

# City of Brea

Fire Department

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## **Brea Very High Fire Hazard Severity Zone Requirements**

### **Technical Design for New Construction Fuel Modification Plans and Maintenance Program**



Date: January 1, 2014

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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.

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 BFD 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 Brea 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).

**This guideline addresses only the Fuel Modification design and maintenance process requirements.**

## SUBMITTAL CRITERIA REQUIREMENTS

### Design of the Zones:

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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 Brea Fire Department (BFD) may require a meeting prior to plan submittal to ensure an overall understanding of program scope and requirements during the design phase. Call 714-990-7655 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 Brea Fire Department. 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 BFD review. Contact BFD 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 BFD at 714-990-7655.

**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:**

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- 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
  - 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 BFD for assessment, 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.
- 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

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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 BFD 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 setback shall include at least 10 feet of combustible vegetation clearance in accordance with City of Brea amendments to the California Fire Code, or as approved by the fire code official.
- 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 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 BFD. (Credentials of the expert may be requested).

## 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 BFD 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.

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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).
- 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”.

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- 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. Brea Fire Department 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. BFD 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 BFD prior to your submittal if needed.

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#### 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, unless approved by the fire code official.**

##### 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.

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## 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 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 BFD 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.

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## 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 BFD.

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## 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 BFD 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 BFD shall notify the applicant of specific concerns that will require planting and maintenance restrictions. The BFD 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 Brea Fire 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 of 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.

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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 BFD 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 BFD reviewed Fire Master Plan or a voluntary special Fire Protection Plan that is submitted and processed.
  7. Plans identifying the SMA are required to be submitted for review and approval and a pdf electronic file provided to BFD 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. If applicable 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 BFD. Three sets of revised plans are to be submitted to the BFD for review along with an electronic .pdf file. The applicant shall provide a copy of the original, stamped BFD 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 Brea Fire 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 BFD 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.
- 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). A Brea Fire 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 BFD 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

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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 BFD 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 BFD (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 BFD 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

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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.

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**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 BFD 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:**

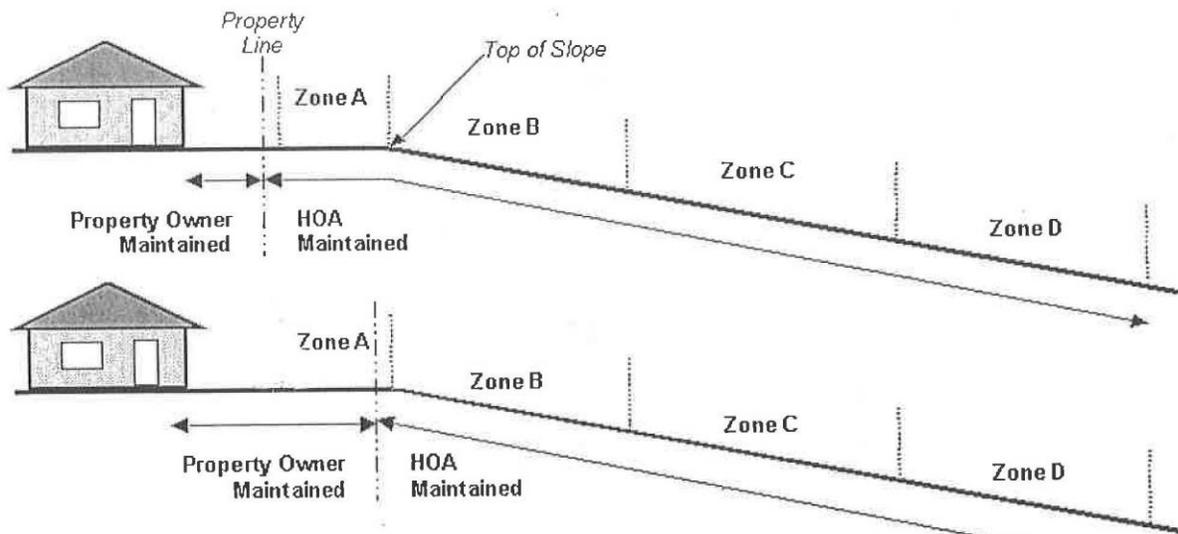
<input type="checkbox"/> Property lines	X	X
<input type="checkbox"/> Contour lines	X	X
<input type="checkbox"/> Building lines or statement indicating limits of proposed development	X	X
<input type="checkbox"/> Emergency and maintenance access easements	X	X

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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

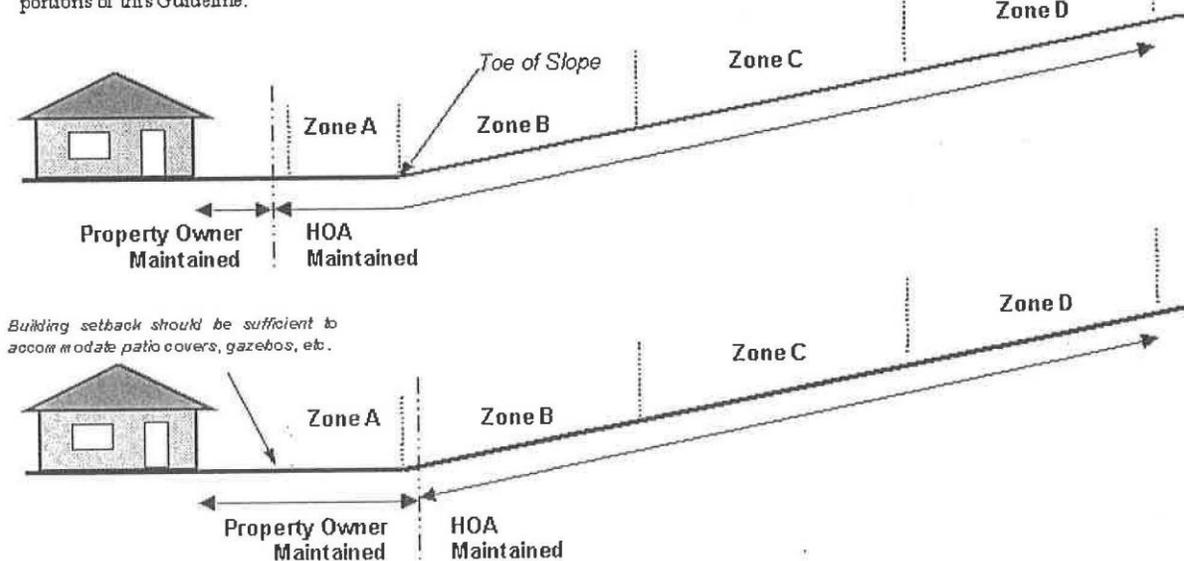
## ATTACHMENT 2

### 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.

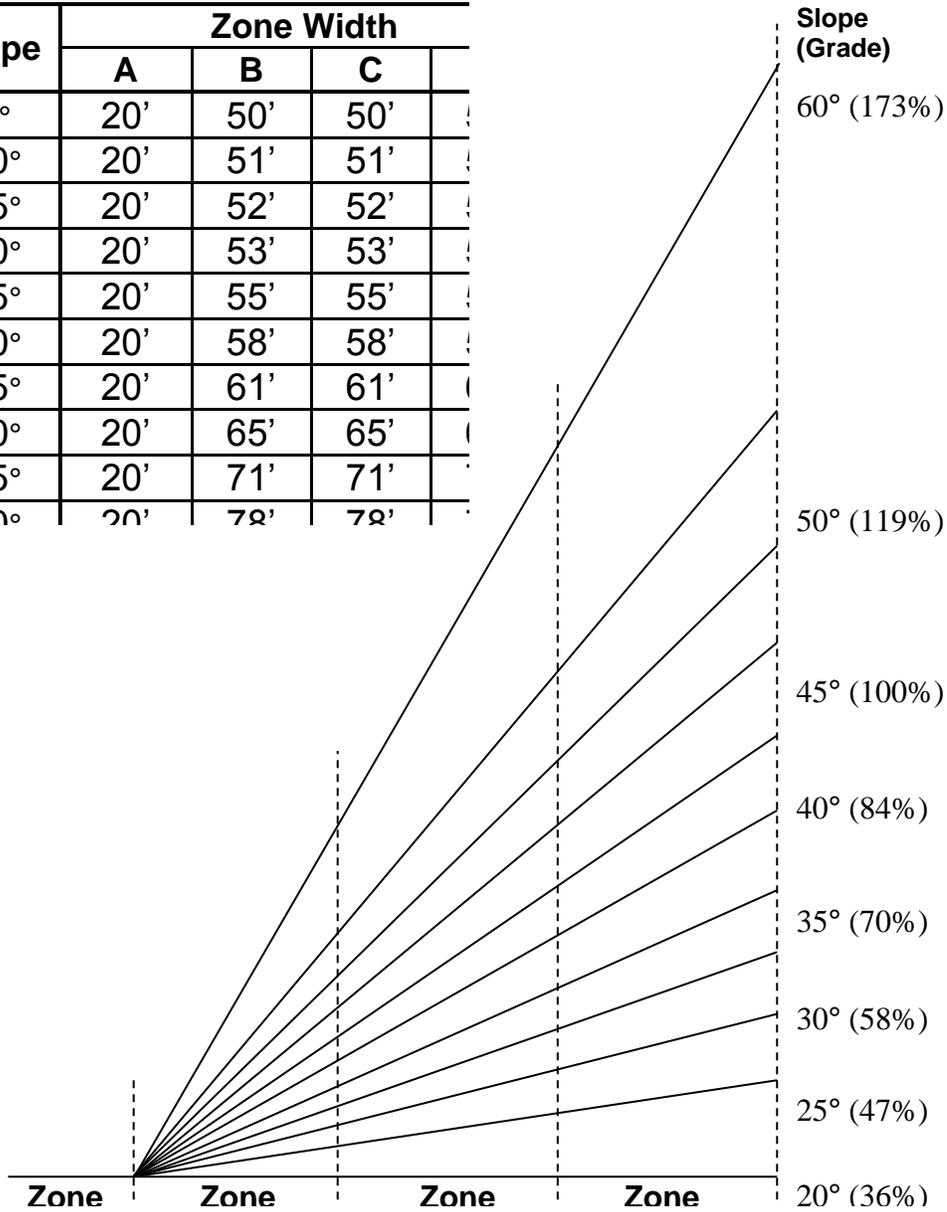
**Note 2:** Regardless of the entity responsible for fuel modification maintenance, the continued maintenance shall be in accordance with Section 10 "Fuel Modification Implementation & Required Inspections" and other applicable portions of this Guideline.



## Attachment 3

### INCLINE MEASUREMENT FOR SELECTED SLOPES (See Attachment 4)

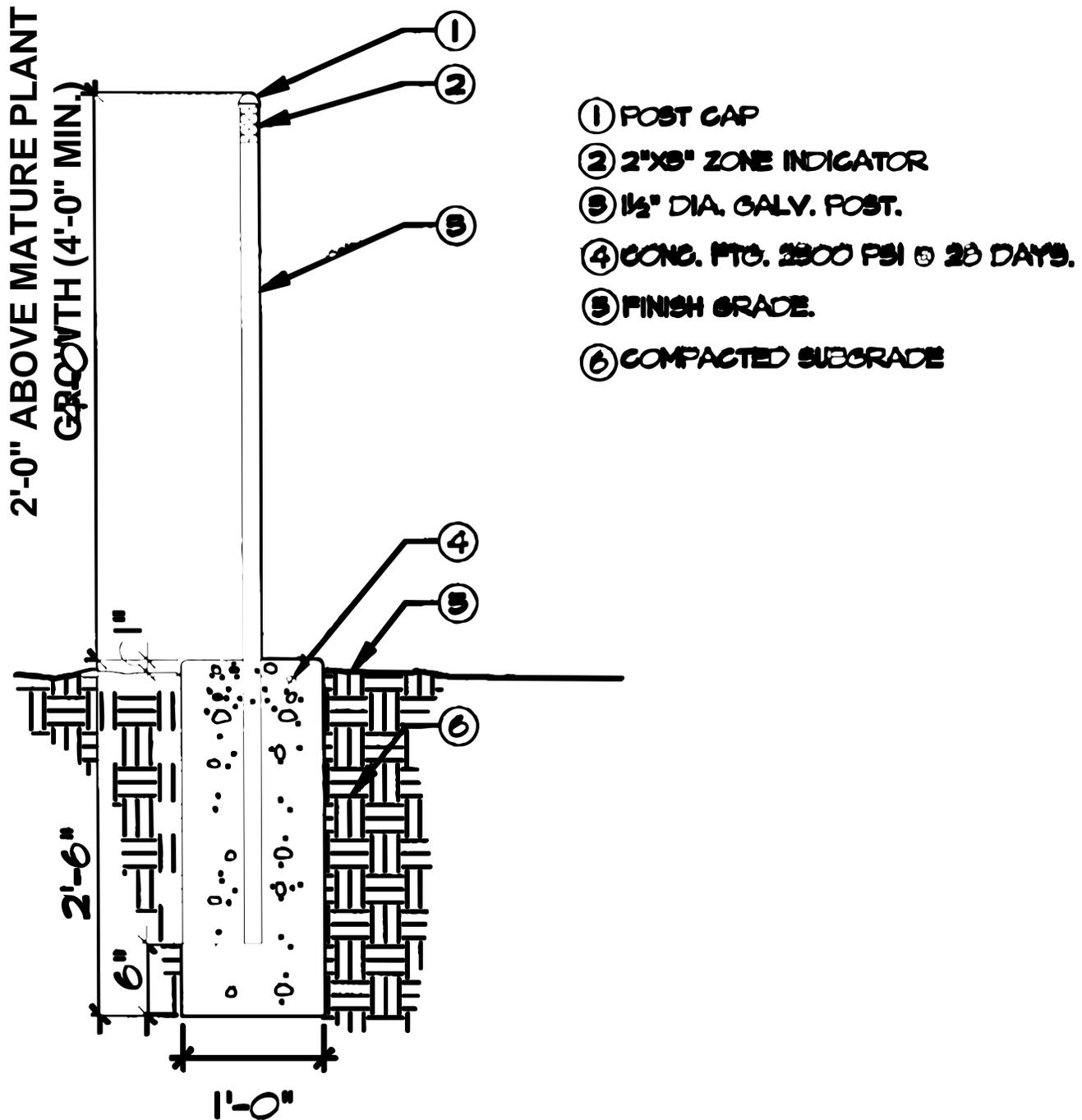
Slope	Zone Width		
	A	B	C
0°	20'	50'	50'
10°	20'	51'	51'
15°	20'	52'	52'
20°	20'	53'	53'
25°	20'	55'	55'
30°	20'	58'	58'
35°	20'	61'	61'
40°	20'	65'	65'
45°	20'	71'	71'
50°	20'	78'	78'



## Attachment 4

### ZONE MARKER DETAILS

(Marker Distances Shall Be Increased on Slopes to Accommodate



Incline Measurements in Accordance With Attachment 3)



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## **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.

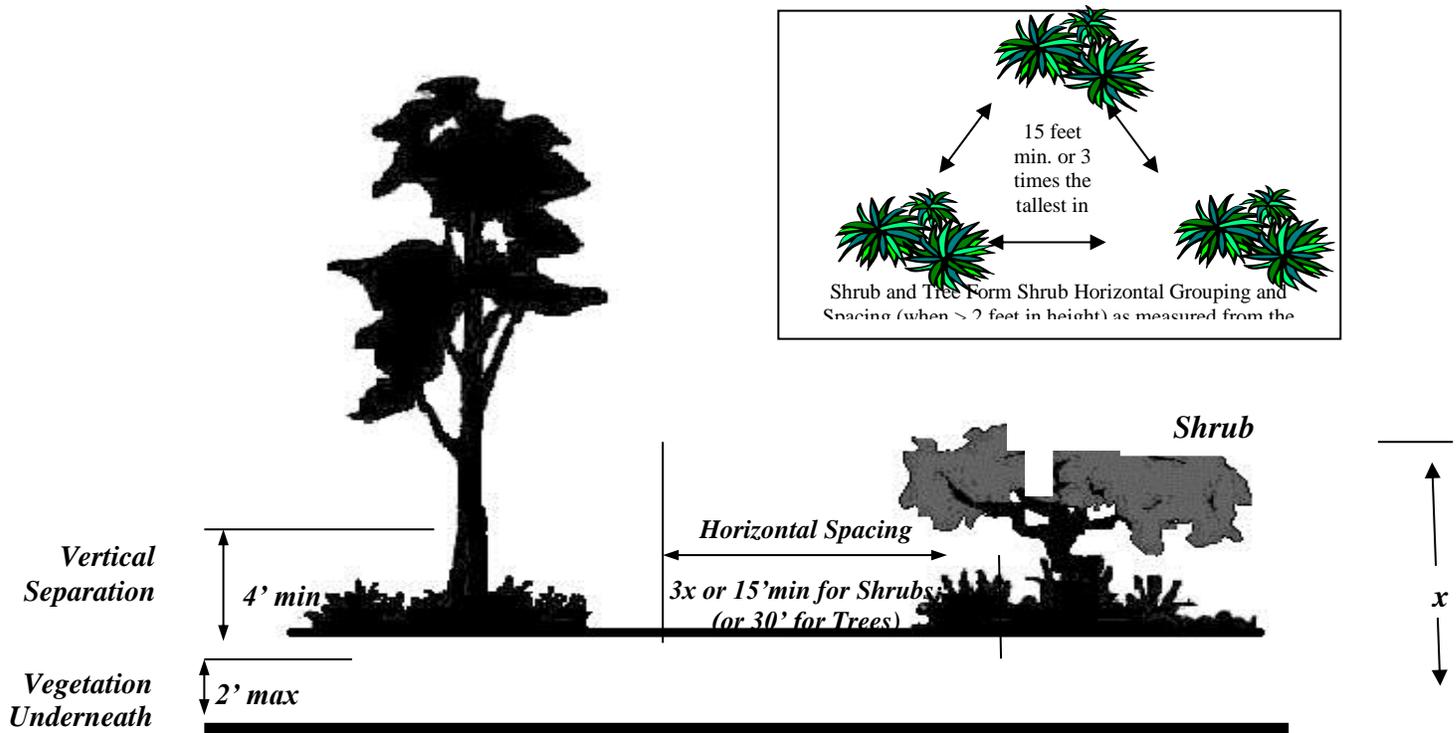
1. The BFD will be designated as a third party beneficiary of a homeowner association's duty to perform "Fire Prevention Maintenance" (as defined below) for all portions of the Association Property (or Common Area) that constitute fuel modification zones and designated interior/manufactured slopes to 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, Brea Fire 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 BFD 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 BFD: The BFD 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 BFD 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 BFD 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 BFD 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 BFD 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 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 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 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.

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## 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)**

<b><u>Botanical Name</u></b>	<b><u>Common Name</u></b>
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 Bigelevil	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
<b>Ornamental:</b>	
Cortaderia	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine

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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	Abelia x grandiflora	Glossy Abelia	Shrub
2.	n	Acacia redolens desert carpet	Desert Carpet	Shrub
3.	o	Acer macrophyllum	Big Leaf Maple	Tree
4.	X	Achillea millefolium	Common Yarrow	Low Shrub
5.	W	Achillea tomentosa	Woolly Yarrow	Low Shrub
6.	X	Aeonium decorum	Aeonium	Ground cover
7.	X	Aeonium simsii	no common name	Ground cover
8.	W	Agave attenuata	Century Plant	Succulent
9.	W	Agave shawii	Shaw's Century Plant	Succulent
10.	N	Agave victoriae-reginae	no common name	Ground Cover
11.	X	Ajuga reptans	Carpet Bugle	Ground Cover
12.	W	Alnus cordata	Italian Alder	Tree
13.	o	Alnus rhombifolia	White Alder	Tree
14.	N	Aloe arborescens	Tree Aloe	Shrub
15.	N	Aloe aristata	no common name	Ground Cover
16.	N	Aloe brevifoli	no common name	Ground Cover
17.	W	Aloe Vera	Medicinal Aloe	Succulent
18.	W	Alogyne huegeii	Blue Hibiscus	Shrub
19.	o	Ambrosia chammissonis	Beach Bur-Sage	Perennial
20.	o	Amorpha fruticosa	Western False Indigobush	Shrub

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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

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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 megacarpus</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

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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 Fuscia	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

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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>Fremontondendron 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

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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

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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</i> cultivars	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</i> 'Halliana'	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

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171.	W	<i>Lyonothamnus floribundus</i> ssp. <i>Asplenifolius</i>	Fernleaf Ironwood	Tree
172.	W	<i>Macadamia integrifolia</i>	Macadamia Nut	Tree
173.	W	<i>Mahonia aquifolium</i> 'Golden Abundance'	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</i> species	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</i> 'Pacificum'	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</i> species	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

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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 ssp. 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

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221.	W	<i>Pyracantha</i> species	Firethorn	Shrub
222.	o	<i>Quercus agrifolia</i>	Coast Live Oak	Tree
223.	o n *	<i>Quercus berberdifolia</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	<i>Rhaphiolepis</i> species	Indian Hawthorne	Shrub
232.	o	<i>Rhus integrifolia</i>	Lemonade Berry	Shrub
233.	N	<i>Rhus lancea</i>	African Sumac	Tree
234.	o n	<i>Rhus ovata</i>	Sugarbush	Shrub
235.	o	<i>Ribes aureum</i>	Golden Currant	Shrub
236.	o	<i>Ribes indecorum</i>	White Flowering Currant	Shrub
237.	o	<i>Ribes speciosum</i>	Fuschia Flowering Gooseberry	Shrub
238.	W	<i>Ribes viburnifolium</i>	Evergreen currant	Shrub
239.	o *	<i>Romneya coulteri</i>	Matilija Poppy	Shrub
240.	X	<i>Romneya coulteri</i> 'White Cloud'	White Cloud Matilija Poppy	Shrub
241.	W n	<i>Rosmarinus officinalis</i>	Rosemary	Shrub
242.	W n	<i>Salvia greggii</i>	Autums Sage	Shrub
243.	W n	<i>Salvia sonomensis</i>	Creeping Sage	Ground Cover
244.	o	<i>Sambucus mexicana</i>	Mexican Elderberry	Tree
245.	W	<i>Santolina chamaecyparissus</i>	Lavender Cotton	Ground Cover

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246.	W	<i>Santolina virens</i>	Green Lavender Cotton	Shrub
247.	o	<i>Satureja chandleri</i>	San Miguel Savory	Perennial
248.	o	<i>Scirpis scutus</i>	Hard Stem Bulrush	Perennial
249.	o	<i>Scirpus californicus</i>	California Bulrush	Perennial
250.	X	<i>Sedum acre</i>	Goldmoss Sedum	Ground Cover
251.	X	<i>Sedum album</i>	Green Stonecrop	Ground Cover
252.	X	<i>Sedum confusum</i>	no common name	Ground Cover
253.	X	<i>Sedum lineare</i>	no common name	Ground Cover
254.	X	<i>Sedum x rubrotinctum</i>	Pork and Beans	Ground Cover
255.	X	<i>Senecio serpens</i>	no common name	Ground Cover
256.	o	<i>Sisyrinchium bellum</i>	Blue Eyed Grass	Ground Cover
257.	o	<i>Solanum douglasii</i>	Douglas Nightshade	Shrub
258.	o	<i>Solanum xantii</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>Teucrium 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>Trichostema 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

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271.	o	Umbellularia californica	California Laurel	Tree
272.	o	Verbena lasiostachys	Western Vervain	Perennial
273.	N	Verbena peruviana	no common name	Ground Cover
274.	X	Verbena species	Verbena	Ground Cover
275.	X	Vinca minor	Dwarf Periwinkle	Ground Cover
276.	o	Vitis girdiana	Desert Wild Grape	Vine
277.	X	Vulpia myuros 'Zorro'	Zorro Annual Fescue	Grass
278.	W	Westringia fruticosa	no common name	Shrub
279.	W	Xannithorrhoea species	Grass Tree	Perennial accent/shrub
280.	W	Xylosma congestum	Shiny Xylosma	Shrub
281.	X	Yucca Species	Yucca	Shrub
282.	o	Yucca whipplei	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

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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 BFD unless approved on the plan as shown.
  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 BFD.
  243. **Salvia greggii:** Additional information may be required as directed by the BFD 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.