fire Safety Criteria for Manufactured Home Installations, Sites and Communities, chapter 1, section 1-2, Definitions, page 4, 1987 edition and Health and Safety Code sections 18007, 18008, and 19971).
- (5) road construction, including construction of a road that does not currently exist, or extension of an existing road.

(d) EXEMPTION: Roads used solely for agricultural or mining use and roads used solely for the management and harvesting of wood products.

1270.03. Local Ordinances

Nothing contained in these regulations shall be considered as abrogating the provisions of any ordinance, rule or regulation of any state or local jurisdiction providing such ordinance, rule, regulation or general plan element is equal to or more stringent than these minimum standards. The Board may certify local ordinances as equaling or exceeding these regulations when they provide the same practical effect. The Board's certification of local ordinances pursuant to this section is rendered invalid when previously certified ordinances are subsequently amended by local jurisdictions without Board re-certification of the amended ordinances. The Board's regulations supersede the amended local ordinance(s) when the amended local ordinance(s) are not re-certified by the Board. Amendments made by local jurisdictions to previously certified ordinances shall be re-certified as described in 14 CCR §§ 1270.01 and 1270.03.

1270.04. Provisions for Application of these Regulations

This subchapter shall be applied as follows:

- (a) local jurisdictions shall provide the Director with notice of applications for building permits, tentative parcel maps, tentative maps, and use permits for construction or development within SRA.
- (b) the Director shall review and make fire protection recommendations on applicable construction or development or maps provided by the local jurisdiction.
- (c) the local jurisdiction shall ensure that the applicable sections of this subchapter become a condition of approval of any applicable construction or development permit or map.

1270.05. Inspection Authority

- (a) Inspection shall be made pursuant to section 1270.06 by:
 - (1) the Director, or
 - (2) local jurisdictions that have assumed state fire protection responsibility on SRA lands, or
 - (3) local jurisdictions where these regulations have been incorporated verbatim into that jurisdiction's building permit or subdivision approval process and the inspection duties have been formally delegated by CAL FIRE to the local jurisdiction, or
 - (4) local jurisdictions where the local ordinances have been certified pursuant to 14 CCR §§ 1270.01 and 1270.03 and the inspection duties have been formally delegated by CAL FIRE to the local jurisdiction.
- (b) Nothing in this section abrogates CAL FIRE's authority to inspect and enforce state forest and fire laws even when the inspection duties have been delegated pursuant to this section.
- (c) Reports of violations shall be provided to the CAL FIRE Unit headquarters that administers SRA fire protection in the local jurisdiction.

1270.06. Inspections

The inspection entity listed in 14 CCR 1270.05 may inspect for compliance with these regulations. When inspections are conducted, they should occur prior to: the issuance of the use permit; certificate of occupancy; the recordation of the parcel map or final map; the filing of a notice of completion; or the final inspection of any project or building permit.

1270.07. Exceptions to Standards

Upon request by the applicant, exceptions to standards within this subchapter or local jurisdiction certified ordinances may be allowed by the inspection entity listed in 14 CCR 1270.05, where the exceptions provide the same overall practical effect as these regulations towards providing defensible space. Exceptions granted by the inspection entity listed in 14 CCR 1270.05 shall be made on a case-by-case basis only. Exceptions granted by the inspection entity listed in 14 CCR 1270.05 shall be forwarded to the appropriate CAL FIRE Unit Office that administers SRA fire protection in that county and shall be retained on file at the Unit Office.

1270.08. Request for Exceptions

Requests for an exception shall be made in writing to the inspection entity listed in 14 CCR 1270.05 by the applicant or the applicant's authorized representative. The request shall state the specific section(s) for which an exception is requested, material facts supporting the contention of the applicant, the details of the exception proposed, and a map showing the proposed location and siting of the exception.

1270.09. Appeals

Where an exception is not granted by the inspection authority, the applicant may appeal such denial to the local jurisdiction. The local jurisdiction may establish or utilize an appeal process consistent with existing local building or planning department appeal processes.

Before the local jurisdiction makes a determination on an appeal, the inspection authority shall be consulted and shall provide to that local jurisdiction documentation outlining the effects of the requested exception on wildland fire protection.

If an appeal is granted, the local jurisdiction shall make findings that the decision meets the intent of providing defensible space consistent with these regulations. Such findings shall include a statement of reasons for the decision. A written copy of these findings shall be provided to the CAL FIRE Unit headquarters that administers SRA fire protection in that local jurisdiction.

1271.00. Definitions

Accessory building: Any building used as an accessory to residential, commercial, recreational, industrial, or educational purposes as defined in the California Building Code, 1989 Amendments, Chapter 11, Group M, Division 1 Occupancy that requires a building permit.

Agriculture: Land used for agricultural purposes as defined in a local jurisdiction's zoning ordinances.

Building: Any structure used or intended for supporting or sheltering any use of occupancy that is defined in the California Building Code, 1989 Amendments, Chapter 11, except Group M, Division 1, Occupancy. For the purposes of this subchapter, building includes mobile homes and manufactured homes, churches, and day care facilities.

CDF: California Department of Forestry and Fire Protection.

Dead-end road: A road that has only one point of vehicular ingress/egress, including cul-de-sacs and looped roads.

Defensible space: The area within the perimeter of a parcel, development, neighborhood or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an

approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter as used in this regulation is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures.

Development: As defined in Section 66418.1 of the California Government Code.

Director: Director of the Department of Forestry and Fire Protection or his/her designee.

Driveway: A vehicular access that serves no more than two buildings, with no more than three dwelling units on a single parcel, and any number of accessory buildings.

Dwelling unit: Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and/or sanitation for not more than one family.

Exception: An alternative to the specified standard requested by the applicant that may be necessary due to health, safety, environmental conditions, physical site limitations or other limiting conditions such as recorded historical sites, that provide mitigation of the problem.

Fire valve: See hydrant.

Fuel modification area: An area where the volume of flammable vegetation has been reduced, providing reduced fire intensity and duration.

Greenbelts: A facility or land-use, designed for a use other than fire protection, which will slow or resist the spread of a wildfire. Includes parking lots, irrigated or landscaped areas, golf courses, parks, playgrounds, maintained vineyards, orchards or annual crops that do not cure in the field.

Hammerhead/T: A roadway that provides a "T" shaped, three-point turnaround space for emergency equipment, being no narrower than the road that serves it.

Hydrant: A valved connection on a water supply/storage system, having at least one 2 1/2 inch outlet, with male American National Fire Hose Screw Threads (NH) used to supply fire apparatus and hoses with water.

Local Jurisdiction: Any county, city/county agency or department, or any locally authorized district that issues or approves building permits, use permits, tentative maps or tentative parcel maps, or has authority to regulate development and construction activity.

Occupancy: The purpose for which a building, or part thereof, is used or intended to be used.

One-way road: A minimum of one traffic lane width designed for traffic flow in one direction only.

Roads, streets, private lanes: Vehicular access to more than one parcel; access to any industrial or commercial occupancy; or vehicular access to a single parcel with more than two buildings or four or more dwelling units.

Roadway: Any surface designed, improved, or ordinarily used for vehicle travel.

Roadway structures: Bridges, culverts, and other appurtenant structures which supplement the roadway bed or shoulders.

Same Practical Effect: As used in this subchapter means an exception or alternative with the capability of applying accepted wildland fire suppression strategies and tactics, and provisions for fire fighter safety, including:

- (a) access for emergency wildland fire equipment,
- (b) safe civilian evacuation,
- (c) signing that avoids delays in emergency equipment response,
- (d) available and accessible water to effectively attack wildfire or defend a structure from wildfire, and
- (e) fuel modification sufficient for civilian and fire fighter safety.

State Board of Forestry (SBOF): A nine member board, appointed by the Governor, which is responsible for developing the general forest policy of the state, for determining the guidance policies of the Department of Forestry and Fire Protection, and for representing the state's interest in federal land in California.

State Responsibility Area (SRA): As defined in the Public Resources Code section 4126-4127; and the California Code of Regulations, Title 14, Division 1.5, Chapter 7, Article 1, Sections 1220-1220.5.

Structure: That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

Subdivision: As defined in Section 66424 of the Government Code.

Traffic lane: The portion of a roadway that provides a single line of vehicle travel.

Turnaround: A roadway, unobstructed by parking, which allows for a safe opposite change of direction for emergency equipment. Design of such area may be a hammerhead/T or terminus bulb.

Turnouts: A widening in a roadway to allow vehicles to pass.

Vertical clearance: The minimum specified height of a bridge or overhead projection above the roadway.

Wildfire: As defined in Public Resources Code Section 4103 and 4104.

See also definitions provided in the "Scope" section of OCFA Guideline B-09 and Chapter 2 of the California Fire Code.

1271.05. Distance Measurements

All specified or referenced distances are measured along the ground, unless otherwise stated.

1272.00. Maintenance of Defensible Space Measures

To ensure continued maintenance of properties in conformance with these standards and measures and to assure continue availability, access, and utilization of the defensible space provided for these standards during a wildfire, provisions for annual maintenance shall be included in the development plans and/or shall be provided as a condition of the permit, parcel or map approval.

ARTICLE 2. EMERGENCY ACCESS AND EGRESS

- § 1273.00. Intent
- § 1273.01. Road Width
- § 1273.02. Roadway Surface
- § 1273.03. Roadway Grades
- § 1273.04. Roadway Radius
- § 1273.05. Roadway Turnarounds
- § 1273.06. Roadway Turnouts
- § 1273.07. Roadway Structures
- § 1273.08. One-Way Roads
- § 1273.09. Dead-End Roads
- § 1273.10. Driveways
- § 1273.11. Gate Entrances

1273.00. Intent

Road and street networks, whether public or private, unless exempted under section 1270.02(e), shall provide for safe access for emergency wildland fire equipment and civilian evacuation concurrently, and shall provide unobstructed traffic circulation during a wildfire emergency consistent with Sections 1273.00 through 1273.11.

1273.01. Road Width

All roads shall be constructed to provide a minimum of two ten (10) foot traffic lanes, not including shoulder and striping. These traffic lanes shall provide for two-way traffic flow to support emergency vehicle and civilian egress, unless other standards are provided in this article, or additional requirements are mandated by local jurisdictions or local subdivision requirements.

Guideline B-09 Section 2.A.4:

In Hazardous Fire Areas, fire lanes shall be at least 28 feet wide.

Exception: fire lanes that are 150 feet or less in length may be 24 feet wide if serving one to three dwelling units; where all structures served by the fire lane are protected with fire sprinklers, this length may be increased to 400 feet.

This width shall be provided to a logical termination outside of the Hazardous Fire Area. Refer to the Fire Hazard Severity Zone/Special Fire Protection Area maps on the OCFA website.

1273.02. Roadway Surface

Roadways shall be designed and maintained to support the imposed load of fire apparatus weighing at least 75,000 pounds and provide an aggregate base. Project proponent shall provide engineering specifications to support design, if requested by the local authority having jurisdiction.

In SRA areas, roads shall comply with the more stringent state requirement of 75,000 pounds.

1273.03. Roadway Grades

The grade for all roads, streets, private lanes and driveways shall not exceed 16 percent.

Guideline B-09 Section 2.A.7:

Fire Apparatus Access Road Grade - The grade for access roads shall not exceed 10% or 5.7 degrees (7% or 4 degrees in Irvine unless otherwise approved by the City Engineer). The grade may be increased to a maximum of 15% or 8.5 degrees for approved lengths of access roadways, when all structures served by the access road are protected by automatic fire sprinkler systems. Cross-slope shall not be greater than 2% for paved access roadways.

1273.04. Roadway Radius

(a) No roadway shall have a horizontal inside radius of curvature of less than 50 feet and additional surface width of 4 feet shall be added to curves of 50-100 feet radius; 2 feet to those from 100-200 feet.

(b) The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water, shall be not less than 100 feet.

Guideline B-09 Section 2.A.7:

Cross-slope shall not be greater than 2% for paved access roadways.

1273.05. Roadway Turnarounds

Turnarounds are required on driveways and dead-end roads. The minimum turning radius for a turnaround shall be forty (40) feet, not including parking, in accordance with the following figure. If a hammerhead/T is used instead, the top of the "T" shall be a minimum of sixty (60) feet in length.

See also Guideline B-09 Attachment 7. Circular and hammerhead turnarounds shall meet the more stringent minimum requirements of CAL FIRE and OCFA. For example, a circular turnaround would need a 40' outer radius (per CAL FIRE) and a 28' radius where the "bulb" connects to the 20' wide "neck."

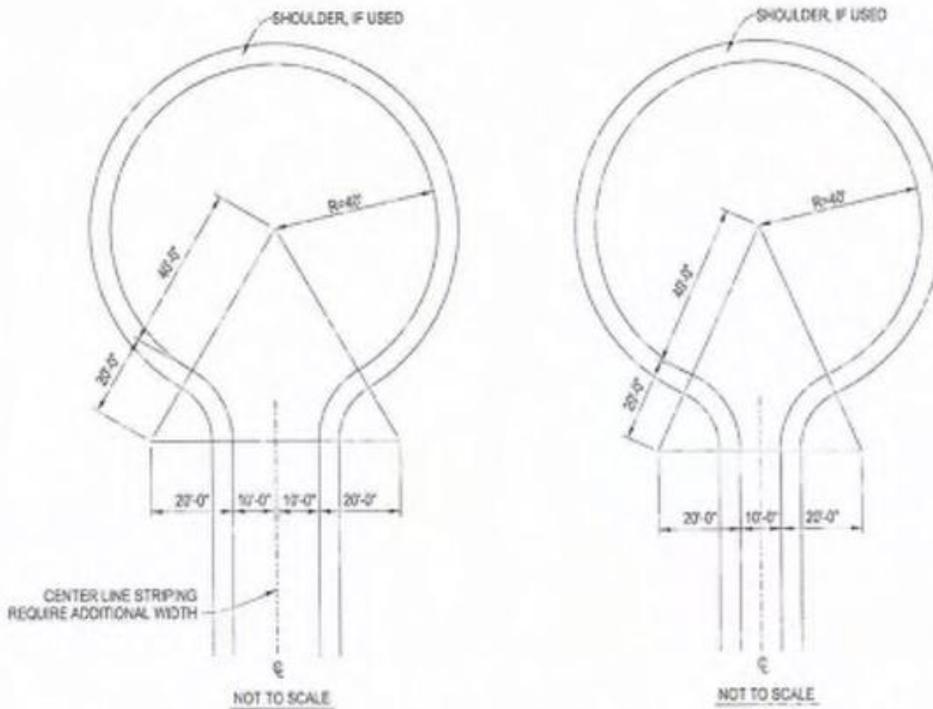
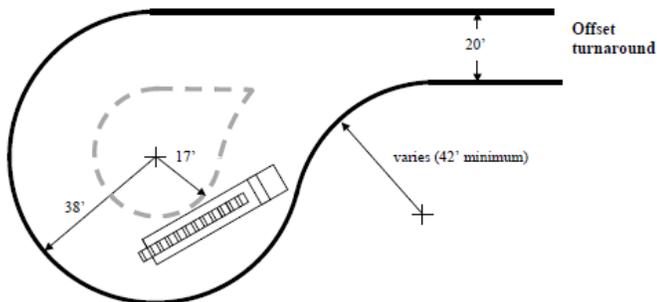
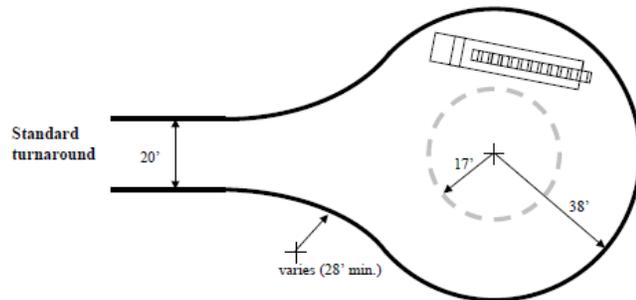


FIGURE FOR 14 CCR § 1273.05. TURNAROUND EXAMPLES

ATTACHMENT 7
Minimum Turnaround and Hammerhead Dimensions



1273.06. Roadway Turnouts

Turnouts shall be a minimum of twelve (12) feet wide and thirty (30) feet long with a minimum twenty-five (25) foot taper on each end.

Turnouts intended only for passage of vehicles shall be 12 feet wide by 50 feet long to accommodate OCFA apparatus. Where the turnout also functions as a staging area for firefighting, the width shall be increased to 16 feet. Please refer to the access section in Guideline H-01 for additional considerations regarding turnouts used for firefighting.

1273.07. Roadway Structures

(a) All driveway, road, street, and private lane roadway structures shall be constructed to carry at least the maximum load and provide the minimum vertical clearance as required by Vehicle Code Sections 35250, 35550, and 35750.

(b) Appropriate signing, including but not limited to weight or vertical clearance limitations, one-way road or single lane conditions, shall reflect the capability of each bridge.

(c) Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with the American Association of State and Highway Transportation Officials Standard Specifications for Highway Bridges, 17th Edition, published 2002 (known as AASHTO HB-17), hereby incorporated by reference. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the local authority having jurisdiction. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, barriers, or signs, or both, as approved by the local authority having jurisdiction, shall be installed and maintained. A bridge with only one traffic lane may be authorized by the local jurisdiction; however, it shall provide for unobstructed visibility from one end to the other and turnouts at both ends.

1273.08. One-Way Roads

All one-way roads shall be constructed to provide a minimum, not including shoulders, of one twelve (12) foot traffic lane. The local jurisdiction may approve one-way roads. All one-way roads shall connect to a two-lane roadway at both ends, and shall provide access to an area currently zoned for no more than ten (10) dwelling units. In no case shall it exceed 2,640 feet in length. A turnout shall be placed and constructed at approximately the midpoint of each one-way road.

Where one-way roads are allowed by OCFA, they shall be a minimum of 13 feet wide, consistent with the minimum width allowed in OCFA Guideline B-09 Section 5.A for one-way fire lanes passing through gates.

1273.09. Dead-End Roads

(a) The maximum length of a dead-end road, including all dead-end roads accessed from the dead-end road, shall not exceed the following cumulative lengths, regardless of the numbers of parcels served:

- parcels zoned for less than one acre – 800 feet
- parcels zoned for 1 acre to 4.99 acres – 1320 feet
- parcels zoned for 5 acres to 19.99 acres – 2640 feet
- parcels zoned for 20 acres or larger – 5280 feet

All lengths shall be measured from the edge of the roadway surface at the intersection that begins the road to the end of the road surface at the intersection that begins the road to the end of the road surface at its farthest point. Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply.

(b) Where parcels are zoned 5 acres or larger, turnarounds shall be provided at a maximum of 1320 foot intervals.

(c) Each dead-end road shall have a turnaround constructed at its terminus.

Regardless of parcel size, dead-end fire lanes over 800 feet long shall have a mid-point turnaround or other approved form of mitigation per Guideline B-09 Section 2.A.9.

1273.10. Driveways

(a) All driveways shall be constructed to provide a minimum of one (1) ten (10) foot traffic lane and fourteen (14) feet unobstructed horizontal clearance and unobstructed vertical clearance of fifteen (15) feet.

(b) Driveways exceeding 150 feet in length, but less than 800 feet in length, shall provide a turnout near the midpoint of the driveway. Where the driveway exceeds 800 feet, turnouts shall be provided no more than 400 feet apart.

(c) A turnaround shall be provided to all building sites on driveways over 300 feet in length, and shall be within fifty (50) feet of the building.

Driveways that are designated fire lanes shall also comply with all applicable requirements in Guideline B-09 or the provisions of an approved alternate methods and materials proposal. In no case shall they be less stringent than Title 14.

1273.11. Gate Entrance

(a) Gate entrances shall be at least two (2) feet wider than the width of the traffic lane(s) serving that gate and a minimum width of fourteen (14) feet unobstructed horizontal clearance and unobstructed vertical clearance of fifteen (15) feet.

(b) All gates providing access from a road to a driveway shall be located at least thirty (30) feet from the roadway and shall open to allow a vehicle to stop without obstructing traffic on that road.

(c) Security gates shall not be installed without approval and where security gates are installed, they shall have an approved means of emergency operation. Approval shall be by the local authority having jurisdiction. The security gates and the emergency operation shall be maintained operational at all times.

(d) Where a one-way road with a single traffic lane provides access to a gated entrance, a forty (40) foot turning radius shall be used.

Gates crossing fire lanes shall comply with the most stringent requirements from Title 14 and B-09. For example, gates shall have a minimum clear opening of 15 feet when serving a single lane of traffic (13 foot minimum road width per B-09 plus an additional 2 feet of clearance per Title 14).

ARTICLE 3. SIGNING AND BUILDING NUMBERING

- § 1274.00. Intent
- § 1274.01. Size of Letters, Numbers and Symbols for Street and Roads Signs
- § 1274.02. Visibility and Legibility of Street and Road Signs
- § 1274.03. Height of Street and Road Signs
- § 1274.04. Names and Numbers on Street and Road Signs
- § 1274.05. Intersecting Roads, Streets and Private Lanes
- § 1274.06. Signs Identifying Traffic Access Limitations
- § 1274.07. Installation of Road, Street and Private Lane Signs
- § 1274.08. Addresses for Buildings
- § 1274.09. Size of Letters, Numbers and Symbols for Addresses
- § 1274.10. Installation, Location and Visibility of Addresses

1274.00. Intent

To facilitate locating a fire and to avoid delays in response, all newly constructed or approved roads, street, and buildings shall be designated by names or numbers, posted on signs clearly visible and legible from the roadway. This section shall not restrict the size of letters of numbers appearing on street signs for other purposes.

1274.01. Size of Letters, Numbers and Symbols for Street and Roads Signs

Size of letters, numbers, and symbols for street and road signs shall be a minimum 4 inch letter height, .5 inch stroke, reflectorized, contrasting with the background color of the sign.

1274.02. Visibility and Legibility of Street and Road Signs

Street and road signs shall be visible and legible from both directions of vehicle travel for a distance of at least 100 feet.

1274.03. Height of Street and Road Signs

Height of street and road signs shall be uniform county wide, and meet the visibility and legibility standards of this article.

1274.04. Names and Numbers on Street and Road Signs

Newly constructed or approved public and private roads and streets must be identified by a name or number through a consistent countywide system that provides for sequenced or patterned numbering and/or non-duplicating naming within each county. All signs shall be mounted and oriented in a uniform manner. This section does not require any entity to rename or renumber existing roads or streets, nor shall a roadway providing access only to a single commercial or industrial occupancy require naming or numbering.

1274.05. Intersecting Roads, Streets and Private Lanes

Signs required by this article identifying intersecting roads, streets and private lanes shall be placed at the intersection of those roads, streets, and/or private lanes.

1274.06. Signs Identifying Traffic Access Limitations

A sign identifying traffic access or flow limitations, including but not limited to weight or vertical clearance limitations, dead-end road, one-way road or single lane conditions, shall be placed:

- (a) at the intersection preceding the traffic access limitation, and
- (b) no more than 100 feet before such traffic access limitation.

1274.07. Installation of Road, Street and Private Lane Signs

Road, street and private lane signs required by this article shall be installed prior to final acceptance by the local jurisdiction of road improvements.

1274.08. Addresses for Buildings

All buildings shall be issued an address by the local jurisdiction which conforms to that jurisdiction's overall address system. Accessory buildings will not be required to have a separate address; however, each dwelling unit within a building shall be separately identified.

1274.09. Size of Letters, Numbers and Symbols for Addresses

Size of letters, numbers and symbols for addresses shall be a minimum 4 inch letter height, .5 inch stroke, reflectorized, contrasting with the background color of the sign.

Address identification shall be plainly legible and visible from the street or road fronting the property. Addresses shall be Arabic numbers or alphabetical letters. Where access is by means of a private road and the address identification cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the address.

OCFA Guideline B-09 Section 4.C

The numbers shall be a *minimum* of 4" in height for single-family homes/duplexes, or individual unit numbers in multi-family residential structures, and 6" or more for commercial structures or the primary building address or address range posted on multi-family residential structures. The 6" numbers shall have a 1" stroke. Building setbacks, elevation, and landscaping can affect these minimum size requirements.

1274.10. Installation, Location and Visibility of Addresses

(a) All buildings shall have a permanently posted address, which shall be placed at each driveway entrance and visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located.

(b) Address signs along one-way roads shall be visible from both the intended direction of travel and the opposite direction.

(c) Where multiple addresses are required at a single driveway, they shall be mounted on a single post.

(d) Where a roadway provides access solely to a single commercial or industrial business, the address sign shall be placed at the nearest road intersection providing access to that site.

ARTICLE 4. EMERGENCY WATER STANDARDS

- § 1275.00. Intent
- § 1275.01. Application
- § 1275.10. General Standards
- § 1275.15. Hydrant/Fire Valve
- § 1275.20. Signing of Water Sources

1275.00. Intent

Emergency water for wildfire protection shall be available, accessible, and maintained in quantities and locations specified in the statute and these regulations, in order to attack a wildfire or defend property from a wildfire.

1275.01. Application

The provisions of this article shall apply in the tentative and parcel map process when new parcels are approved by the local jurisdiction having authority. When a water supply for structure defense is required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except when alternative methods of protection are provided and approved by the local authority having jurisdiction.

1275.10. General Standards

Water systems that comply with the below standard or standards meet or exceed the intent of these regulations. Water systems equaling or exceeding the National Fire Protection Association (NFPA) 1142, "Standard on Water Supplies for Suburban and Rural Fire Fighting," 2012 Edition, hereby incorporated by reference, and California Fire Code, California Code of Regulations title 24, part 9, shall be accepted as meeting the requirements of this article. Such emergency water may be provided in a fire agency mobile water tender, or naturally occurring or man made containment structure, as long as the specified quantity is immediately available. Nothing in this article prohibits the combined storage of emergency wildfire and structural firefighting water supplies unless so prohibited by local ordinance or specified by the local fire agency. Where freeze protection is required by local jurisdictions having authority, such protection measures shall be provided.

1275.15. Hydrant/Fire Valve

(a) The hydrant or fire valve shall be eighteen (18) inches above grade, eight (8) feet from flammable vegetation, no closer than four (4) feet nor farther than twelve (12) feet from a roadway, and in a location where fire apparatus using it will not block the roadway.

The hydrant serving any building shall:

- (1) be not less than fifty (50) feet nor more than 1/2 mile by road from the building it is to serve, and
- (2) be located at a turnout or turnaround, along the driveway to that building or along the road that intersects with that driveway.

(b) The hydrant head shall be 2 1/2 inch National Hose male thread with cap for pressure and gravity flow systems and 4 1/2 inch draft systems. Such hydrants shall be wet or dry barrel as required by the delivery system. They shall have suitable crash protection as required by the local jurisdiction.

The hose lay distance to a hydrant shall not exceed 250' (or less, per CFC Appendix C) from the structure as measured along the fire lane fronting the structure. Please see Attachments 24 and 29 in Guideline B-09.

1275.20 Signing of Water Sources

Each hydrant/fire valve or access to water shall be identified as follows:

- (a) If located along a driveway, a reflectorized blue marker, with a minimum dimension of 3 inches shall be located on the driveway address sign and mounted on a fire retardant post, or
- (b) If located along a street or road,
 - (1) a reflectorized blue marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. The sign post shall be within 3 feet of said hydrant/fire valve, with the sign no less than 3 feet nor greater than 5 feet above ground, in a horizontal position and visible from the driveway, or
 - (2) as specified in the State Fire Marshal's Guidelines for Fire Hydrant Markings Along State Highways and Freeways, May 1988.

Paved roadways shall also have a "blue dot" reflector installed in the roadway in accordance with Section 8.E and Attachment 26 in Guideline B-09. Before placing any reflector on a state highway or freeway, the developer/owner shall obtain an encroachment permit from the Department of Transportation in accordance with Section 13060 of the Health and Safety Code.

ARTICLE 5. FUEL MODIFICATION STANDARDS

- § 1276.00. Intent
- § 1276.01. Setback for Structure Defensible Space
- § 1276.02. Disposal of Flammable Vegetation and Fuels
- § 1276.03. Greenbelts

1276.00 Intent

To reduce the intensity of a wildfire by reducing the volume and density of flammable vegetation, the strategic siting of fuel modification and greenbelt shall provide

- (1) increased safety for emergency fire equipment and evacuating civilians by its utilization around structures and roads, including driveways; and
- (2) a point of attack or defense from a wildfire.

1276.01 Setback for Structure Defensible Space

- (a) All parcels 1 acre and larger shall provide a minimum 30 foot setback for buildings and accessory buildings from all property lines and/or the center of the road.
- (b) For parcels less than 1 acre, the local jurisdiction shall provide for the same practical effect.

1276.02 Disposal of Flammable Vegetation and Fuels

Disposal, including chipping, burying, burning or removal to a landfill site approved by the local jurisdiction, of flammable vegetation and fuels caused by site development and construction, road and driveway construction, and fuel modification shall be completed prior to completion of road construction or final inspection of a building permit.

1276.03 Greenbelts

Subdivision and other developments, which propose greenbelts as a part of the development plan, shall locate said greenbelts strategically, as a separation between wildland fuels and structures. The locations shall be approved by the local authority having jurisdiction and may be consistent with the CAL FIRE Unit Fire Management Plan or Contract County Fire Plan.

Please see OCFA Guideline C-05 for Fuel Modification requirements.

ORANGE COUNTY FIRE AUTHORITY

Planning & Development Services Section

1 Fire Authority Road, Building A, Irvine, CA 92602 714-573-6100 www.ocfa.org

Vegetation Management Guideline

Technical Design for New Construction Fuel Modification Plans and Maintenance Program



Guideline C-05

Date: January 1, 2014

Serving the Cities of: Aliso Viejo • Buena Park • Cypress • Dana Point • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods • Lake Forest • La Palma • Los Alamitos • Mission Viejo • Placentia • Rancho Santa Margarita • Santa Ana • San Clemente • San Juan Capistrano • Seal Beach • Stanton • Tustin • Villa Park • Westminster • Yorba Linda • and Unincorporated Areas of Orange County

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INTRODUCTION

Proper vegetation management in areas at risk from wildfires has proven to be a major factor in reducing the chances of homes burning, especially when combined with exterior construction features designed or maintained to further protect a home from the approaching flames and embers. Over the past 35 years these two approaches have contributed to saving thousands of homes from igniting during wildfires in Orange County. Since the late 1970's, planning and building department agencies served by Orange County Fire Authority (OCFA) have adopted local fire codes to require that new buildings be protected by landscape Fuel Modification Zones.

Fuel Modification Zones are landscaping areas in which existing combustible vegetation is removed from strips of land and replaced with spaced and irrigated fire-resistant plants and further adjoining strips of land in which vegetation is partially removed. The zones provide an integral level of protection for structures from wildfires by slowing the speed and reducing the intensity of the fire.

PURPOSE

The purpose of this guideline is to provide information on how fuel modification zones are to be designed, installed, and maintained in order to meet safety requirements.

SCOPE

New construction development adjoining grass-covered, brush-covered or chaparral covered land, canyons, foothills, mountains, and other lands containing combustible vegetation requires fuel modification of natural vegetation at the urban interface and an assessment of interior vegetative areas within the community.

Vegetation Management practices are implemented and enforced in two ways; Fuel Modification and Defensible Space. Prior to beginning the grading and/or construction process, developers and builders are required to receive approval from OCFA for the design of a **Fuel Modification Plan** and for the installation of **Fuel Modification Zones**. Separately, the California Fire Code and Public Resources Code additionally requires land owners to implement and annually maintain a **Defensible Space** vegetation reduction activity between their structure and the wildfire area for a distance up to 100 feet, measured from their structure to their property line. Defensible Space is required for land owners in Orange County when a Fuel Modification plan and installation was not previously approved, and for their current remaining landscape area located between the approved Fuel Modification Zone "A" and their structure (See Attachment 2). Defensible Space maintenance information for can be found at www.readysetgooc.org.

This guideline C-05 addresses only the Fuel Modification design and maintenance process requirements.

SUBMITTAL CRITERIA REQUIREMENTS

Design of the Zones:

The minimum width of a fuel modification area is 170 feet (in some cases the width could be increased prior to approval, due to the type of terrain and/or type and mass of vegetation). Zone A will not be approved when separated more than 100 feet from the protected structure. A new fuel modification installation consists of: (See Attachment 2)

- 20-Foot Level Structure Setback (Zone A)
- 50-Foot Re-planted Irrigated (Zone B)
- 50-Foot Vegetation Thinning (Zone C)
- 50-Foot Vegetation Thinning (Zone D)
- An Assessment of Areas Interior from the Community Perimeter (Section 7)

NOTE: Fuel modification plans could require Special Maintenance Areas or upgraded construction features within communities located further from the edge of the community, based on the specific criteria noted in Section 7. Special Maintenance Areas should not normally be required to meet the requirements of a fuel modification zone, but approved plans would set forth site specific requirements for installation and maintenance of the areas if determined Special Maintenance Areas are required.

- Roadside vegetation protecting vital community evacuation systems.

The OCFA strongly encourages all project proponents to meet with OCFA staff prior to plan submittal to ensure an overall understanding of program scope and requirements during the design phase. Call 714-573-6100 to schedule an appointment.

Plan Submittal Criteria:

1. Conceptual Fuel Modification Plans

Conceptual plans are optional if the designer is already prepared to submit a precise plan (See Section 2 for the precise plan requirements). Conceptual plan criteria are required to be shown on the precise plans. Fuel modification plans must be approved by the OCFA Planning and Development Services Section. This approval occurs prior to, or concurrent with review and approval of any tentative tract map, tract map, or site grading permit, whichever comes first. (Refer to Section 10 for the timing of when fuel modification plans need to be approved).

Submit three sets of plans prepared by a licensed Landscape Architect or other design professional with equivalent credentials, for OCFA review. Contact OCFA in advance if not using a licensed landscape architect. Prior to final approval, an electronic copy of the plans is required in a .pdf format.

Required new construction inspections from Section 10 are not scheduled from the Conceptual Fuel Modification plans. To obtain a new construction inspection, a Precise Fuel Modification plan is required to be approved. If site meetings are needed, contact OCFA at 714-573-6100.

Conceptual Plan Criteria: (Conceptual criteria must also be on the Precise Fuel Modification plans)
The following information shall be included on the Conceptual Fuel Modification Plan:

- A. Delineate the width of each zone. Zones shall be scaled and symbolized with a brief description of each zone's dimensions and character;
- 20-Foot Zone A / Structure Setback on Level Ground
 - 50-Foot Zone B / Re-planted and Irrigated (*Ground cover is required in Zone B and should cover the entire ground between groups of shrubs, trees, or grasses. Ground cover shall not exceed 2 feet in height*).
 - 50-Foot Zone C / Thinning Area
 - 50-Foot Zone D / Thinning Area
- B. Submit Landscape Plans for Common Areas and Interior Slopes (Read Section 7)
Note: Fuel modification plans could require Special Maintenance Areas within communities, based on the specific criteria noted in Section 7. The plans shall:
- Show all interior commonly owned areas.
 - Describe where irrigated and non-irrigated.
 - Have a note stating that common area and interior slope plans will be submitted to OCFA for assessment, prior to design approval of other agencies and prior to the purchase and installation of the plants.
- C. Copy Sections 4, 5, and 6 on the plans under each specific zone listed above. Also, provide the name(s) of the entity that is responsible for maintenance of each zone.
- D. Identify the size of the development by showing all tract and property lines and slope contour lines. Show all structure footprints nearest to the fuel modification area.
- E. All 170 feet of fuel modification shall be located within the property or tract of the protected structure. Only as a last case scenario, label off-site fuel modification proposed outside the tract or property lines. In those extreme cases, provide easements or permanent legal agreements recorded with adjacent property owners. If allowed, the plans will not be approved until the recorded agreements are copied on the plans. (Refer to Section 8)
- F. Demonstrate that the designer, developer and future land owner are aware of the allowed plant species and spacing requirements by placing Attachment 6 and 7 on the plans.
- G. Show location of existing plant species you are proposing to retain within the fuel modification zones. (The plans shall note rare, protected, and endangered plant and animal species, tree ordinances, geological hazards, and other conflicting restrictions). Protected habitat is not allowed within the zones, as future maintenance would conflict with safety requirements herein and would be more difficult, costly, and problematic for landowners.
- H. Photographs of the area that show the type of vegetation that currently exists, including height and density, and the topography of the site.

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- I. Location of emergency and maintenance access easements on private or common property within every 500 lineal feet of the fuel modification area. Access easements shall have a minimum 10-foot width; alternatively, 5-foot wide easements provided every 250 feet may be acceptable. Gates shall be installed into the fuel modification area and shall be a minimum of 36 inches wide. The easements shall be maintained free of vegetation or any structures greater than 5 inches in height.
 - J. General descriptive notes of what exists 300 feet beyond the development property lines in all directions; i.e., reserve lands, future construction, existing adjacent structures, natural vegetation, roads, parks, etc.
 - K. A note stating that within the fuel modification zones, the plant species for the precise fuel modification plans will be selected from the OCFA approved plant palette Attachment 8.
 - L. When vital evacuation road systems are on the perimeter of the community and/or used as a fuel modification zone, the zone shall be adjusted to protect the road with a Fuel Modification Zone B on the opposite side of the road from the structures.
 - M. If you cannot meet the requirements of the fuel modification guideline for total distance of any or all zones, plant species, or horizontal spacing/grouping distances etc; an Alternative Materials and Methods (AM & M) request letter shall be drafted by the applicant and submitted with the plans. The AM & M will require approval of additional/multiple OCFA staff. The alternative proposal requires the burden of proof on the applicant to demonstrate the proposal is equivalent to the minimum code requirements. In extreme alternative proposal cases, fire behavior analysis reports by an experienced fire behavior expert could be required by OCFA. (Credentials of the expert may be requested).

Locate the OCFA Guideline A-01 on the OCFA website at ocfa.org for assistance. Use the sample letter within A-01 as a model for your draft letter. If an alternative means of protection is approved by the OCFA, an AM & M response letter will be drafted by OCFA. Copy both your AM & M request letter, and the OCFA response letter onto the plans. You will be required to resubmit the plans again for review and final approval.

2. Precise Fuel Modification Plans

If there was not a Conceptual Fuel Modification plan approved, the Precise Fuel Modification plans shall include all information criteria required for Conceptual Fuel Modification plans, and the following additional information (Refer back to Section 1). Refer to Section 10 for the timing of when fuel modification plans need to be approved.

Submit three sets of plans prepared by a licensed Landscape Architect or other design professional with equivalent credentials. Contact OCFA in advance if not using a licensed landscape architect. An electronic copy of the plans is required in a .pdf format prior to approval.

Precise Plan Criteria:

The following information shall be included on the Precise Fuel Modification Plan, in addition to the criteria required for Conceptual Plans:

- A. Location and detail of permanent zone markers. Copy Attachments 3 and 4 on the plans. Additionally, provide the degree of slope on the plan at the location of the zone markers. Some slopes may need to be surveyed. The minimum number of markers is desired. There is no specific lateral spacing requirement due to topography issues. However, adjacent markers shall be spaced to be visible laterally when standing at each marker regardless of how far apart the markers are. Generally, markers are only required near side property lines and at the latter portion of Zone "D". The irrigation piping and replanted area usually identify the latter portion of Zone "B" so markers should not be required.
- B. Plant palette to be designed and installed in accordance with this guideline. Include a plant legend for all trees, tree-form shrubs, shrubs, and ground cover in irrigated zones utilizing the maximum width of mature plants and proposed spacing in accordance with Attachment 6. Care should be taken to select plants that are sensitive to related resource agencies. (i.e., U.S. Fish and Wildlife Service, County Parks, The Nature Conservancy, Orange County Public Facilities and Resource Department, CA. Coastal Commission, and the Orange County Vector Control District). (Refer to the Attachment 8 code symbols and qualification statements and Attachment 6 to design the location of plants) See Section 3 for plant palette information.
- C. Irrigation plans indicating that an irrigation system is being designed and installed.
- D. All applicable maintenance requirements and assignment of responsibility (Refer to Section 10F). Copy Section 10F on the plans. Additionally, copy Attachment 5 on the plan when any zone is maintained by a homeowners association.
- E. New construction inspections are required prior to lumber drop, occupancy, and landscape fuel modification turnover to the final landowner. Copy Section 10 C-E on the plans. Note on the plan that the Landscape Architect or plan designer assumes the responsibility of notifying the builder of the required timing of the new construction related fuel modification inspections.
- F. Fuel modification zones should be located within common lettered lots owned and maintained by associations representing common ownership. When fuel modification zones are located on private property, deed restrictions, easements, or written disclosures are required to specifically identify the restrictions on any portion of the property subject to fuel modification. (Refer to Attachments 2 and 5).

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- G. Place the following note on the plans: “Prior to the maintenance responsibility turnover of Fuel Modification Zones and Special Maintenance Areas from the developer to the final landowner (Section 10.E), the developer is responsible to ensure the originally estimated cost of future maintenance is sufficient to cover the cost of future maintenance, based on the originally approved design. Changes to the fuel modification areas or interrupted maintenance activities by the final landowner, after the final landowner has accepted the long-term maintenance responsibility, become the responsibility of the final landowner”.
- H. Submit written proof the CC and R’s reference the fuel modification areas and associated maintenance. (See Attachment 5).
- I. For alternative proposals that do not meet minimum requirements, see Section 1M.

3. OCFA Plant Palette Information

- A. The plant species from Attachment 8 were approved by various resource agencies responsible for environmental protection. All plants installed shall be selected from Attachment 8 and be grouped and spaced in accordance with Attachment 6. Specific installation requirements are included for various plant species. (See plant code, legend, and qualification statements in Attachment 8). Retained plants shall be proposed for approval on the plans (See below for proposing alternate plant species). All plant species must be submitted in a legend on the plans containing both the botanical and common names and the expected mature width and height, based on common published resources. In irrigated zones plants must be fire resistant and drought-tolerant. New plant species introduced outside of the irrigated zones must also be from Attachment 8 (Or see below). (All plants including species from Attachment 8 will burn given sufficient heat and low moisture content. Vegetative fire resistance may be enhanced through adequate irrigation rates or precipitation).

B. Proposing Alternate Species:

If alternate plant species are proposed, the Landscape Architect shall provide photographs as well as all data on the size and fire resistive characteristics for installation criteria. A maximum of 10 alternate species can be proposed per project. Plant selections need to have similar/equal properties to the plants from Attachment 8. OCFA will make a case-by-case determination as to acceptability of the proposed species. The proposed species must be spaced based on size and characteristics. If the plant materials are proposed to be planted within 300 feet of reserve lands (except plants on the interior of the tract), concurrence from the applicable agencies listed in Section 2.B would be required. If the proposed plants have received previous resource agency approval, no concurrence letter will be required. Contact OCFA prior to your submittal if needed.

4. Zone A – Irrigated Structure Setback Zone

The purpose of the setback zone is to provide a defensible space for fire suppression forces and to protect structures from radiant and convective heat. **Zone A shall not be less than a 20-foot minimum width. The entire structure setback zone is to be located on a level, graded area at the top or base of the slope.**

Zone “A” Approved Configurations:

- If a Homeowners Association (HOA) or other single entity is maintaining only the B-D zones, then locate Zone A on level ground, at the most distal 20 feet within the structure owner’s lot, in order to adjoin Zone B at the base or ridge of the slope. (See Attachment 2)
- If all Zones A-D are maintained by an HOA or adjoining single entity, Zone A shall begin at the lot property line. (See Attachment 2)
- If all zones A-D are to be maintained by the structure owner, then Zone A shall begin at the wall of the structure.

Zone A begins within 100 feet from the protected structure and may incorporate trails, roadways, and other level noncombustible surfaces.

Zone A – Specific Maintenance Requirements

- A. Automatic irrigation systems to maintain healthy vegetation with high moisture content and be regularly irrigated.
- B. Pruning of foliage to reduce fuel load, maintain vertical continuity, and removal of plant litter and dead wood in accordance with Attachment 6.
- C. Complete removal of undesirable plant species (See Attachment 7). There is also minimal allowance for retention of selected native vegetation.
- D. Plants in this zone shall be highly fire resistant and selected from the Attachment 8 for the setback zone and given geographical area. (Refer to Attachment 8 and Section 3).
- E. Tree species within Zone A are not allowed within 10 feet of combustible structures (measured from the edge of a full growth crown).
- F. Maintenance includes thinning and removal of over-growth, replacement of dead/dying plant material with approved fire resistant plantings.
- G. Devices that burn solid fuels are not permitted in any fuel modification zone.
- H. No combustible construction shall be allowed within Zone A.

5. Zone B – Irrigated Zone

This portion of fuel modification consists of irrigated landscaping with a ground cover installed. This irrigated zone adjoins Zone A at the beginning of the slope, and is a minimum of 50 feet in width and may be increased as conditions warrant. Zone B shall be permanently and regularly irrigated. Ground cover is required in Zone B and should cover the entire ground between groups of shrubs, trees, or grasses. The Landscape Architect shall select plant species, design an irrigation system, and design a maintenance program which sensitively addresses water conservation practices and includes methods of erosion control to protect against slope failure. All irrigation shall be kept a minimum of 20 feet from the drip line of any existing native Coast Live Oak species.

Zone B shall be cleared of all undesirable plant species, irrigated, and planted with species from Attachment 8. Exceptions to save desirable species may be submitted for approval by the OCFA on a site-specific basis. One of the goals of Zone B maintenance is to always retain the originally approved design throughout the future.

Zone B – Specific Maintenance Requirements

- A. Groundcover shall be installed and maintained at a height not to exceed 2 feet.
- B. In order to maintain proper coverage, landscape islands with native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 inches.
- C. Apply irrigation rates to maintain healthy vegetation with high moisture content based on plant species specific needs.
- D. All plant species designed for Zone B shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 6, 7, and 8.
- E. Groups of trees, tree-form shrubs, and shrubs that naturally exceed 2 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6. (Attachment 6 has allowances for vertical separation only, based on the height of the specimen and distance from a structure).
- F. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.
- G. Devices that burn solid fuels are not permitted in any fuel modification zone.
- H. Combustible construction is not allowed within Zone B.

6. Zones C and D – Thinning Zones – Non-Irrigated

- **Zone C is 50-Foot in Width**
- **Zone D is 50-Foot in Width**

The thinning zones are located between the irrigated Zone B and the non-maintained wildland area. After vegetation is strategically removed (thinned) within zones C and D, the amount of the fuel load adjacent to the non-maintained wildland area becomes reduced. These zones begin the process of slowing the speed of the moving fire and decreasing its intensity. This reduces the amount of heat and embers produced as the fire approaches the structure(s).

The thinning zones require the specific maintenance activities listed below. In combination with the Attachment 6 requirements, Zone C can be thinned to a 50% reduction level and Zone D can be thinned to a 30% reduction level. After maintenance, the reduction levels can normally be visually compared to the mature vegetation in the non-maintained wildland area.

Zone C and D – Specific Maintenance Requirements

- A. Removal of dead and dying vegetation and undesirable plant species from Attachment 7.
- B. In order to maintain proper coverage, native grasses shall be allowed to go to seed. Native grasses shall be cut after annual seeding. Cut heights shall be approximately 4 inches.
- C. Groups of trees, tree-form shrubs, and shrubs that naturally exceed 2 feet in height shall be vertically pruned, and horizontally spaced in accordance with Attachment 6. (Attachment 6 has allowances for vertical separation only, based on the height of the specimen and distance from a structure).
- D. Plants species introduced into Zone C and D shall be selected from Attachment 8. Existing fuel modification maintenance programs are limited to the plants listed on the approved plans unless a revision is requested. Planting and maintenance shall be in accordance with planting restrictions from Attachments 7 and 8. (See Section 3)
- E. Reduce fuel loading by reducing fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of tree holding root systems. Maintain sufficient cover to prevent erosion without requiring planting. Roots of species listed in Attachment 7 shall be removed from the zone unless an erosion analysis has been performed by a qualified professional or Geologist indicating the need to retain the root systems. Geology reports affecting the fuel modification program shall be provided to the OCFA.

7. Vegetation Management for Interior Common Areas, Manufactured Slopes, and Areas with Non-Irrigated Vegetation (Special Maintenance Areas)

The interior portions of a community are not standard fuel modification zones, but may be subject to planting restrictions, irrigation, and maintenance requirements. This is to ensure structures are reasonably protected from fire continuing into interior areas and from flying embers that may land and start spot fires. If needed, the fuel modification plans shall set forth the maintenance requirements for designated interior areas of the community. Preliminary/conceptual master landscape plans, indicating the general plant palette and density, must be submitted with the fuel modification plans. The interior area master landscape plans will be evaluated to determine if the areas have the potential to increase the hazard to structures or if they will lessen the hazard.

- Applicant shall submit the preliminary/conceptual master landscape plans for all planted and native areas within the tract. It shall be combined in the plan set with the perimeter fuel modification plans (conceptual or precise).
- The areas will be evaluated per Section A below based on location, topography, size, and plant palette as to whether the proposed planting design and/or improper maintenance could create a hazard to adjacent homes.

A. Initial hazard assessment criteria:

1. The community is in any designated Fire Hazard Severity Zone (FHSZ), Wildland-Urban Interface Area (WUI), or Special Fire Protection Area (SFPA).
2. Homes adjacent to the areas are not proposed to have “special construction features.”
3. The roadside planting does not sufficiently protect vital main evacuation routes.
4. There are no proposed planting restrictions on lots.
5. The proximity between structures and landscape slopes is such that fire travel is probable.
6. The area/slope is not proposed to be irrigated.
7. The plant palette for the area/slope contains plant species from the OCFA undesirable plant list.
8. The plant spacing is less than the minimum spacing requirements outlined in this guideline and the plant arrangement creates “Ladder Fuels.”
9. The slope/area is contiguous with community perimeter fuel modification zones and/or the prevailing wind patterns are such that fire travel is probable.

B. Mitigating the potential hazard without a Special Maintenance Area (SMA):

The OCFA shall notify the applicant of specific concerns that will require planting and maintenance restrictions. The OCFA may review alternate proposals by the applicant to gain acceptance of these areas without SMA restrictions. Considerations include:

1. Use of fuel modification zone plant species and fuel modification zone spacing requirements.
2. Use of special construction features on all structures throughout the community.
3. Irrigation.
4. The area is further adequately separated from structures.
5. Plans for the mitigated areas are required to be submitted for review and confirmation of the mitigation and a .pdf electronic file provided to OCFA for permanent records.

NOTE: Irrigated, maintained streetscapes which are community perimeter edges and not part of the perimeter fuel modification will not be regulated unless a distinct hazard is created. If hazards do not exist or have been mitigated to an acceptable level, the information may be used to support fire protection plan proposals in the FHSZ's, WUI, or SFPA designations.

C. Special Maintenance Areas (The hazard has not been reasonably mitigated):

If the interior/manufactured slope or non-irrigated native vegetation portion of a community has hazards are not otherwise mitigated, the area(s) shall be regulated as part of the fuel modification plan and subject to the specific requirements below, as well as approved/recorded maintenance provisions. Those areas will be symbolized and titled on the fuel modification plan as, "Special Maintenance Areas" (SMA).

Example Specific Requirements within Special Maintenance Areas:

1. The irrigation and maintenance requirements of perimeter fuel modification zones apply to these areas.
2. Increased structure setbacks (See Zone A requirements).
3. Only trees and shrubs from the Fuel Modification Zone Plant List will be used.
4. Vegetative under-story must not create a ladder fuel or create the potential for ground fires. The area shall be in accordance with Attachment 6 requirements.

5. Any plants and trees proposed from the OCFA Attachment 7 undesirable list may not be allowed at all. When allowed on approved fuel modification plans they must have special maintenance requirements, such as for standard fuel modification zones or other performance based requirements, and be reviewed through an Alternative Materials and Methods.
6. The identification of structures required to have special construction features from Chapter 7A of the California Building Code (CBC) / Residential Code 327. The construction feature requirements will be identified on the fuel modification plan as to which lots need specific code sections from the CBC/RC327. The affected lots shall also be identified on either the required OCFA reviewed Fire Master Plan or a voluntary special Fire Protection Plan that is submitted and processed. This will also require a letter provided to the Building Official from the developer indicating the specific lots and the construction requirement code sections as OCFA does not review the construction of one and two family dwellings.
7. Plans identifying the SMA are required to be submitted for review and approval and a pdf electronic file provided to OCFA for permanent records. The SMA and their planting designs can be part the fuel modification zone plans.

8. Off-Site Fuel Modification Requirements

All fuel modification should be located within the property or tract of the protected structure(s) and with common ownership such as a HOA and a homeowner is acceptable. Only propose fuel modification outside the tract or property lines as a last case scenario. This is due to problems inherent with enforcement of regulations on the adjacent property, as well as the potential for confusion regarding responsibility for fuel modification on areas outside of legal ownership. Proper on-site fuel modification design should be set back from the Tract boundary lines for a distance of 170 feet in width.

Should off-site fuel modification be deemed a necessity, appropriate legally recorded instruments must be established that clearly state the responsibilities and rights of the parties involved relative to the establishment and maintenance of the fuel modification area. Appropriate recorded documents must include a recorded agreement between all parties or a grant of easement for the establishment and maintenance of the fuel modification area. It should be understood that the allowance of off-site fuel modification by an adjacent property owner may affect the rights, and/or use, of the off-site property. All agreements for any off-site fuel modification shall be integrated into fuel modification plans with a recorded document from adjoining property owner, giving rights to maintain fuels off-site. The plans will not be approved until the recorded agreements are copied on the plans.

9. Fuel Modification Plan Revisions

Revisions to previously approved fuel modification zones or plans shall follow procedures as established by the agency having jurisdiction. Existing fuel modification maintenance programs are limited to the plants and zone distances listed on the approved plans unless a revision is requested to the OCFA. Three sets of revised plans are to be submitted to the OCFA for review along with an electronic .pdf file. The applicant shall provide a copy of the original, stamped OCFA approved plan for reference during the review. Some minor field changes may not need a plan submittal revision, yet those instances shall require approval by OCFA in writing prior to the field change.

10. Fuel Modification Implementation & Required Inspections

This following information shall be placed on precise fuel modification plans, verbatim:

- A. **Prior to Rough Grading Permit Issuance:** The developer/builder shall have approved/stamped Conceptual or Precise Fuel Modification Plan.
- B. **Prior to Precise Grading Permit Issuance:** The developer/builder shall have approved/stamped Precise Fuel Modification Plan, with applicable note stating maintenance language will be provided in CC&Rs and reviewed prior to issuance of certificate of occupancy (Refer to Attachment 5).
- C. **Prior to Building Permit Issuance:** Prior to dropping lumber, the developer/builder shall implement those portions of the approved fuel modification plan determined to be necessary by the OCFA prior to the introduction of any combustible materials into the area. Removal of undesirable species may meet this requirement or a separation of combustible vegetation for a minimum distance of 100 feet from the location of the structure and lumber stock-pile. This generally involves removal and thinning of plant materials indicated on the approved plan. An inspection and/or release letter to the building department is required.
- D. **Prior to Issuance of Certification of Occupancy:** The fuel modification zones adjacent to structures must be installed, irrigated, and inspected. This includes physical installation of features identified in the approved precise fuel modification plans (including, but not limited to, plant establishment, thinning, irrigation, zone markers, access easements, etc). An OCFA Inspector will provide written approval of completion at the time of this final inspection on the building card. When the homeowner maintains all zones, a written disclosure will be requested by the OCFA Inspector indicating that the homeowner is aware of the fuel modification zone on their land and that they are aware of the importance of the plans and the zone. Copies of buyer or builder signed emergency and maintenance access easements shall be presented upon occupancy final (See Section 1,I).

E. Prior to Home Owner Association (HOA) Maintenance Acceptance from Developer:

This inspection/meeting must include the Fire Inspector and the following representatives:

- Landscape design professional
- Installing landscape contractor
- HOA management representative and association board member
- HOA landscape maintenance contractor

The fuel modification areas shall be maintained by the developer as originally installed and approved. The final land owner is responsible to ensure the developer sufficiently calculated the amount of revenue needed to perform the on-going maintenance the Fuel Modification Zones and any Special Maintenance Areas per the approved plans. A copy of the approved plans must be provided to the HOA representatives at this time. Landscape professionals must convey ongoing maintenance requirements to HOA representatives. A written disclosure will be requested by the OCFA Inspector indicating that the homeowner's association is aware of the fuel modification zone on their land and that they are aware of the importance of the plans and the zone. The CC&R language for maintenance must also be provided and approved by the OCFA (Refer to Attachment 5).

- F. Annual Inspection and Maintenance:** The property owner is responsible for all maintenance of the fuel modification. All areas must be maintained indefinitely in accordance with notes on the approved fuel modification plans. This includes a minimum of two growth reduction maintenance activities throughout all fuel modification zones each year. Perform maintenance sometime within time periods of mid to late spring and once again in early to mid fall. Other activities include maintenance of irrigation systems, replacement of dead or dying vegetation with approved species, removal of dead plant material, removal of trees and shrubs not on the approved plans, and removal of undesirable highly combustible species. The landscape maintenance company and/or property manager shall inspect the fuel modification zones throughout the year to identify where specific activities need to take place. The OCFA may conduct inspections of established fuel modification areas. Ongoing maintenance shall be conducted a minimum of twice each year regardless of the dates of these inspections. The property owner shall retain all approved fuel modification plans. The plans should be used to perform the maintenance. As property is transferred, property owners shall disclose the location and regulations of fuel modification zone to the new property owners.

11. Fees

Fees are charged for review of fuel modification plans. These fees also include a limited number of inspections necessary to approve the installation. Additional fees will be applied should a project require additional inspections. Fees may be charged for annual inspection of existing fuel modification areas. Additional non-compliance fees may be applied if identified deficiencies are not corrected within required time frames.

12. Glossary

CONDUCTION - Direct transfer of heat/flames by objects touching each other.

CONVECTIVE HEAT - Transfer of heat by atmospheric currents, which is most critical under windy conditions and in steep terrain.

CROWN - Upper part of a tree or shrub carrying the main branch system and foliage.

CANOPY - More or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and shrubs.

DEFENSIBLE SPACE - The perimeter area around the structure that is strategic in defense against wildfires encroaching and fires escaping the structures. Defensible space refers to the area between a structure and a potential on-coming wildfire. Defensible space is needed when structures are adjoining grass covered, brush covered, forest covered land, or any land which is covered with flammable material including a fuel modification zone (See page 2).

DESIRABLE PLANT LIST - List of plants exhibiting characteristics of low fuel volume, fire resistance, and drought tolerance which make them desirable for planting in areas of high fire danger.

DRIPLINE - Ground area at the outside edge of the canopy.

DROUGHT TOLERANT - The ability of a plant or tree to survive on little water.

FIRE BREAK - Removal of growth, usually in strips, around housing developments to prevent a fire from spreading to the structures from open land or vice versa.

FIRE RESISTANT - Any plant will burn with enough heat and proper conditions. Resistance is often used as a comparative term relating to the ability of a plant to resist ignition.

FIRE RETARDANCE - Relative comparison of plant species related to differences in fuel volume, inherent flammability characteristics, and ease of fire spread.

FUEL BREAK - A wide strip or block of land on which the native or pre-existing vegetation has been permanently modified so that fires burning into it can be more readily extinguished.

FUEL MODIFICATION ZONES - Fuel Modification Zones are landscaping areas in which existing combustible vegetation is removed from strips of land and replaced with spaced and irrigated fire-resistant plants and further adjoining strips of land in which vegetation is partially removed.

FUEL MOISTURE CONTENT - The amount of water in a fuel, expressed as a percentage of the oven dry weight of that fuel.

FUEL VOLUME - The amount of fuel in a plant in a given area of measurement. Generally, an open-spaced plant will be low in volume.

LADDER FUELS - Vertically aligned vegetation arrangements that would allow the vertical transmission of fire into above waiting shrub and tree canopies/crowns. Fire is able to carry from ground surface fuels into crowns with relative ease.

LITTER - The uppermost layer of loose debris composed of freshly fallen or slightly decomposed organic material such as dead sticks, branches, twigs, leaves or needles.

RADIANT HEAT - Transfer of heat by electromagnetic waves and can, therefore, travel against the wind. For example, it can preheat the opposite side of a burning slope in a steep canyon or a neighboring home to the ignition point.

RESERVE LANDS - As defined by the Central Coastal and Southern Natural Communities Conservation Plan or resource agencies.

TARGET SPECIES - Plant species that are generally removed as part of the fuel modification plan (see undesirable species).

THINNING - The process of partially and evenly reducing the density of the vegetation within the whole amount by only removing some of the vegetation.

UNDESIRABLE SPECIES - Those species of plants with inherent characteristics which make them highly combustible. These characteristics can be either physical or chemical. Physical properties include large amounts of dead material retained within the plant, rough or peeling bark, and the production of large amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. These plants are sometimes referred to as target species.

VEGETATION MANAGEMENT - Fuel Modification or Defensible Space plant installation or maintenance activities for the purposes of reducing the intensity of vegetation fires and to reduce the chances of the ignition of structures.

WILDLAND URBAN INTERFACE - That line, area, or zone where structures and other human development meet or intermingles.

FIRE HAZARD SEVERITY ZONES (FHSZ) AND SPECIAL FIRE PROTECTION AREAS (SFPA) - The geographic areas designated on adopted local and state CALFIRE maps. The areas contain the type of vegetation, topography, weather, and fire history that have the possibility of conflagration fires.

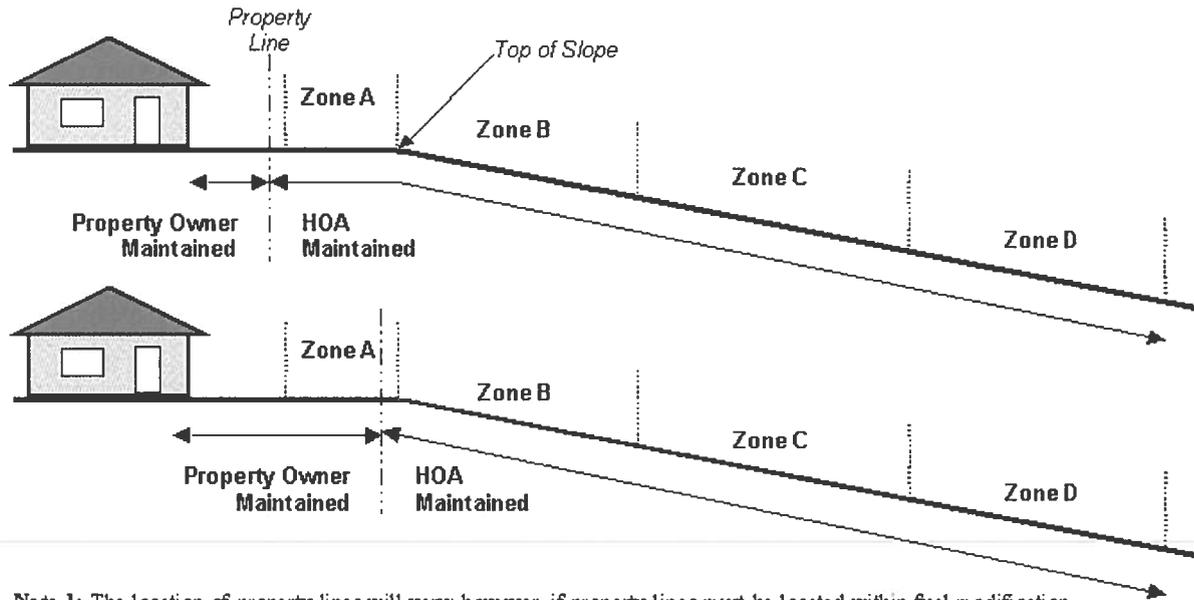
ATTACHMENT 1

FUEL MODIFICATION PLAN SUBMITTAL CHECKLIST

(Use Sections 1 and 2 criteria to design your plan. This Attachment is only a quick reference)

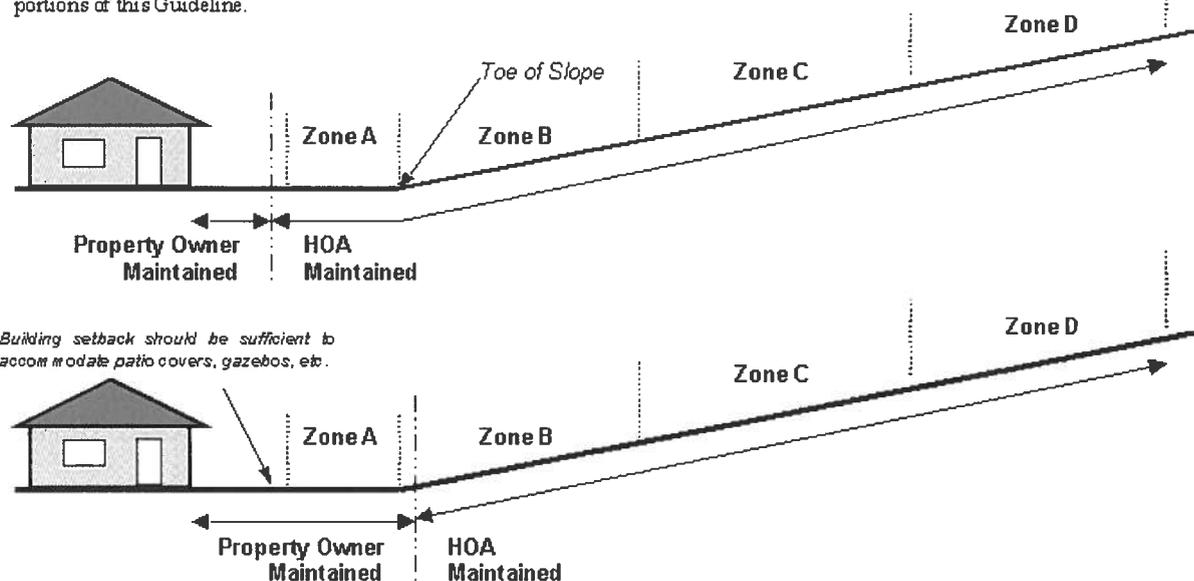
	CONCEPTUAL PLANS	PRECISE PLANS
<input type="checkbox"/> Prior to or Concurrent with review and approval of tentative map (If applicable)	X	
<input type="checkbox"/> Prior to issuance of grading permit (If no grading permit is required, prior to issuance of building permit)		X
<input type="checkbox"/> Number of plans sets to the processing jurisdiction	3 sets and pdf	3 sets and pdf
PLAN REQUIREMENTS (Use Sections 1 and 2 for detailed requirements)		
<input type="checkbox"/> Delineation of each fuel modification zone	X	X
<input type="checkbox"/> Scale Dimensions	X	X
<input type="checkbox"/> Site Characterization	X	X
<input type="checkbox"/> Photographs of area with emphasis on existing vegetation and topography	X	X
<input type="checkbox"/> Indication of permanent zone marker locations and detail		X
<input type="checkbox"/> Delineation of impacted existing vegetation	X	X
<input type="checkbox"/> Description of vegetation removal methodology	X	X
<input type="checkbox"/> Note indicating compliance with approved OCFA plant palette	X	
<input type="checkbox"/> Plan shall include both landscape areas and fuel modification zones.	X	X
<input type="checkbox"/> Plant palette & specifications, including a plant legend (botanical & common names) for existing and proposed plants. <i>A matrix of typical spacing requirements, as well as the following information: planting lines, topography, wind direction, neighboring lot lines.</i>		X
<input type="checkbox"/> Designation of irrigated zone	X	X
<input type="checkbox"/> Irrigation plans and specifications (engineer scale) shall be provided upon request		X
<input type="checkbox"/> Removal of undesirable species (Attachment 7)	X	X
Delineation of proposed development:		
<input type="checkbox"/> Property lines	X	X
<input type="checkbox"/> Contour lines	X	X
<input type="checkbox"/> Building lines or statement indicating limits of proposed development	X	X
<input type="checkbox"/> Emergency and maintenance access easements	X	X
Generally describe characteristics, existing improvements, land uses, wetland and riparian areas & vegetation for 300 feet beyond property lines in all directions	X	X
<input type="checkbox"/> Statement, on the plans, of ultimate maintenance responsibility requirement	X	X
<input type="checkbox"/> Notes to indicate information in CC&Rs, and/or deed restrictions, recorded easements relative to fuel modification areas	X	X
<input type="checkbox"/> Location of all proposed offsite fuel modification areas with easements	X	X

ATTACHMENT 2 FUEL MODIFICATION CONFIGURATION OPTIONS



Note 1: The location of property lines will vary; however, if property lines must be located within fuel modification areas, appropriate documentation (e.g., Maintenance easements and/or deed restrictions) shall be established to: 1) restrict certain activities and uses on those portions of any private property within the fuel modification area, and 2) identify those responsible for the establishment and continued maintenance of the fuel modification area located on private property.

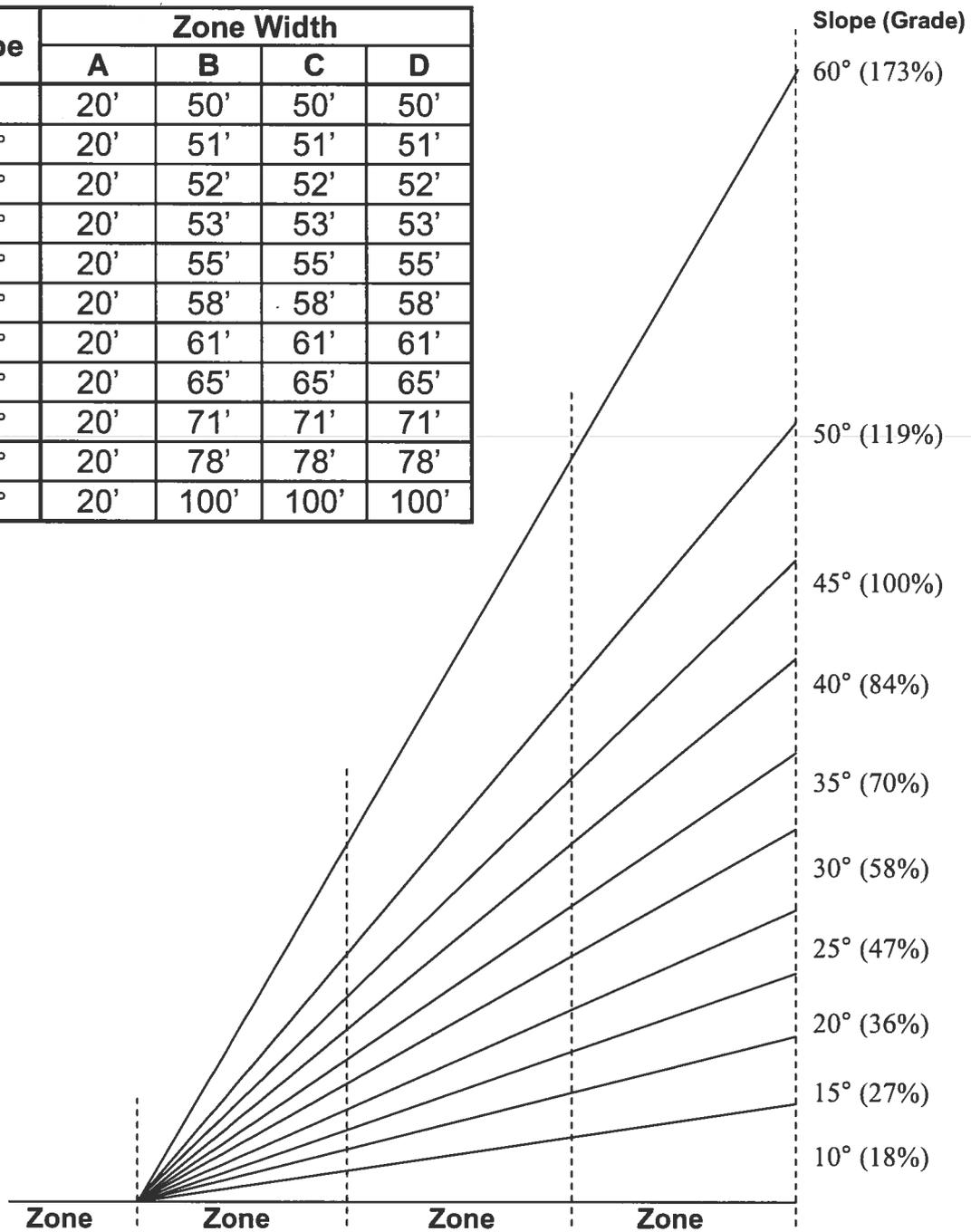
Note 2: Regardless of the entity responsible for fuel modification maintenance, the continued maintenance shall be in accordance with Section 10 "Fuel Modification Implementation & Required Inspections" and other applicable portions of this Guideline.



Attachment 3

INCLINE MEASUREMENT FOR SELECTED SLOPES (See Attachment 4)

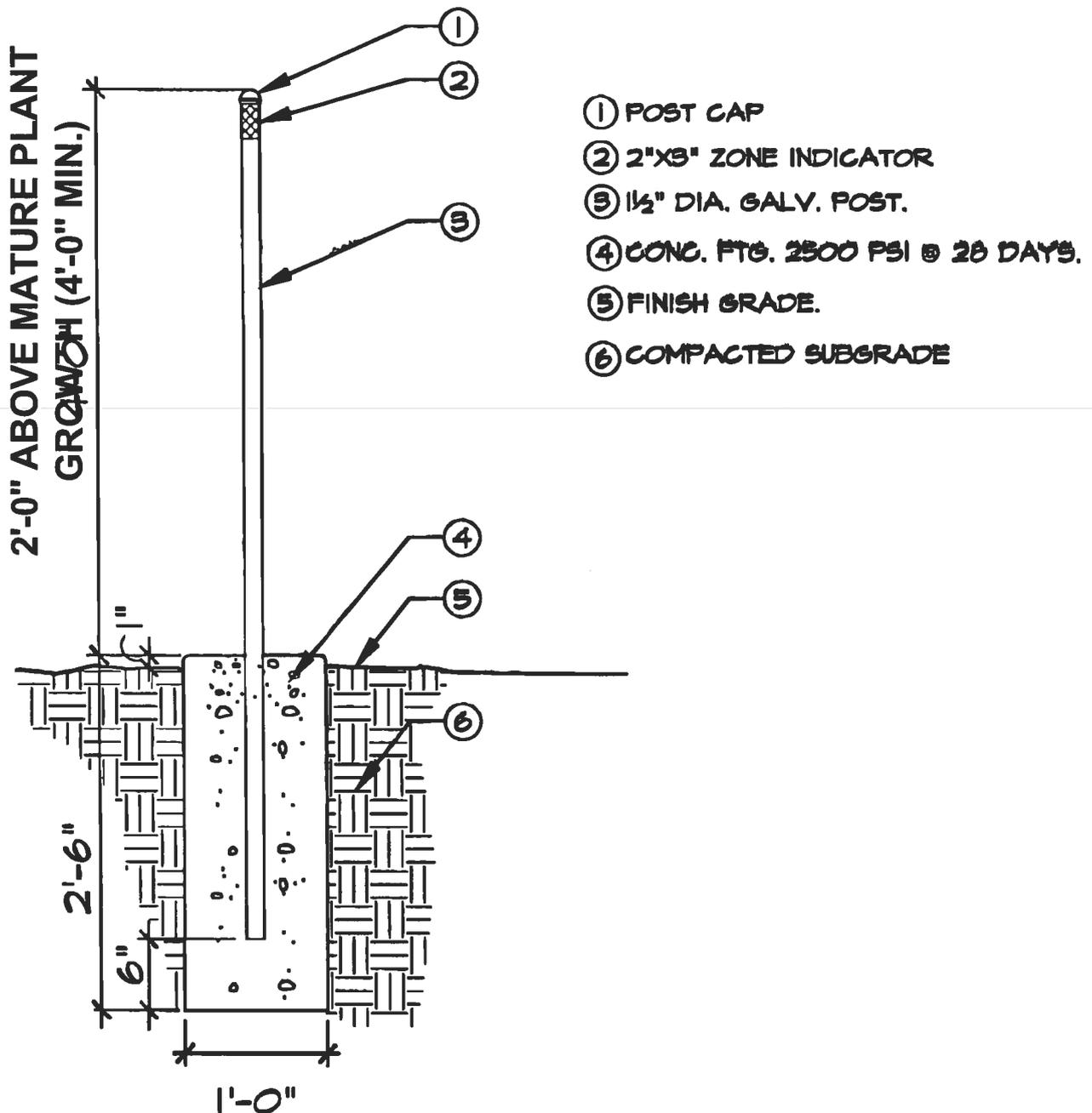
Slope	Zone Width			
	A	B	C	D
0°	20'	50'	50'	50'
10°	20'	51'	51'	51'
15°	20'	52'	52'	52'
20°	20'	53'	53'	53'
25°	20'	55'	55'	55'
30°	20'	58'	58'	58'
35°	20'	61'	61'	61'
40°	20'	65'	65'	65'
45°	20'	71'	71'	71'
50°	20'	78'	78'	78'
60°	20'	100'	100'	100'



Attachment 4

ZONE MARKER DETAILS

(Marker Distances Shall Be Increased on Slopes to Accommodate Incline Measurements in Accordance With Attachment 3)



Attachment 5

SAMPLE CC&R MAINTENANCE LANGUAGE

It is recommended that the following language be included in the CC&Rs recorded for a common interest development:

The duty of the homeowners' association to perform "Fire Prevention Maintenance" (as defined below) for all Fuel Modification Zones and manufactured interior slopes within the development shall be included as an express obligation in the recorded CC&Rs for the development. Similarly, each Owner whose Lot (or Condominium) is subject to Fuel Modification Zone restrictions (e.g., non-combustible structure setback, etc.) shall be obligated to comply with such restrictions.

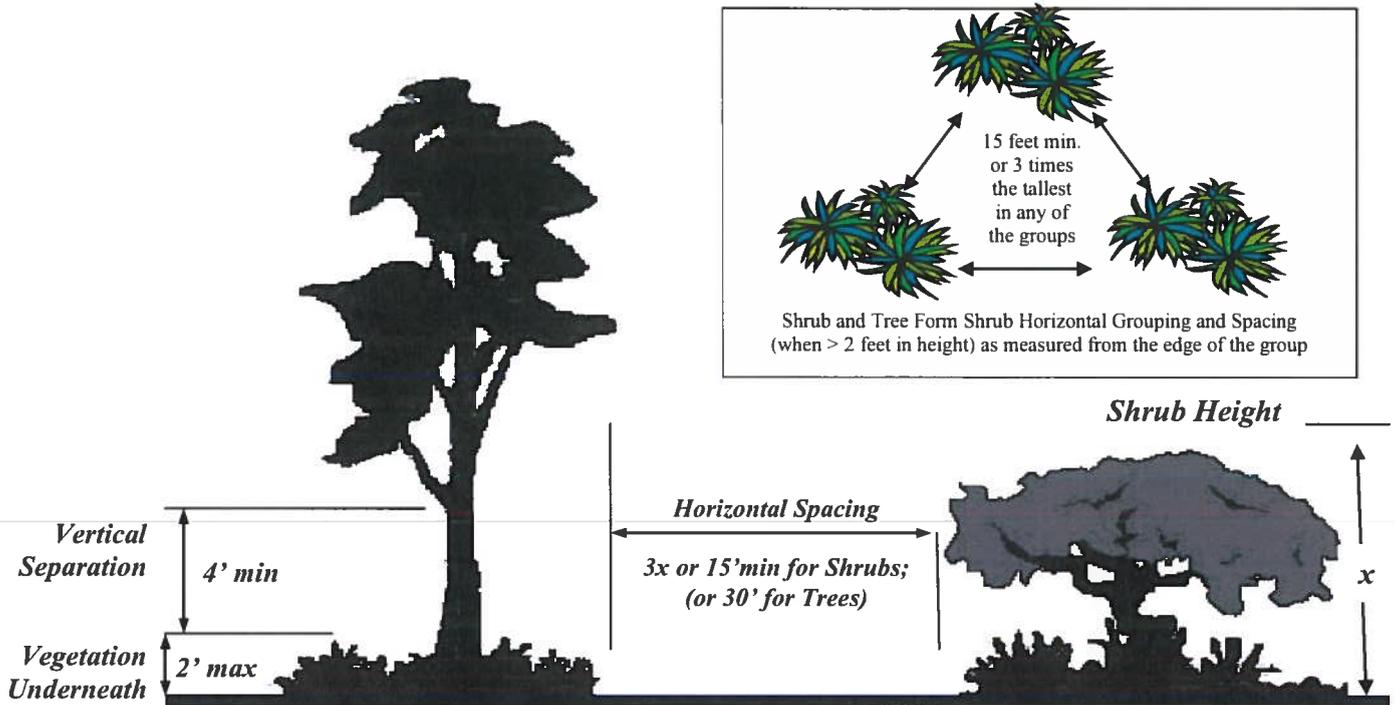
1. The OCFA will be designated as a third party beneficiary of a homeowner association's duty to perform "Fire Prevention Maintenance" (as defined below) for all portions of the Association Property (or Common Area) that constitute fuel modification zones and designated interior/manufactured slopes to be maintained by the homeowners' association, and of any Owner's duty to comply with any fuel modification zone restrictions applicable to their lot (or condominium). Additionally, OCFA shall have the right, but not the obligation, to enforce the homeowners' association's duty to perform such Fire Prevention Maintenance, and to enforce compliance by any owner with any fuel Modification zone restrictions applicable to their lot (or Condominium). In furtherance of such right the OCFA shall be entitled to recover its costs of suit, including its actual attorneys' fees, if it prevails in an enforcement action against a homeowners' association and/or an individual owner. (A sample third party beneficiary provision to be incorporated into the CC&Rs is attached hereto as Addendum "1").
2. As used herein, "Fire Prevention Maintenance" shall mean the following:
 - (i) All portions of the Association Property (or Common Area) that constitute fuel modification zones or designated interior/manufactured slopes shall be regularly maintained by the homeowners association on a year-round basis in accordance with the fuel modification plan on file with the property manager for the development.
 - (ii) The irrigation system for fuel modification zones or designated interior/manufactured slopes shall be kept in good condition and proper working order at all times. The irrigation system shall not be turned off except for necessary repairs and maintenance.

ADDENDUM "1"

Enforcement by the OCFA: The OCFA is hereby designated as an intended third party beneficiary of the Association's duties to perform "Fire Prevention Maintenance" for all portions of the Association Property (or Common Areas) consisting of fuel modification zones or designated interior/manufactured slopes in accordance with the fuel modification plan, and of each Owner's duty to comply with any fuel modification zone or designated interior/manufactured slopes restrictions applicable to his Lot (or condominium) as set forth in the fuel modification plan. In furtherance thereof, the OCFA shall have the right, but not the obligation, to enforce the performance by the association of its duties and any other fire prevention requirements which were imposed by the OCFA or other public agency as a condition of approval for the development (e.g. , prohibition of parking in fire lanes, maintenance of the blue reflective markers indicating the location of fire hydrants, etc.) and shall also have the right, but not the obligation, to enforce compliance by any owner with any fuel modification zone or designated interior/manufactured slopes restrictions applicable to his lot (or condominium) as set forth in the fuel modification plan. If in its sole discretion, the OCFA shall deem it necessary to take legal action against the association or any owner to enforce such duties or other requirements, and prevails in such action, the OCFA shall be entitled to recover the full costs of said action including its actual attorneys' fees, and to impose a lien against the association property, or an owner's lot (or condominium), as the case may be, until said costs are paid in full.

Attachment 6

Horizontal Spacing and Vertical Separation Requirements for Installation and Maintenance in All Fuel Modification Zones



Horizontal Spacing

Vegetation Less than 2 Feet in Height:

- No horizontal spacing or vertical separation is required in all zones. Ground cover in Zone B should cover the entire ground between groups of shrubs, trees, or grasses. Ground cover shall not exceed 2 feet in height.

Shrubs and Trees 2 Feet in Height or Greater:

Shrub and Tree Group Size:

- All Shrubs and Trees can be in groups of 3 specimens or less. No horizontal spacing is required inside the group.

Shrub / Tree-form Shrub Group Spacing:

- Groups of shrubs shall be spaced by the greater of the following two measurements: A distance of 15 feet minimum (or) 3 times the height of the tallest specimen in any of the groups.
- No vegetation over 2 feet in height is allowed within 15 feet from the edge of tree canopy(s).

Tree Group Spacing:

- Groups of Trees shall be spaced by a distance of 30 feet minimum regardless of height.

Vertical Separation

Shrubs and Trees Less than 10 Feet in Height:

- When the fuel modification zone is within 30 feet of the structure, a vertical separation of 2 feet minimum is required from the vegetation below. (Not required if shrubs are further than 30 feet from structure).

Shrubs and Trees 10 Feet in Height or Greater:

- A vertical separation of 4 feet minimum is required to be maintained from the vegetation below.
- Trees only: All vegetation located underneath trees, shall be a maximum of 2 feet in height.

Attachment 7

UNDESIRABLE PLANT SPECIES (Target Species)

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be either physical or chemical. Physical properties that would contribute to high flammability include large amounts of dead material retained within the plant, rough or peeling bark, and the production of copious amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants are notorious for containing these volatile substances.

Plants with these characteristics shall not be planted in any fuel modification zones. Should these species already exist within these areas, they shall be removed because of the potential threat they pose to any structures. They are referred to as target species since their complete removal is a critical part of hazard reduction. These fire-prone plant species include (but not limited to):

FIRE PRONE PLANT SPECIES (MANDATORY REMOVAL)

<u>Botanical Name</u>	<u>Common Name</u>
Cynara Cardunculus	Artichoke Thistle
Ricinus Communis	Castor Bean Plant
Cirsium Vulgare	Wild Artichoke
Brassica Nigra	Black Mustard
Silybum Marianum	Milk Thistle
Sacsola Austails	Russian Thistle/Tumblewood
Nicotiana Bigelevel	Indian Tobacco
Nicotiana Glauca	Tree Tobacco
Lactuca Serriola	Prickly Lettuce
Conyza Canadensis	Horseweed
Heterothaca Grandiflora	Telegraph Plant
Anthemix Cotula	Mayweed
Urtica Urens	Burning Nettle
Cardaria Draba	Noary Cress, Perennial Peppergrass
Brassica Rapa	Wild Turnip, Yellow Mustard, Field Mustard
Adenostoma Fasciculatum	Chamise
Adenostoma Sparsifolium	Red Shanks
Cortaderia Selloana	Pampas Grass
Artemisia Californica	California Sagebrush
Eriogonum Fasciculatum	Common Buckwheat
Salvia Mellifera	Black Sage
Ornamental:	
Cortaderia	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine
Arecaceae (all palm sp)	Palms

Attachment 8

FUEL MODIFICATION ZONE PLANT LIST

(Note: Legend can be found on page 37)

	<u>Code</u>	<u>Botanical Name</u>	<u>Common Name</u>	<u>Plant Form</u>
1.	W	<i>Abelia x grandiflora</i>	Glossy Abelia	Shrub
2.	n	<i>Acacia redolens</i> desert carpet	Desert Carpet	Shrub
3.	o	<i>Acer macrophyllum</i>	Big Leaf Maple	Tree
4.	X	<i>Achillea millefolium</i>	Common Yarrow	Low Shrub
5.	W	<i>Achillea tomentosa</i>	Woolly Yarrow	Low Shrub
6.	X	<i>Aeonium decorum</i>	Aeonium	Ground cover
7.	X	<i>Aeonium simsii</i>	no common name	Ground cover
8.	W	<i>Agave attenuata</i>	Century Plant	Succulent
9.	W	<i>Agave shawii</i>	Shaw's Century Plant	Succulent
10.	N	<i>Agave victoriae-reginae</i>	no common name	Ground Cover
11.	X	<i>Ajuga reptans</i>	Carpet Bugle	Ground Cover
12.	W	<i>Alnus cordata</i>	Italian Alder	Tree
13.	o	<i>Alnus rhombifolia</i>	White Alder	Tree
14.	N	<i>Aloe arborescens</i>	Tree Aloe	Shrub
15.	N	<i>Aloe aristata</i>	no common name	Ground Cover
16.	N	<i>Aloe brevifoli</i>	no common name	Ground Cover
17.	W	<i>Aloe Vera</i>	Medicinal Aloe	Succulent
18.	W	<i>Alogyne huegeii</i>	Blue Hibiscus	Shrub
19.	o	<i>Ambrosia chamissonis</i>	Beach Bur-Sage	Perennial
20.	o	<i>Amorpha fruticosa</i>	Western False Indigobush	Shrub
21.	W	<i>Anigozanthus flavidus</i>	Kangaroo Paw	Perennial/accent
22.	o	<i>Antirrhinum nuttalianum</i> ssp.	no common name	Subshrub

23.	X	<i>Aptenia cordifolia</i> x 'Red Apple'	Red Apple Aptenia	Ground cover
24.	W	<i>Arbutus unedo</i>	Strawberry Tree	Tree
25.	W	<i>Arctostaphylos</i> 'Pacific Mist'	Pacific Mist Manzanita	Ground Cover
26.	W	<i>Arctostaphylos edmundsii</i>	Little Sur Manzanita	Ground Cover
27.	o	<i>Arctostaphylos glandulosa</i> ssp.	Eastwood Manzanita	Shrub
28.	W	<i>Arctostaphylos hookeri</i> 'Monterey Carpet'	Monterey Carpet Manzanita	Low Shrub
29.	N	<i>Arctostaphylos pungens</i>	no common name	Shrub
30.	N	<i>Arctostaphylos refugioensis</i>	Refugio Manzanita	Shrub
31.	W	<i>Arctostaphylos uva-ursi</i>	Bearberry	Ground Cover
32.	W	<i>Arctostaphylos</i> x 'Greensphere'	Greensphere Manzanita	Shrub
33.	N	<i>Artemisia caucasica</i>	Caucasian Artemisia	Ground Cover
34.	X	<i>Artemisia pycnocephala</i>	Beach Sagewort	Perennial
35.	X	<i>Atriplex canescens</i>	Four-Wing Saltbush	Shrub
36.	X	<i>Atriplex lentiformis</i> ssp. <i>breweri</i>	Brewer Saltbush	Shrub
37.	o	<i>Baccharis emoyi</i>	Emory Baccharis	Shrub
38.	W o	<i>Baccharis pilularis</i> ssp. <i>consanguinea</i>	Chaparral Bloom	Shrub
39.	X	<i>Baccharis pilularis</i> var. <i>pilularis</i>	Twin Peaks #2'	Ground Cover
40.	o	<i>Baccharis salicifolia</i>	Mulefat	Shrub
41.	N	<i>Baileya multiradiata</i>	Desert Marigold	Ground Cover
42.	N n	<i>Bougainvillea spectabilis</i>	Bougainvillea	Shrub
43.	o	<i>Brickellia californica</i>	no common name	Subshrub
44.	W o	<i>Bromus carinatus</i>	California Brome	Grass
45.	o	<i>Camissonia cheiranthifolia</i>	Beach Evening Primrose	Perennial Shrub
46.	N	<i>Carissa macrocarpa</i>	Green Carpet Natal Plum	Ground Cover/Shrub
47.	X	<i>Carpobrotus chilensis</i>	Sea Fig Ice Plant	Ground Cover
48.	W	<i>Ceanothus gloriosus</i> 'Point Reyes'	Point Reyes Ceanothus	Shrub

49.	W	<i>Ceanothus griseus</i> 'Louis Edmunds'	Louis Edmunds Ceanothus	Shrub
50.	W	<i>Ceanothus griseus horizontalis</i>	Yankee Point	Ground Cover
51.	W	<i>Ceanothus griseus</i> var. <i>horizontalis</i>	Carmel Creeper Ceanothus	Shrub
52.	W	<i>Ceanothus griseus</i> var. <i>horizontalis</i>	Yankee Point Ceanothus	Shrub
53.	o	<i>Ceanothus megarcarpus</i>	Big Pod Ceanothus	Shrub
54.	W	<i>Ceanothus prostratus</i>	Squaw Carpet Ceanothus	Shrub
55.	o	<i>Ceanothus spinosus</i>	Green Bark Ceanothus	Shrub
56.	W	<i>Ceanothus verrucosus</i>	Wart-Stem Ceanothus	Shrub
57.	W	<i>Cerastium tomentosum</i>	Snow-in-Summer	Ground cover/Shrub
58.	W	<i>Ceratonia siliqua</i>	Carob	Tree
59.	W	<i>Cercis occidentalis</i>	Western Redbud	Shrub/Tree
60.	X	<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy	Ground Cover
61.	W	<i>Cistus Crispus</i>	no common name	Ground Cover
62.	W	<i>Cistus hybridus</i>	White Rockrose	Shrub
63.	W	<i>Cistus incanus</i>	no common name	Shrub
64.	W	<i>Cistus incanus</i> ssp. <i>Corsicus</i>	no common name	Shrub
65.	W	<i>Cistus salviifolius</i>	Sageleaf Rockrose	Shrub
66.	W	<i>Cistus x purpureus</i>	Orchid Rockrose	Shrub
67.	W	<i>Citrus species</i>	Citrus	Tree
68.	o	<i>Clarkia bottae</i>	Showy Fairwell to Spring	Annual
69.	o	<i>Cneoridium dumosum</i>	Bushrue	Shrub
70.	o	<i>Collinsia heterophyllia</i>	Chinese Houses	Annual
71.	W o	<i>Comarostaphylis diversifolia</i>	Summer Holly	Shrub
72.	N	<i>Convolvulus cneorum</i>	Bush Morning Glory	Shrub
73.	W	<i>Coprosma kirkii</i>	Creeping Coprosma	Ground Cover/Shrub
74.	W	<i>Coprosma pumila</i>	Prostrate Coprosma	Low shrub

75.	o	<i>Coreopsis californica</i>	California Coreopsis	Annual
76.	W	<i>Coreopsis lanceolata</i>	Coreopsis	Ground Cover
77.	N	<i>Corea pulchella</i>	Australian Fuschia	Ground Cover
78.	W	<i>Cotoneaster buxifolius</i>	no common name	Shrub
79.	W	<i>Cotoneaster congestus</i> 'Likiang'	Likiang Cotoneaster	Ground Cover/Vine
80.	W	<i>Cotoneaster aprneyi</i>	no common name	Shrub
81.	X	<i>Crassula lactea</i>	no common name	Ground Cover
82.	X	<i>Crassula multicava</i>	no common name	Ground Cover
83.	X	<i>Crassula ovata</i>	Jade Tree	Shrub
84.	X	<i>Crassula tetragona</i>	no common name	Ground Cover
85.	W o	<i>Croton californicus</i>	California Croton	Ground Cover
86.	X	<i>Delosperma 'alba'</i>	White trailing Ice Plant	Ground Cover
87.	o	<i>Dendromecon rigida</i>	Bush Poppy	Shrub
88.	o	<i>Dichelostemma capitatum</i>	Blue Dicks	Herb
89.	N	<i>Distinctis buccinatoria</i>	Blood-Red Trumpet Vine	Vine/Climbing vine
90.	N	<i>Dodonaea viscosa</i>	Hopseed Bush	Shrub
91.	X	<i>Drosanthemum floribundum</i>	Rosea Ice Plant	Ground Cover
92.	X	<i>Drosanthemum hispidum</i>	no common name	Ground Cover
93.	X	<i>Drosanthemum speciosus</i>	Dewflower	Ground Cover
94.	o	<i>Dudleya lanceolata</i>	Lance-leaved Dudleya	Succulent
95.	o	<i>Dudleya pulverulenta</i>	Chalk Dudleya	Succulent
96.	W	<i>Elaeagnus pungens</i>	Silverberry	Shrub
97.	o	<i>Encelia californica</i>	California Encelia	Small Shrub
98.	o *	<i>Epilobium canum</i> [<i>Zauschneria californica</i>]	Hoary California Fuschia	Shrub
99.	o	<i>Eriastrum Sapphirinum</i>	Mojave Woolly Star	Annual
100.	N	<i>Eriobotrya japonica</i>	Loquat	Tree

101.	o	<i>Eriodictyon crassifolium</i>	Thick Leaf Yerba Santa	Shrub
102.	o	<i>Eriodictyon trichocalyx</i>	Yerba Santa	Shrub
103.	W o	<i>Eriophyllum confertiflorum</i>	no common name	Shrub
104.	W	<i>Erythrina species</i>	Coral Tree	Tree
105.	N	<i>Escallonia species</i>	Several varieties	Shrub
106.	W o	<i>Eschscholzia californica</i>	California Poppy	Flower
107.	X	<i>Eschscholzia mexicana</i>	Mexican Poppy	Herb
108.	N	<i>Euonymus fortunei</i>	Winter Creeper Euonymus	Ground Cover
109.	N	<i>Feijoa sellowiana</i>	Pineapple Guava	Shrub/Tree
110.	N	<i>Fragaria chiloensis</i>	Wild Strawberry/Sand Strawberry	Ground Cover
111.	o	<i>Frankenia salina</i>	Alkali Heath	Ground Cover
112.	W	<i>Fremontodendron californicum</i>	California Flannelbush	Shrub
113.	X	<i>Gaillardia x grandiflora</i>	Blanketflower	Ground Cover
114.	W	<i>Galvezia speciosa</i>	Bush Snapdragon	Shrub
115.	W	<i>Garrya ellipta</i>	Silktassel	Shrub
116.	X	<i>Gazania hybrids</i>	South African Daisy	Ground Cover
117.	X	<i>Gazania rigens leucolaena</i>	Training Gazania	Ground Cover
118.	o	<i>Gillia capitata</i>	Globe Gilia	Perennial
119.	W	<i>Gilia leptantha</i>	Showy Gilia	Perennial
120.	W	<i>Gilia tricolor</i>	Bird's Eyes	Perennial
121.	W	<i>Ginkgo biloba</i>	Maidenhair Tree	Tree
122.	o	<i>Gnaphalium californicum</i>	California Everlasting	Annual
123.	W	<i>Grewia occidentalis</i>	Starflower	Shrub
124.	o	<i>Grindelia stricta</i>	Gum Plant	Ground Cover
125.	N n	<i>Hakea suaveolens</i>	Sweet Hakea	Shrub
126.	W	<i>Hardenbergia comptoniana</i>	Lilac Vine	Shrub

127.	N	<i>Heliathemum muutabile</i>	Sunrose	Ground Cover/Shrub
128.	o	<i>Helianthemum scoparium</i>	Rush Rose	Shrub
129.	o	<i>Heliotropium curassavicum</i>	Salt Heliotrope	Ground Cover
130.	X	<i>Helix Canariensis</i>	English Ivy	Ground Cover
131.	W	<i>Hesperaloe parviflora</i>	Red Yucca	Perennial
132.	o n	<i>Heteromeles arbutifolia</i>	Toyon	Shrub
133.	X	<i>Hypericum calycimum</i>	Aaron's Beard	Shrub
134.	N	<i>Iberis sempervirens</i>	Edging Candytuft	Ground Cover
135.	N	<i>Iberis umbellatum</i>	Globe Candytuft	Ground Cover
136.	o	<i>Isocoma menziesii</i>	Coastal Goldenbush	Small Shrub
137.	o	<i>Isomeris arborea</i>	Bladderpod	Shrub
138.	W	<i>Iva hayesiana</i>	Poverty Weed	Ground Cover
139.	N	<i>Juglans californica</i>	California Black Walnut	Tree
140.	o	<i>Juncus acutus</i>	Spiny Rush	Perennial
141.	o	<i>Keckiella antirrhinoides</i>	Yellow Bush Penstemon	Subshrub
142.	o	<i>Keckiella cordifolia</i>	Heart Leaved Penstemon	Subshrub
143.	o	<i>Keckiella ternata</i>	Blue Stemmed Bush Penstemon	Subshrub
144.	W	<i>Kniphofia uvaria</i>	Red Hot Poker	Perennial
145.	W	<i>Lagerstroemia indica</i>	Crape Myrtle	Tree
146.	W	<i>Lagunaria patersonii</i>	Primrose Tree	Tree
147.	X	<i>Lampranthus aurantiacus</i>	Bush Ice Plant	Ground Cover
148.	X	<i>Lampranthus filicaulis</i>	Redondo Creeper	Ground Cover
149.	X	<i>Lampranthus spectabilis</i>	Trailing Ice Plant	Ground Cover
150.	W	<i>Lantana camara cultivars</i>	Yellow Sage	Shrub
151.	W	<i>Lantana montevidensis</i>	Trailing Lantana	Shrub
152.	o	<i>Lasthenia californica</i>	Dwarf Goldfields	Annual

153.	W	<i>Lavandula dentata</i>	French Lavender	Shrub
154.	W	<i>Leptospermum laevigatum</i>	Australian Tea Tree	Shrub
155.	W	<i>Leucophyllum frutescens</i>	Texas Ranger	Shrub
156.	o	<i>Leymus condensatus</i>	Giant Wild Rye	Large Grass
157.	N	<i>Ligustrum japonicum</i>	Texas privet	Shrub
158.	X	<i>Limonium pectinatum</i>	no common name	Ground Cover
159.	X	<i>Limonium perezii</i>	Sea Lavender	Shrub
160.	W n	<i>Liquidambar styraciflua</i>	American Sweet Gum	Tree
161.	W	<i>Liriodendron tulipifera</i>	Tulip Tree	Tree
162.	X	<i>Lonicera japonica 'Halliana'</i>	Hall's Japanese Honeysuckle	Vining Shrub
163.	o	<i>Lonicera subspicata</i>	Wild Honeysuckle	Vining Shrub
164.	X	<i>Lotus corniculatus</i>	Bird's Foot Trefoil	Ground Cover
165.	o	<i>Lotus hermannii</i>	Northern Woolly Lotus	Perennial
166.	o	<i>Lotus scoparius</i>	Deerweed	Shrub
167.	W	<i>Lupinus arizonicus</i>	Desert Lupine	Annual
168.	W	<i>Lupinus benthamii</i>	Spider Lupine	Annual
169.	o	<i>Lupinus bicolor</i>	Sky Lupine	Flowering annual
170.	o	<i>Lupinus sparsiflorus</i>	Loosely Flowered Annual Lupine/Coulter's Lupine	Annual
171.	W	<i>Lyonothamnus floribundus ssp. Asplenifolius</i>	Fernleaf Ironwood	Tree
172.	W	<i>Macadamia integrifolia</i>	Macadamia Nut	Tree
173.	W	<i>Mahonia aquifolium 'Golden Abundance'</i>	Golden Abundance Oregon Grape	Shrub
174.	W	<i>Mahonia nevenii</i>	Nevin Mahonia	Shrub
175.	o	<i>Malacothamnus fasciculatus</i>	Chapparal Mallow	Shrub
176.	X	<i>Malephora luteola</i>	Training Ice Plant	Ground Cover
177.	W	<i>Maytenus boaria</i>	Mayten Tree	Tree
178.	W	<i>Melaleuca nesophila</i>	Pink Melaleuca	Shrub

179.	N	<i>Metrosideros excelsus</i>	New Zealand Christmas Tree	Tree
180.	o *	<i>Mimulus species</i>	Monkeyflower	Flower
181.	o	<i>Mirabilis californica</i>	Wishbone Bush	Perrenial
182.	N	<i>Myoporum debile</i>	no common name	Shrub
183.	W	<i>Myoporum insulare</i>	Boobyalla	Shrub
184.	W	<i>Myoporum parvifolium</i>	no common name	Ground Cover
185.	W	<i>Myoporum 'Pacificum'</i>	no common name	Ground Cover
186.	o	<i>Nassella (stipa) lepidra</i>	Foothill Needlegrass	Ground Cover
187.	o	<i>Nassella (stipa) pulchra</i>	Purple Needlegrass	Ground Cover
188.	o	<i>Nemophila menziesii</i>	Baby Blue Eyes	Annual
189.	X	<i>Nerium Oleander</i>	Oleander	Shrub
190.	o	<i>Nolina cismontana</i>	Chapparal Nolina	Shrub
191.	N	<i>Nolina species</i>	Mexican Grasstree	Shrub
192.	W	<i>Oenothera belandieri</i>	Mexican Evening Primrose	Ground Cover
193.	N	<i>Oenothera hookeri</i>	California Evening Primrose	Flower
194.	W	<i>Oenothera speciosa</i>	Show Evening Primrose	Perrenial
195.	X	<i>Ophiopogon japonicus</i>	Mondo Grass	Ground Cover
196.	o *	<i>Opuntia littoralis</i>	Prickly Pear	Cactus
197.	o *	<i>Opuntia oricola</i>	Oracle Cactus	Cactus
198.	o *	<i>Opuntia prolifera</i>	Coast Cholla	Cactus
199.	W	<i>Osmanthus fragrans</i>	Sweet Olive	Shrub
200.	X	<i>Osteospermum fruticosum</i>	Training African Daisy	Ground Cover
201.	X	<i>Parkinsonia aculeata</i>	Mexican Palo Verde	Tree
202.	W	<i>Pelargonium peltatum</i>	Ivy Geranium	Ground Cover
203.	X	<i>Penstemon species</i>	Beard Tongue	Shrub
204.	W	<i>Photinia fraseria</i>	no common name	Shrub

205.	W	<i>Pistacia chinensis</i>	Chinese Pistache	Tree
206.	X	<i>Pittosporum undulatum</i>	Victorian Box	Tree
207.	o	<i>Plantago erecta</i>	California Plantain	Annual
208.	**	<i>Plantago insularis</i>	Woolly Plantain	Annual
209.	X	<i>Plantago sempervirens</i>	Evergreen Plantain	Ground Cover
210.	W	<i>Plantanus racemosa</i>	California Sycamore	Tree
211.	W	<i>Plumbago auriculata</i>	Plumbago Cape	Shrub
212.	o	<i>Populus fremontii</i>	Western Cottonwood	Tree
213.	X	<i>Portulacaria afra</i>	Elephant's Food	Shrub
214.	o	<i>Potentilla glandulosa</i>	Sticky Cinquefoil	Subshrub
215.	X	<i>Potentilla tabernaemontanii</i>	Spring Cinquefoil	Ground Cover
216.	X	<i>Prunus caroliniana</i>	Carolina Cherry Laurel	Shrub/Tree
217.	o	<i>Prunus ilicifolia</i> ssp. <i>Ilicifolia</i>	Holly Leafed Cherry	Shrub
218.	X	<i>Prunus lyonii</i>	Catalina Cherry	Shrub/Tree
219.	N	<i>Punica granatum</i>	Pomegranate	Shrub/Tree
220.	W	<i>Puya species</i>	Puya	Succulent/Shrub
221.	W	<i>Pyracantha species</i>	Firethorn	Shrub
222.	o	<i>Quercus agrifolia</i>	Coast Live Oak	Tree
223.	o n *	<i>Quercus berberidifolia</i>	California Scrub Oak	Shrub
224.	o n *	<i>Quercus dumosa</i>	Coastal Scrub Oak	Shrub
225.	X	<i>Quercus engelmannii</i>	Engelmann Oak	Tree
226.	X	<i>Quercus suber</i>	Cork Oak	Tree
227.	X	<i>Rhamnus alaternus</i>	Italian Buckthorn	Shrub
228.	o	<i>Rhamnus californica</i>	California Coffee Berry	Shrub
229.	o	<i>Rhamnus crocea</i>	Redberry	Shrub
230.	o	<i>Rhamnus crocea</i> ssp. <i>Ilicifolia</i>	Hollyleaf Redberry	Shrub

231.	N	Rhaphiolepis species	Indian Hawthorne	Shrub
232.	o	Rhus integrifolia	Lemonade Berry	Shrub
233.	N	Rhus lancea	African Sumac	Tree
234.	o n	Rhus ovata	Sugarbush	Shrub
235.	o	Ribes aureum	Golden Currant	Shrub
236.	o	Ribes indecorum	White Flowering Currant	Shrub
237.	o	Ribes speciosum	Fuschia Flowering Gooseberry	Shrub
238.	W	Ribes viburnifolium	Evergreen currant	Shrub
239.	o *	Romneya coulteri	Matilija Poppy	Shrub
240.	X	Romneya coulteri 'White Cloud'	White Cloud Matilija Poppy	Shrub
241.	W n	Rosmarinus officinalis	Rosemary	Shrub
242.	W n	Salvia greggii	Autums Sage	Shrub
243.	W n	Salvia sonomensis	Creeping Sage	Ground Cover
244.	o	Sambucus mexicana	Mexican Elderberry	Tree
245.	W	Santolina chamaecyparissus	Lavender Cotton	Ground Cover
246.	W	Santolina virens	Green Lavender Cotton	Shrub
247.	o	Satureja chandleri	San Miguel Savory	Perennial
248.	o	Scirpis scutus	Hard Stem Bulrush	Perennial
249.	o	Scirpus californicus	California Bulrush	Perennial
250.	X	Sedum acre	Goldmoss Sedum	Ground Cover
251.	X	Sedum album	Green Stonecrop	Ground Cover
252.	X	Sedum confusum	no common name	Ground Cover
253.	X	Sedum lineare	no common name	Ground Cover
254.	X	Sedum x rubrotinctum	Pork and Beans	Ground Cover
255.	X	Senecio serpens	no common name	Ground Cover
256.	o	Sisyrinchium bellum	Blue Eyed Grass	Ground Cover

257.	o	<i>Solanum douglasii</i>	Douglas Nightshade	Shrub
258.	o	<i>Solanum xanthii</i>	Purple Nightshade	Perennial
259.	W	<i>Stenocarpus sinuatus</i>	Firewheel Tree	Tree
260.	W	<i>Strelitzia nicolai</i>	Giant Bird of Paradise	Perennial
261.	W	<i>Strelitzia reginae</i>	Bird of Paradise	Perennial
262.	o	<i>Symphoricarpos mollis</i>	Creeping Snowberry	Shrub
263.	W	<i>Tecoma stans (Stenolobium stans)</i>	Yellow Bells	Shrub/Small Tree
264.	X	<i>Tecomaria capensis</i>	Cape Honeysuckle	Ground Cover
265.	N	<i>Teucarium chamedrys</i>	Germander	Ground Cover
266.	N	<i>Thymus serpyllum</i>	Lemon Thyme	Ground Cover
267.	N	<i>Trachelospermum jasminoides</i>	Star Jasmine	Shrub
268.	o	<i>Trichostems lanatum</i>	Woolly Blue Curls	Shrub
269.	X	<i>Trifolium hirtum 'Hyron'</i>	Hyron Rose Clover	Ground Cover
270.	X	<i>Trifolium fragerum 'O'Connor's'</i>	O'Connor's Legume	Ground Cover
271.	o	<i>Umbellularia californica</i>	California Laurel	Tree
272.	o	<i>Verbena lasiostachys</i>	Western Vervain	Perennial
273.	N	<i>Verbena peruviana</i>	no common name	Ground Cover
274.	X	<i>Verbena species</i>	Verbena	Ground Cover
275.	X	<i>Vinca minor</i>	Dwarf Periwinkle	Ground Cover
276.	o	<i>Vitis girdiana</i>	Desert Wild Grape	Vine
277.	X	<i>Vulpia myuros 'Zorro'</i>	Zorro Annual Fescue	Grass
278.	W	<i>Westringia fruticosa</i>	no common name	Shrub
279.	W	<i>Xannithorrhoea species</i>	Grass Tree	Perennial accent/shrub
280.	W	<i>Xylosma congestum</i>	Shiny Xylosma	Shrub
281.	X	<i>Yucca Species</i>	Yucca	Shrub
282.	o	<i>Yucca whipplei</i>	Yucca	Shrub

Symbol Legend:

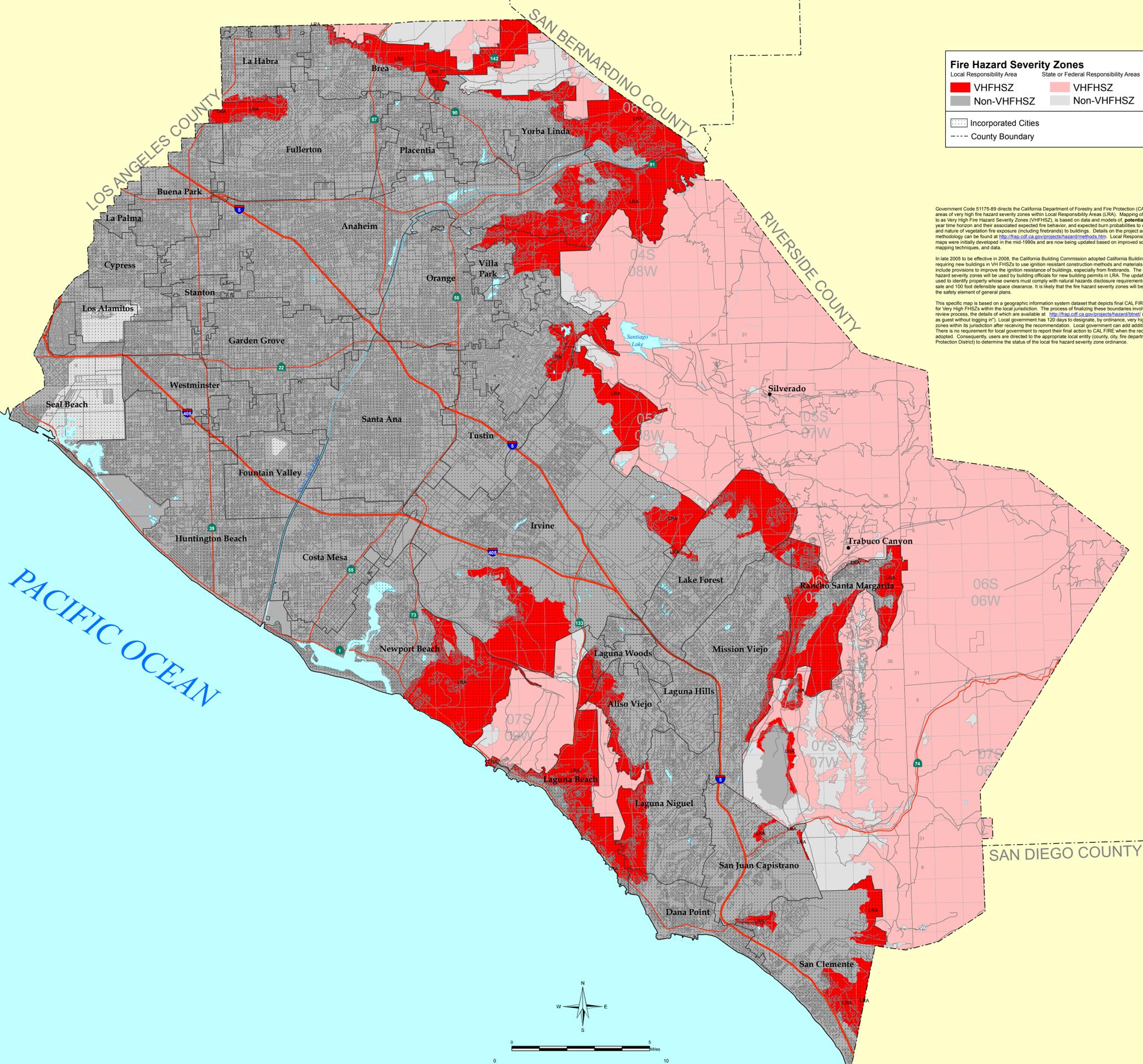
- X = Plant species prohibited in wet and dry fuel modification zones adjacent to reserve lands. Acceptable on all other fuel modification locations and zones.
- W = Plant species appropriate for use in wet fuel modification zones adjacent to reserve lands. Acceptable in all other wet and irrigated dry (manufactured slopes) fuel modification locations and zones.
- o = Plant species native to Orange County. Acceptable in all fuel modification wet and dry zones in all locations.
- N = Plant species acceptable on a limited basis (maximum 30% of the area) in wet fuel modification zones *adjacent to reserve lands*. Acceptable on all other fuel modification zones.
- * = If locally collected.
- ** = Not native but can be used in all zones.
- n = Plant species acceptable on a limited use basis. Refer to qualification requirements following plant palette.

Approved Plant Palette – Qualification Statements for Select Plant Species

2. **Acacia redolens desert carpet:** May be used in the upper ½ of the “B” fuel modification zone. The plants may be planted at 8-foot on center, maximum spacing in meandering zones not to exceed a mature width of 24 feet or a mature height of 24 inches.
43. **Bougainvillea spectabilis (procumbent varieties):** Procumbent to mounding varieties may be used in the mid “B” fuel modification zone. The plants may be planted in groups at 6-foot on center spacing not to exceed eight plants per group. Mature spacing between individual plants or groups shall be 30-foot minimum.
126. **Hakea suaveolens:** May be used in the mid “B” fuel modification zone. The plants shall be used as single specimens with mature spacing between plants of 30-foot minimum.
133. **Heteromeles arbutifolia:** May be used in the mid to lower “B” fuel modification zone. The plants may be planted in groups of up to 3 plants per group. Mature spacing between individual plants or groups shall be 30-foot minimum.
161. **Liquidambar styraciflua:** May be used in the mid “B” fuel modification zone. The plant shall be used as single specimens with mature spacing between trees and 30-foot minimum.
224. **Quercus berberdifolia:** Additional information may be required as directed by the OCFA unless approved on the plan as shown.

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- 225. Quercus dumosa:** May be used in the mid to lower “B” fuel modification zone. The plants may be planted in groups of up to 3 plants per group. Mature spacing between individual plants or groups shall be 30-foot minimum.
- 235. Rhus ovata:** May be used in the mid to lower “B” fuel modification zone of inland areas only. The plants may be planted in groups of up to 3 plants per group. Mature spacing between individual plants or groups shall be 30-foot minimum.
- 241. Rosmarinus officinalis:** When used as a ground cover, it shall be maintained at 2 feet in height. Additional information may be required as directed by the OCFA.
- 243. Salvia greggii:** Additional information may be required as directed by the OCFA unless approved on the plan as shown.
- 244. Salvia sonomensis:** May be used in the mid to upper “B” fuel modification zone. The plants may be planted in groups of up to 3 plants per group. Mature spacing between individual plants or groups shall be 15-foot minimum.

VERY HIGH FIRE HAZARD SEVERITY ZONES IN LRA As Recommended By CAL FIRE



Fire Hazard Severity Zones

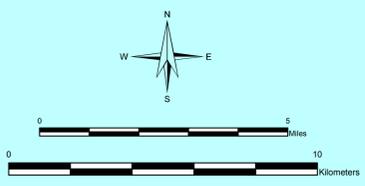
Local Responsibility Area		State or Federal Responsibility Areas	
■	VHFHSZ	■	VHFHSZ
■	Non-VHFHSZ	■	Non-VHFHSZ

Incorporated Cities
 County Boundary

Government Code 51175.89 directs the California Department of Forestry and Fire Protection (CAL FIRE) to identify areas of very high fire hazard severity zones within Local Responsibility Areas (LRA). Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on data and models of potential fuels over a 30-50 year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to buildings. Details on the project and specific modeling methodology can be found at <http://frap.cdf.ca.gov/projects/hazard/memo.html>. Local Responsibility Area VHFHSZ maps were initially developed in the mid-1990s and are now being updated based on improved science, mapping techniques, and data.

In late 2005 to be effective in 2008, the California Building Commission adopted California Building Code Chapter 7A requiring new buildings in VHFHSZs to use ignition resistant construction methods and materials. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated very high fire hazard severity zones will be used by building officials for new building permits in LRA. The updated zones will also be used to identify property whose owners must comply with natural hazards disclosure requirements at time of property sale and 100 foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.

This specific map is based on a geographic information system dataset that depicts final CAL FIRE recommendations for Very High Fire Hazard Severity Zones within the local jurisdiction. The process of finalizing these boundaries involved an extensive local review process, the details of which are available at <http://frap.cdf.ca.gov/projects/hazard/faq.html> (click on "Continue as guest without logging in"). Local government has 120 days to designate, by ordinance, very high fire hazard severity zones within its jurisdiction after receiving the recommendation. Local government can add additional VHFHSZs. There is no requirement for local government to report their final action to CAL FIRE when the recommended zones are adopted. Consequently, users are directed to the appropriate local entity (county, city, fire department, or Fire Protection District) to determine the status of the local fire hazard severity zone ordinance.



California Teale Albers, NAD 1983
Scale 1: 100,000
at 30" x 34"
October 2011



The State of California and the Department of Forestry and Fire Protection make no representations or warranties regarding the accuracy of data or maps. Neither the State nor the Department shall be liable under any circumstances for any direct, special, incidental, or consequential damages with respect to any claim by any user or third party on account of, or arising from, the use of data or maps.

Obtain FRAP maps, data, metadata and publications on the Internet at <http://frap.cdf.ca.gov>
For more information, contact CDF-FRAP, PO Box 944246, Sacramento, CA 94244-2460, (916) 327-3939.

Jerry Brown, Governor, State of California
John Laird, Secretary for Resources, The Natural Resources Agency
Ken Pimlott, Director, Department of Forestry and Fire Protection

MAP ID: OrangeCo
DATA SOURCES
CAL FIRE Fire Hazard Severity Zones (FHSZL06_1)
CAL FIRE Very High Fire Hazard Severity Zones in LRA - Orange (c30fhszl06_3)