CITY OF NEWPORT BEACH

LIFE SAFETY SERVICES

Fuel Modification Plans and Maintenance Standards for Conversion from a Hazard Reduction Zone to Fuel Modification Zone

Guideline G.04

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G.04.1 INTRODUCTION

Vegetation management has proven to be a major factor in reducing the chances of buildings igniting from wildfires and from wildland areas being ignited from burning buildings. When combined with special building construction features, the chances of ignition are further reduced. Fire and Building Department agencies adopt local codes that require vegetation management and special construction features. The Fuel Modification Plan is a vegetation management standard that requires landscaped areas adjacent to new or reconstructed buildings to be dedicated for permanent vegetation management activities.

G.04.2 PURPOSE

The City of Newport Beach has applied vegetation management requirements for over 25 years. Fuel Modification Zones, an alternative to traditional brush clearance practices, were established by the Wildland Urban Interface Task Force in July 1994. The purpose of these standards is to provide information on how fuel modification zones are to be designed, installed, and maintained in order to meet state and city requirements. The many variables involved with fuel modification make precise regulations impractical.

G.04.3 SCOPE

All new construction, and existing structures that are increased in size by 2,000 square feet or more and exceed 50% of the area of the existing structure, located on parcels of land within the City of Newport Beach Hazard Reduction Zone and Local Very High Fire Hazard Severity Zones, shall be built in accordance with the regulations found in Section 4904 and 4905 of the Newport Beach Fire Code. The Fuel Modification Zone plan requires permanent vegetation management in dedicated land areas and is used indefinitely to facilitate on-going maintenance requirements. This standard covers the timing of plans for construction, plan criteria needed for approval, the approved plant list for the zones, inspection requirements, and introductory maintenance information. The Fuel Modification program brings fire-safe landscaping and construction features together to improve public safety and reduce property loss during wildfire emergencies.
See Guideline and Standards G.02 for large developments. NOTE: The vegetation requirements found in this guideline/standard only apply to those sides of the structure that face the wildland.

G.04.4 DEFINITIONS

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

CONVECTION HEAT - Transfer of heat by atmospheric currents, and is most critical under windy conditions and in steep terrain.

CROWN - Upper part of tree or other woody plant 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 or other woody growth.

DEFENSIBLE SPACE - An area either natural or man-made, where plant materials and natural fuels have been treated, reduced, or modified to slow the rate and intensity of an advancing wildfire, and to create an area for firefighters to suppress fire and protect structures.

DRIPLINE - Ground area at the outside edge of the canopy.

DROUGHT TOLERANCE - The ability of a plant or tree to survive on little water.

FINE FUELS - Fuels such as grass, leaves, and draped pine needles which, when dry, ignite readily and are consumed rapidly (also called flash fuels).

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 RESISTIVE 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. (List available on web page).

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 LOAD - The weight of fuels in a given area, usually expressed in tons per acre.

FUEL MODIFICATION PLAN - An approved plan or document which identifies specific fuel modification zones within a property that are subject to fuel modification. Fuel modification plans show the area and location of all hardscape/softscape improvements and fuel modification necessary to achieve the minimum acceptable level of risk to structures from fires in combustible vegetation.

FUEL MODIFICATION ZONE - A specific area where vegetation has been removed, planted, or modified in conjunction with an approved fuel modification plan that increases the likelihood that a structure will survive a wildfire, improve the defensible space around the structure for firefighting activities, and prevents direct flame contact with structures. Vegetation includes native and ornamental plants, non-native naturalized grasses, and other invasive or naturalized species. Fuel modification activities can include removal, partial or total replacement of existing

plants with adequately spaced drought-tolerant and fire-resistive species, and thinning of existing native or ornamental species.

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.

HAZARD REDUCTION ZONE - Any geographical area designated by the Fire Chief in which structures directly abut a wildland space on one or more sides.

HORIZONTAL CONTINUITY - The extent or horizontal distribution of fuels at various levels or planes.

LADDER FUELS - Fuels which provide vertical continuity between strata. Fire is able to carry from surface fuels by convection into the 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.

LONG TERM - In perpetuity of the fuel modification plan requirement.

NONCOMBUSTIBLE – Material at which no part will ignite and burn when subjected to fire.

PROBABILITY OF IGNITION - A rating of the probability that a firebrand (glowing or flaming) will cause a fire, providing it lands on receptive fuels. It is calculated from air temperature, fuel shading, and fuel moisture.

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.

TARGET SPECIES - Undesirable species that are generally removed as part of the fuel modification plan (see undesirable species).

VERTICAL CONTINUITY - The proximity of fuels to each other that governs the fire's capability to sustain itself. Vertical continuity applies to the relationship of aerial fuels to surface fuels or fuels low to the ground.

VERY HIGH FIRE HAZARD SEVERITY ZONE (Local Agency) - A geographical area designated in accordance with the California Government Code Section 51179, and by the City of Newport Beach Ordinance, which contains the type and condition of vegetation, topography, climate and structure density which potentially increases the possibility of uncontrolled fire spread through vegetative fuels threatening life or property. For the purposes of this standard and

municipal code, Local Agency Very High Fire Hazard Severity Zones shall be considered to be Very High Fire Hazard Severity Zones as defined in Government Code Section 51179.

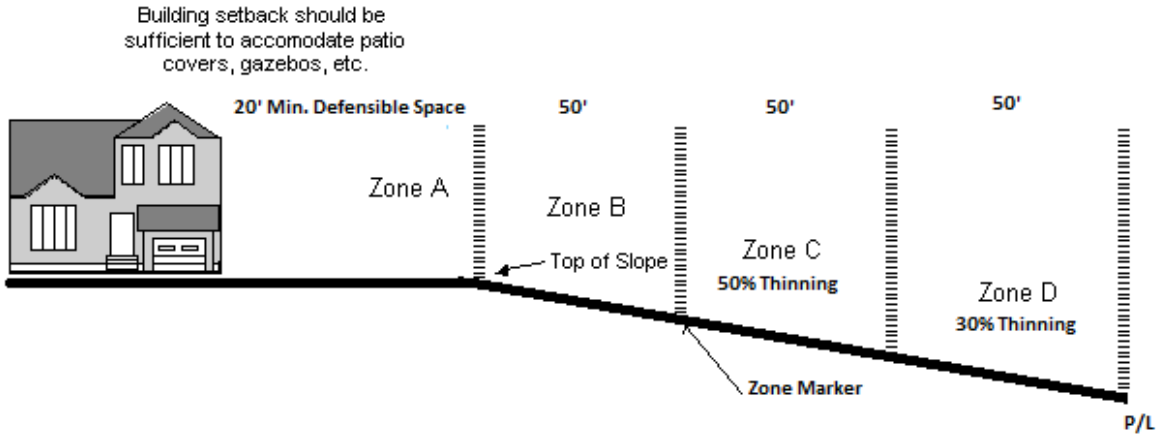
WILDLAND - An area of unimproved property with vegetative fuels in which development is essentially nonexistent, except for roads, railroads, power lines, and similar facilities.

WILDLAND FUELS - Any combustible material in a wildland area.

WILDLAND-URBAN INTERFACE (WUI) - A geographical area where improved property intersects with wildland or vegetative fuels.

G.04.5 FUEL MODIFICATION ZONE REQUIREMENTS

The 170 Foot width consists of the following zones:



ZONE "A" – Setback Irrigated Zone: 20-Foot Minimum Width (level-ground building foundation setback):
The purpose of the setback zone is to provide a defensible space for fire suppression forces and to protect structures from radiant heat and convective heat. No combustible construction shall be allowed within the 20-foot setback zone (Zone A). This zone is to be located on a level graded area where possible, at the top or base of slope and immediately adjacent to the protected development.

- Flat level ground where possible. If not possible, alternative designs may be accepted.
- Automatic irrigation systems to maintain healthy vegetation with high moisture content.
- Pruning of foliage to reduce fuel load, vertical continuity, and removal of plant litter and dead wood.
- Plants shall be highly fire resistant and selected from the approved fire resistant plant list for the setback zone and given geological area.

- Complete removal of combustible plant species. (See Attachment 6)
- Tree species are not allowed within 10 feet of combustible structures.
- Setback from the slope to the nearest building foundation.
- No combustible construction allowed in setback.
- No wood or solid fuel burning fireplaces, fire pits, or similar fire features in any zone.

ZONE "B" (50 -150 Feet Wide)

This portion of fuel modification consists of irrigated landscaping. The plans must delineate that portion of the fuel modification area that will be permanently irrigated. Plant material selection, irrigation system design, and the landscape maintenance management plan shall sensitively address water conservation practices and include 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 Quercus (Oak) species. These irrigated zones are a minimum of 50 feet in width and may be increased as conditions warrant. Zone B shall be cleared of all combustible plant species, irrigated, and planted with plants from the approved Fire Resistant Plant List. Exceptions to save desirable species may be submitted for approval by the City on a site-specific basis. As in Zone A, combustible construction is not allowed in Zone B.

- Required at the nearest slope from the foundation adjoining Zone A.
- Irrigated, and planted per Attachment 5.
- Removal of undesirable plant species (see Attachment 6)
- With the exception of specimen native vegetation approved for retention, irrigated surface fuels shall be maintained at a height not to exceed 24 inches.
- Native grasses, when used, shall be cut after annual seeding. Heights shall not exceed 8 inches.
- Irrigation shall be designed to supplement native vegetation, and establish and maintain planted natives and ornamentals.
- Planting shall be in accordance with planting and spacing standards established in this guideline (see Attachment 5).
- In Zones B, C, and D, sensitive and/or protected species shall be identified on the fuel modification plans and tagged in the field for further disposition.
- Trees and large tree-form shrubs (e.g. Oaks, Sumac, Toyon) which are being retained with the approval of the City shall be pruned and maintained to provide a clearance of **three times the height of the under story plant material** (see Attachment 5). Dead and excessively twiggy growth shall also be removed.
- All new and existing plant or plant groupings except cacti, succulents, trees, irrigated surface fuels under 24 inches, and tree-form shrubs shall be separated by a distance of **three times the height of the mature plant material or 10 feet**, whichever is higher (see Attachment 5).
- Special consideration should be given for rare and endangered species, and geological hazards.
- Non-irrigated design option can be proposed with special design considerations.
- When approved, temporary irrigation may be utilized to establish new plants, dependent on plant species, in lieu of permanent irrigation.

ZONE "C/D" (0-100 Feet Wide)
Zone C is 50 feet in width and requires 50% thinning and removal of all dead and dying and undesirable species. Zone D is 50 feet in width and requires 30% thinning and removal of all dead and dying growth and undesirable species. Thinning zones are utilized to reduce the fuel load of a wildland area adjacent to the structure(s), thereby reducing the radiant and convective heat of wildland fires. Thinning zones are located adjacent to the irrigated zone and can extend 100 feet or more into the wildland areas. The percentage of vegetation to be removed is determined by many factors, including topography, exposure, and vegetation type and density.

- Zone "C" 50 feet minimum width, 50% thinning.
- Zone "D" (where applicable) 50 feet minimum width, 30% thinning.
- Removal of all dead and dying vegetation, all fine fuels reduced and maintained to a maximum of 8-12 inches in height.
- Native grasses, when used, shall be cut after annual seeding. Heights shall not exceed 8 inches.
- Reduce fuel loading by reducing the 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.
- Trees and shrubs shall be planted and maintained per Attachment 5.

G.04.6 INFORMATION REQUIRED ON FUEL MODIFICATION PLANS

Conceptual Fuel Modification Plans

Conceptual plans are not required to be submitted if the designer is prepared to submit Precise Fuel Modification planting plans. Plans shall be prepared by a licensed landscape architect or other design professional with equivalent credentials. Initially submit only one set of plans. The final submittal shall include three sets of paper plans.

The following information shall be included on Conceptual and Precise Fuel Modification Plans:

Check each off after providing the information on the plan:

- Identify the total size of the development by showing all property lines, slope contour lines, and structure foundation footprints.
- Address of Project.
- Name, address, and phone number of individual who prepared plans on each sheet.
- Site plan showing size of property, property lines and dimensions, all buildings on the lot, front/rear/side yard setbacks (required, existing, and proposed), sidewalks, easements, and projections into setbacks such as stairs, fences, walls, air conditioning equipment, electrical equipment, windows, fireplace, etc. (Note: min. 3' clear side yard access on both sides of structure is required for firefighter access/egress at all times. Exception: residential refuse cans.

- Place descriptive notes of the land uses adjoining the development property on all sides. *(i.e., future construction, existing structures, natural vegetation, roads, parks, etc.).*
- Notate the zones as irrigated or non-irrigated landscaping.
- Provide the entity name(s) responsible for maintenance of the Fuel Modification Zone.
- Show name and location of any existing plant species you are proposing to retain. *(If none is shown, existing vegetation is considered not proposed and shall be removed from the site).*
- Provide plant palette legend per G.04.8
- Copy attachments 2, 5, and 6 on the plans for on-going maintenance requirements.

Copy the following notes on the plans:

- "The builder will obtain planting plan/fuel modification zone approval prior to receiving final approval from all other city departments." (Building, Planning, Public Works, etc.)
- "The Fuel Modification Zone shall be maintained in perpetuity for fire safety purposes."
- "A minimum three foot unobstructed side yard clearance shall be provided on both sides of structure for firefighter access. Only refuse cans for residential use may encroach into side yard setback."

G.04.7 PRECISE FUEL MODIFICATION PLANS

The Precise Fuel Modification plans shall include all information criteria required in Section G.04.6 and this standard. Plans shall be prepared by a licensed landscape architect or other design professional with equivalent credentials. The final plans submittal shall include three sets of paper plans. NOTE: Approval of a fuel modification plan does not eliminate the requirement to obtain appropriate environmental, grading, zoning, or any other required clearance/permits. Plans shall be submitted to and approved by the fire code official prior to the issuance of a building permit. A fuel modification permit will be issued by the Building Division upon approval of the plans.

The following information shall be included on the Precise Fuel Modification Plan:

A. Show the location of permanent zone markers. *(The goal is to install the lowest number of markers possible to ensure maintenance workers can delineate the different zones when thinning vegetation. Generally, markers are only required to indicate the location of each zone).*

B. Provide the degree or percentage of slope on the plan at the location of the zone markers to indicate the actual distance the marker shall be placed when using Attachment 3.

C. Copy Attachments 1, 2, 4, 5, 6, on the plans.

D. Irrigation plan sheets submitted to indicate that an irrigation system is being designed and installed, to meet city requirements (if applicable).

E. Plant Palette Legend per G.04.8

F. Erosion control measures proposed during FMZ construction shall be noted on the FMZ plans.

G. Create a heading titled "Required Inspection" then copy Attachment 1 on the plans underneath the heading.

H. Ensure the notes and sections from the conceptual plan requirements, if applicable, are copied to the precise plan.

G.04.8 PLANT PALETTE INFORMATION

A. The plant species from Attachment 7 were approved by various resource agencies responsible for environmental protection. All plants installed shall be selected from Attachment 7 and be grouped and spaced for initial installation in accordance with Attachment 5. Specific installation requirements are included for various plant species. (See plant code, legend, and qualification statements in Attachment 7). Retained plants shall be proposed for approval on the conceptual FMZ plans (See below for proposing alternate plant species). All plant species must be submitted in separate legends on the plans containing both the botanical and common names; and the expected mature width and height based on common published resources.

Provide a <u>separate plant palette legend for each bulleted point</u> below:

- Trees
- Shrubs
- Ground Cover (Maximum natural growth height 2 feet)
- Grasses
- Show any plants not on the Attachment 7 list

1. The legends shall include the common name, and the botanical name.
2. The legends shall indicate the expected mature height and width of each species.

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 7. (All plants, including species from Attachment 7, will burn given sufficient heat and low moisture content. Vegetative fire resistance may be enhanced through adequate irrigation rates).

B. **<u>Proposing Alternate Species:</u>**
If alternate plant species are proposed, the landscape architect shall provide photographs, data on the size and fire resistive characteristics, and data on the invasiveness for installation criteria. The landscape architect is responsible for demonstrating why the plant is similar to the probability of ignition and burning time to plants currently on the list. Additionally,

plants that are equal in combustibility may not be allowed due to the invasiveness of that particular species.

A maximum of 10 alternate species can be proposed per project. Plant selections need to have similar/equal properties to the plants from Attachment 7. The fire code official 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. Contact the fire code official prior to your submittal if needed.

G.04.9 ALTERNATIVE DESIGNS

If there are limited areas in which you cannot meet fuel modification width distance requirements, follow the performance based design direction below for the conceptual FMZ plans:

Performance Based Design

A detailed technical fire behavior analysis report by a qualified wildland fire behavior professional is required. (Qualifications of the professional are required to be approved by the fire code official prior to their design). The report shall include Behave Plus fuel modeling outputs at a minimum.

- Accompanying the detailed technical report also requires a one to two page maximum Alternative Materials and Methods (AM & M) request letter to the fire code official. The report and letter shall be drafted by the fire behavior professional and submitted with the plans.
- The applicant shall propose compensating factors to demonstrate equivalency to the distance required. (See building construction features and fire protection plans below)
- If an alternative means of protection is approved by the fire code official, an AM & M response letter will be drafted by the fire code official. Copy both your AM & M request letter, and the fire code official response letter onto the plans. You will be required to resubmit the plans again for review and final approval.

Building Construction Features and Fire Protection Plans

- Building construction features designed in accordance with Chapter 7A of the California Building Code (CBC) is required for all applicable structures.
- Additional compensating factors may also be required. These include, but are not limited to: Additional building construction features, solid fencing, block wall fencing, attic sprinklers, further distance of structure setbacks, and special planting designs.
- Refer to Guideline and Standard G.03 “Construction Requirements for Very High Fire Hazard Severity and Hazard Reduction Zones” for general construction requirements.

A “Fire Protection Plan” shall be submitted with the conceptual FMZ plan when alternate or performance based designs are used.

Attachment 1

The builder or developer shall call 949-644-3255
For final inspections, a permit number will be required:

1. **Prior to Occupancy of the Building: Schedule a "Final Fuel Modification" Inspection:**
   The FMZ must be installed, irrigated (if applicable), 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 Inspector will provide written approval of completion at the time of the final inspection approval on the building card. A written disclosure will be requested by the fire Inspector indicating that the homeowner is aware of the fuel modification zone on their land.

   - At the time of completion, the fuel modification area shall be maintained by the builder or owner as originally installed and approved.
   - A copy of the approved plans must be provided to the homeowner at final approval.
   - The landscape architect must convey ongoing maintenance requirements to the homeowner.
   - A written disclosure will be required to be signed by the homeowner indicating that the homeowner is aware of the fuel modification zone on their land and that they are aware of the importance of retaining the plans, and the on-going maintenance.
   - The responsibility and necessary language for maintenance must also be stated whenever the property is transferred or sold to another entity.

Attachment 2

Introductory Maintenance Information

The Fuel Modification Zones shall be maintained in perpetuity for fire safety purposes,

Maintenance Method

On-going maintenance shall occur as to preserve the originally approved design as found on the approved plans. Attachment 5 spacing is required and only approved planting species and arrangements on the plans are perpetually preserved.

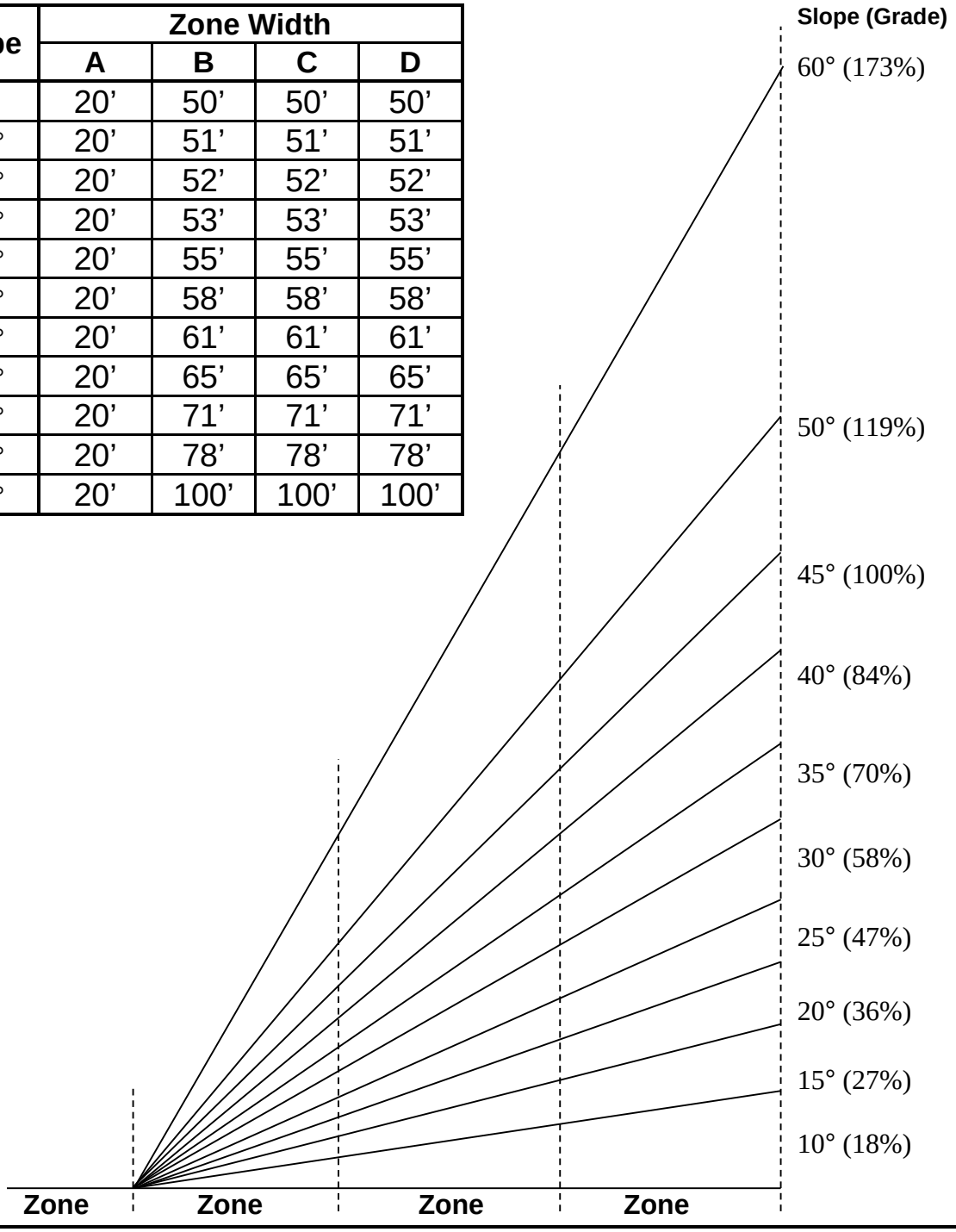
- The property owner is responsible for all maintenance of FMZ.
- Perform maintenance sometime within time periods of middle to late spring and once again in early to middle fall. Courtesy letters may be sent indicating the date of inspection.
- Other activities include: Grasses are cut to 4 inches after annual seeding. Dead and dying, all vegetation litter, and Attachment 6 species removed from the zones. Maintenance of irrigation systems. Replacement of dead or dying vegetation with approved species. Removal of trees and shrubs not on the approved plans.
- The City will conduct inspections of established fuel modification areas. Ongoing maintenance shall be conducted to maintain the area per the approved fuel modification plans. Typically, 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 shall be used to perform the maintenance.
- It is the seller's responsibility to transfer/provide the approved plans and maintenance requirements to all future owners.

Attachment 3

INCLINE MEASUREMENT FOR SELECTED SLOPES

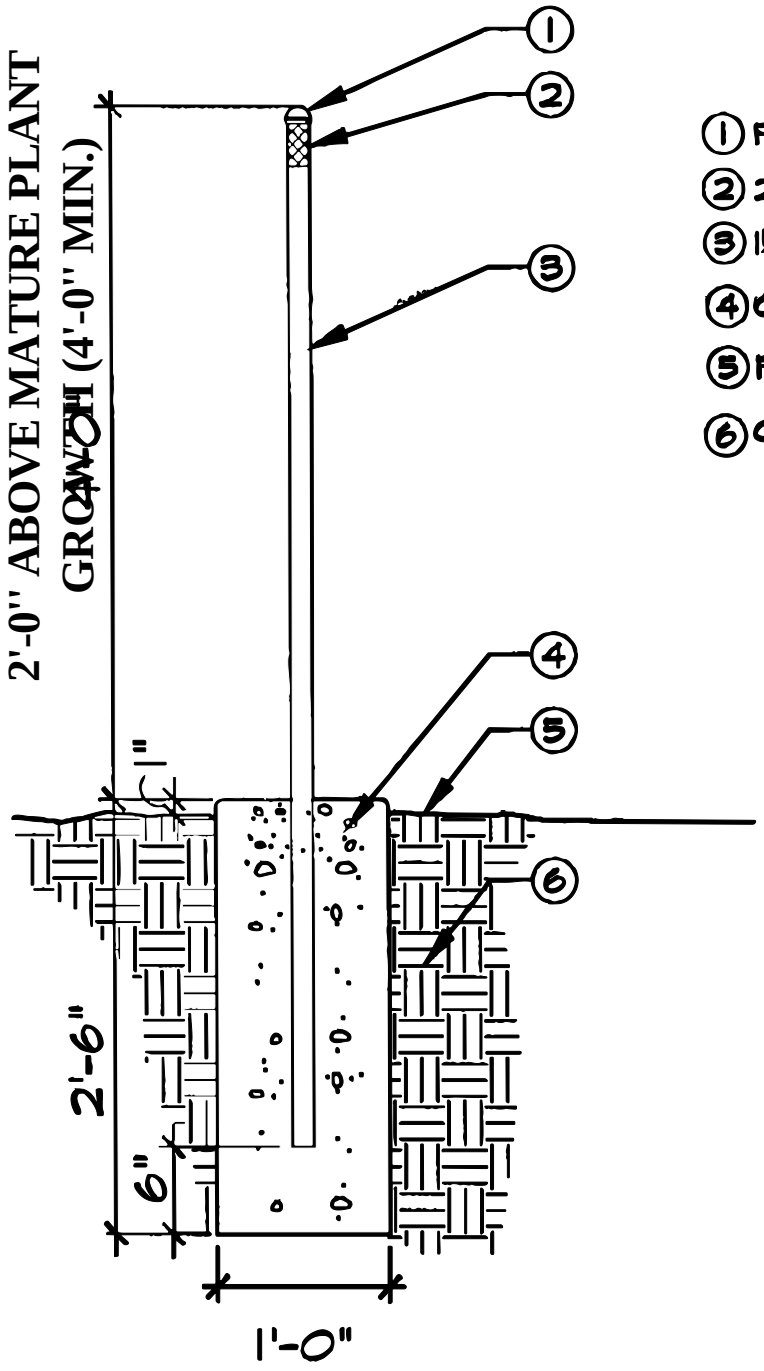
(See Attachment 4)

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)

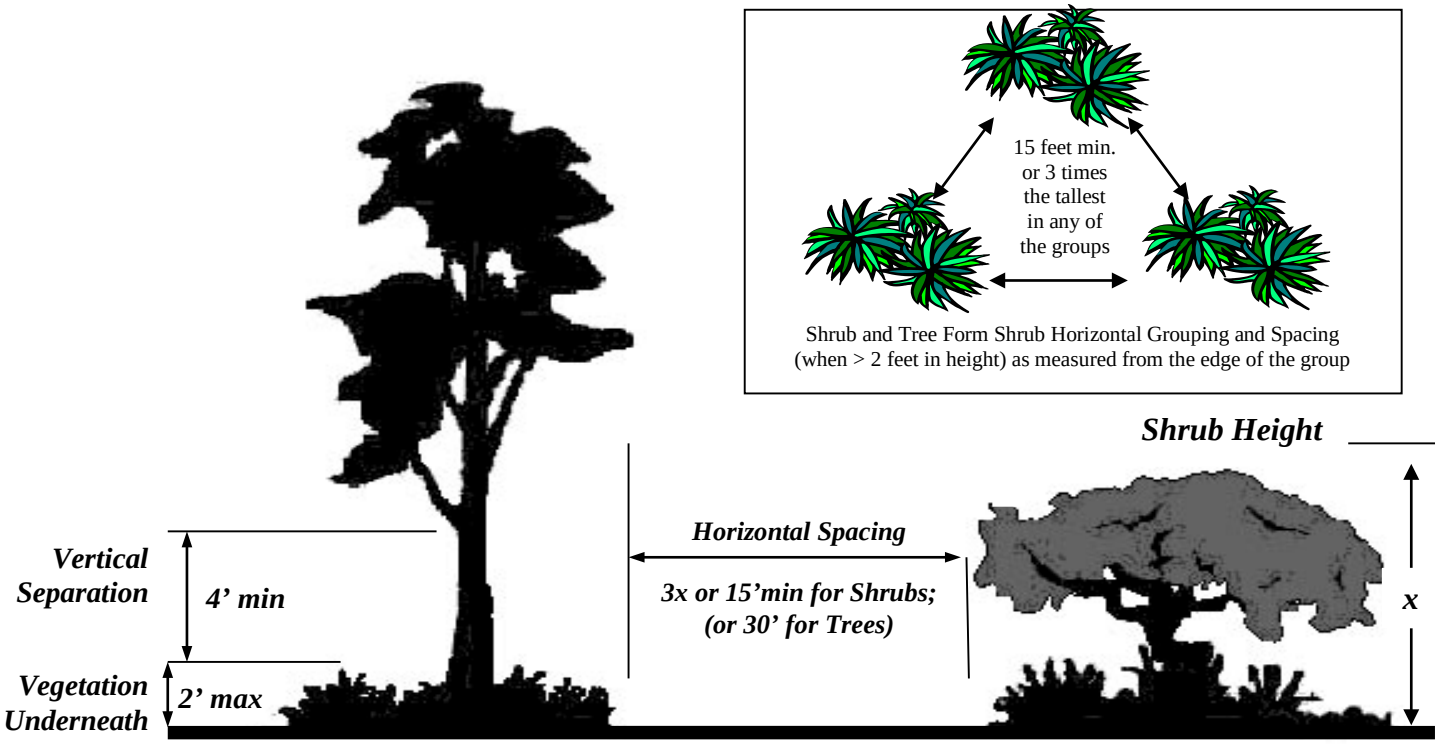


1. POST CAP
2. 2"X3" ZONE INDICATOR
3. 1½" DIA. GALV. POST.
4. CONC. FTG. 2500 PSI @ 28 DAYS.
5. FINISH GRADE.
6. COMPACTED SUBGRADE

Attachment 5

Requirements for Planting Installation in Fuel Modification Zones

(For on-going requirements, see Attachment 2, of Fuel Modification Standard G.04)



Horizontal Spacing

Vegetation Less than 2 Feet in Height:

- No horizontal spacing or vertical separation is required. Ground cover shall not exceed 2 feet in height. In Zone B, ground cover shall cover the entire ground between groups of shrubs, trees, or grasses. Grasses are not considered ground cover. Limited compartments of grasses are acceptable as approved on the planting plans. In Zone C/D grasses can cover the entire area.

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. In Zone 'A" full growth tree branches are not allowed within 10 feet of enclosed combustible structures.

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 6

UNDESIRABLE and INVASIVE PLANT SPECIES

Certain plants are considered to be undesirable and invasive due to their characteristics. 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 their invasiveness or potential threat they pose to any structures.

PLANT SPECIES (MANDATORY REMOVAL)

Botanical Name	Common Name
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
Nassella/Stipa Tenuissima	Mexican Feathergrass
Ornamental:	
Cortaderia	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine
Arecaceae (all palm sp)	Palms

Attachment 7

FUEL MODIFICATION ZONE PLANT LIST

(Note: Legend can be found on page 28)

	Code	Botanical Name	Common Name	Plant Form
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
21.	W	Anigozanthus flavidus	Kangaroo Paw	Perennial/accent
22.	o	Antirrhinum nuttalianum ssp.	no common name	Subshrub

23.	X	Aptenia cordifolia x ‘Red Apple’	Red Apple Aptenia	Ground cover
24.	W	Arbutus unedo	Strawberry Tree	Tree
25.	W	Arctostaphylos ‘Pacific Mist’	Pacific Mist Manzanita	Ground Cover
26.	W	Arctostaphylos edmundsii	Little Sur Manzanita	Ground Cover
27.	o	Arctostaphylos glandulosa ssp.	Eastwood Manzanita	Shrub
28.	W	Arctostaphylos hookeri ‘Monterey Carpet’	Monterey Carpet Manzanita	Low Shrub
29.	N	Arctostaphylos pungens	no common name	Shrub
30.	N	Arctostaphylos refugioensis	Refugio Manzanita	Shrub
31.	W	Arctostaphylos uva-ursi	Bearberry	Ground Cover
32.	W	Arctostaphylos x ‘Greensphere’	Greensphere Manzanita	Shrub
33.	N	Artemisia caucasica	Caucasian Artesmisia	Ground Cover
34.	X	Artemisia pycnocephala	Beach Sagewort	Perennial
35.	X	Atriplex canescens	Four-Wing Saltbush	Shrub
36.	X	Atriplex lentiformis ssp. breweri	Brewer Saltbush	Shrub
37.	o	Baccharis emoyi	Emory Baccharis	Shrub
38.	W o	Bacharis pilularis ssp. Consanguinea	Chaparral Bloom	Shrub
39.	X	Baccharis pilularis var. pilularis	Twin Peaks #2’	Ground Cover
40.	o	Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground Cover
42.	**N n**	Bougainvillea spectabilis	Bougainvillea	Shrub
43.	**o**	Brickellia californica	no common name	Subshrub
44.	W o	Bromus carinatus	California Brome	Grass
45.	o	Camissonia cheiranthifiloa	Beach Evening Primrose	Perennial Shrub
46.	N	Carissa macrocarpa	Green Carpet Natal Plum	Ground Cover/Shrub
47.	X	Carpobrotus chilensis	Sea Fig Ice Plant	Ground Cover
48.	W	Ceanothus gloriosus ‘Point Reyes’	Point Reyes Ceanothus	Shrub

49.	W	Ceanothus griseus 'Louis Edmunds'	Louis Edmunds Ceanothus	Shrub
50.	W	Ceanothus griseus horizontalis	Yankee Point	Ground Cover
51.	W	Ceanothus griseus var. horizontalis	Carmel Creeper Ceanothus	Shrub
52.	W	Ceanothus griseus var. horizontalis	Yankee Point Ceanothus	Shrub
53.	o	Ceanothus megarcarpus	Big Pod Ceanothus	Shrub
54.	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
55.	o	Ceanothus spinosus	Green Bark Ceanothus	Shrub
56.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
57.	W	Cerastium tomentosum	Snow-in-Summer	Ground cover/Shrub
58.	W	Ceratonia siliqua	Carob	Tree
59.	W	Cercis occidentalis	Western Redbud	Shrub/Tree
60.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Ground Cover
61.	W	Cistus Crispus	no common name	Ground Cover
62.	W	Cistus hybridus	White Rockrose	Shrub
63.	W	Cistus incanus	no common name	Shrub
64.	W	Cistus incanus ssp. Corsicus	no common name	Shrub
65.	W	Cistus salviifolius	Sageleaf Rockrose	Shrub
66.	W	Cistus x purpureus	Orchid Rockrose	Shrub
67.	W	Citrus species	Citrus	Tree
68.	o	Clarkia bottae	Showy Fairwell to Spring	Annual
69.	o	Cneoridium dumosum	Bushrue	Shrub
70.	o	Collinsia heterophyllia	Chinese Houses	Annual
71.	W o	Comarostaphylis diversifolia	Summer Holly	Shrub
72.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
73.	W	Coprosma kirkii	Creeping Coprosma	Ground Cover/Shrub
74.	W	Coprosma pumila	Prostrate Coprosma	Low shrub

75.	o	Coreopsis californica	Califiornia Coreopsis	Annual
76.	W	Coreopsis lanceolata	Coreopsis	Ground Cover
77.	N	Corea pulchella	Australian Fuscia	Ground Cover
78.	W	Cotoneaster buxifolius	no common name	Shrub
79.	W	Cotoneaster congestus ‘Likiang’	Likiang Cotoneaster	Ground Cover/Vine
80.	W	Cotoneaster aprneyi	no common name	Shrub
81.	X	Crassula lactea	no common name	Ground Cover
82.	X	Crassula multicava	no common name	Ground Cover
83.	X	Crassula ovata	Jade Tree	Shrub
84.	X	Crassula tetragona	no common name	Ground Cover
85.	W o	Croton californicus	California Croton	Ground Cover
86.	X	Delosperma ‘alba’	White trailing Ice Plant	Ground Cover
87.	o	Dendromecon rigida	Bush Poppy	Shrub
88.	o	Dichelostemma capitatum	Blue Dicks	Herb
89.	N	Distinctis buccinatoria	Blood-Red Trumpet Vine	Vine/Climbing vine
90.	N	Dodonaea viscosa	Hopseed Bush	Shrub
91.	X	Drosanthemum floribundum	Rosea Ice Plant	Ground Cover
92.	X	Drosanthemum hispidum	no common name	Ground Cover
93.	X	Drosanthemum speciosus	Dewflower	Ground Cover
94.	o	Dudleya lanceolata	Lance-leaved Dudleya	Succulent
95.	o	Dudleya pulverulenta	Chalk Dudleya	Succulent
96.	W	Elaeagnus pungens	Silverberry	Shrub
97.	o	Encelia californica	California Encelia	Small Shrub
98.	o *	Epilobium canum [Zauschneria californica]	Hoary California Fuschia	Shrub
99.	o	Eriastrum Sapphirinum	Mojave Woolly Star	Annual
100.	N	Eriobotrya japonica	Loquat	Tree

101.	o	Eriodictycon crassifolium	Thick Leaf Yerba Santa	Shrub
102.	o	Eriodictycon trichocalyx	Yerba Santa	Shrub
103.	W o	Eriophyllum confertiflorum	no common name	Shrub
104.	W	Erythrina species	Coral Tree	Tree
105.	N	Escallonia species	Several varieties	Shrub
106.	W o	Eschscholzia californica	California Poppy	Flower
107.	X	Eschscholzia mexicana	Mexican Poppy	Herb
108.	N	Euonymus fortunei	Winter Creeper Euonymus	Ground Cover
109.	N	Feijoa sellowiana	Pineapple Guava	Shrub/Tree
110.	N	Fragaria chiloensis	Wild Strawberry/Sand Strawberry	Ground Cover
111.	o	Frankenia salina	Alkali Heath	Ground Cover
112.	W	Fremontondendron californicum	California Flannelbush	Shrub
113.	X	Gaillardia x grandiflora	Blanketflower	Ground Cover
114.	W	Galvezia speciosa	Bush Snapdragon	Shrub
115.	W	Garrya ellipta	Silktassel	Shrub
116.	X	Gazania hybrids	South African Daisy	Ground Cover
117.	X	Gazania rigens leucolaena	Training Gazania	Ground Cover
118.	o	Gillia capitata	Globe Gilia	Perrenial
119.	W	Gilia leptantha	Showy Gilia	Perrenial
120.	W	Gilia tricolor	Bird’s Eyes	Perrenial
121.	W	Ginkgo biloba	Maidenhair Tree	Tree
122.	o	Gnaphalium californicum	California Everlasting	Annual
123.	W	Grewia occidentalis	Starflower	Shrub
124.	o	Grindelia stricta	Gum Plant	Ground Cover
125.	**N n**	Hakea suaveolens	Sweet Hakea	Shrub
126.	**W**	Hardenbergia comptoniana	Lilac Vine	Shrub

127.	N	Heliathemum muutabile	Sunrose	Ground Cover/Shrub
128.	o	Helianthemum scoparium	Rush Rose	Shrub
129.	o	Heliotropium curassavicum	Salt Heliotrope	Ground Cover
130.	X	Helix Canariensis	English Ivy	Ground Cover
131.	W	Hesperaloe parviflora	Red Yucca	Perennial
132.	**o n**	Heteromeles arbutifolia	Toyon	Shrub
133.	X	Hypericum calycimum	Aaron's Beard	Shrub
134.	N	Iberis sempervirens	Edging Candytuft	Ground Cover
135.	N	Iberis umbellatum	Globe Candytuft	Ground Cover
136.	o	Isocoma menziesii	Coastal Goldenbush	Small Shrub
137.	o	Isomeris arborea	Bladderpod	Shrub
138.	W	Iva hayesiana	Poverty Weed	Ground Cover
139.	N	Juglans californica	California Black Walnut	Tree
140.	o	Juncus acutus	Spiny Rush	Perrenial
141.	o	Keckiella antirrhinoides	Yellow Bush Penstemon	Subshrub
142.	o	Keckiella cordifolia	Heart Leaved Penstemon	Subshrub
143.	o	Keckiella ternata	Blue Stemmed Bush Penstemon	Subshrub
144.	W	Kniphofia uvaria	Red Hot Poker	Perennial
145.	W	Lagerstroemia indica	Crape Myrtle	Tree
146.	W	Lagunaria patersonii	Primrose Tree	Tree
147.	X	Lamprathus aurantiacus	Bush Ice Plant	Ground Cover
148.	X	Lampranthus filicaulis	Redondo Creeper	Ground Cover
149.	X	Lampranthus spectabilis	Trailing Ice Plant	Ground Cover
150.	W	Lantana camara cultivars	Yellow Sage	Shrub
151.	W	Lantana montevidensis	Trailing Lantana	Shrub
152.	o	Lasthenia californica	Dwarf Goldfields	Annual

153.	W	Lavandula dentata	French Lavender	Shrub
154.	W	Leptospermum laevigatum	Australian Tea Tree	Shrub
155.	W	Leucophyllum frutescens	Texas Ranger	Shrub
156.	o	Leymus condensatus	Giant Wild Rye	Large Grass
157.	N	Ligustrum japonicum	Texas privet	Shrub
158.	X	Limonium pectinatum	no common name	Ground Cover
159.	X	Limonium perezii	Sea Lavender	Shrub
160.	**W n**	Liquidambar styraciflua	American Sweet Gum	Tree
161.	W	Liriodendron tulipfera	Tulip Tree	Tree
162.	X	Lonicera japonica ‘Halliana’	Hall’s Japanese Honeysuckle	Vining Shrub
163.	o	Lonicera subspicata	Wild Honeysuckle	Vining Shrub
164.	X	Lotus corniculatus	Bird’s Foot Trefoil	Ground Cover
165.	o	Lotus hermannii	Northern Woolly Lotus	Perennial
166.	o	Lotus scoparius	Deerweed	Shrub
167.	W	Lupinus arizonicus	Desert Lupine	Annual
168.	W	Lupinus benthamii	Spider Lupine	Annual
169.	o	Lupinus bicolor	Sky Lupine	Flowering annual
170.	o	Lupinus sparsiflorus	Loosely Flowered Annual Lupine/Coulter’s Lupine	Annual
171.	W	Lyonothamnus floribundus ssp. Asplenifolius	Fernleaf Ironwood	Tree
172.	W	Macadamia integrifolia	Macadamia Nut	Tree
173.	W	Mahonia aquifolium ‘Golden Abundance’	Golden Abundance Oregon Grape	Shrub
174.	W	Mahonia nevenii	Nevin Mahonia	Shrub
175.	o	Malacothamnus fasciculatus	Chapparal Mallow	Shrub
176.	X	Malephora luteola	Training Ice Plant	Ground Cover
177.	W	Maytenus boaria	Mayten Tree	Tree
178.	W	Melaleuca nesophila	Pink Melaleuca	Shrub

179.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
180.	o *	Mimulus species	Monkeyflower	Flower
181.	o	Mirabilis californica	Wishbone Bush	Perrenial
182.	N	Myoporum debile	no common name	Shrub
183.	W	Myoporum insulare	Boobyalla	Shrub
184.	W	Myoporum parvilfolium	no common name	Ground Cover
185.	W	Myoporum 'Pacificum'	no common name	Ground Cover
186.	o	Nassella (stipa) lepidra	Foothill Needlegrass	Ground Cover
187.	o	Nassella (stipa) pulchra	Purple Needlegrass	Ground Cover
188.	o	Nemophilia menziesii	Baby Blue Eyes	Annual
189.	X	Nerium Oleander	Oleander	Shrub
190.	o	Nolina cismontana	Chapparal Nolina	Shrub
191.	N	Nolina species	Mexican Grasstree	Shrub
192.	W	Oenothera belandieri	Mexican Evening Primrose	Ground Cover
193.	N	Oenothera hookeri	California Evening Primrose	Flower
194.	W	Oenothera speciosa	Show Evening Primrose	Perrenial
195.	X	Ophiopogon japonicus	Mondo Grass	Ground Cover
196.	o *	Opuntia littoralis	Prickly Pear	Cactus
197.	o *	Opuntia oricola	Oracle Cactus	Cactus
198.	o *	Opuntia prolifera	Coast Cholla	Cactus
199.	W	Osmanthus fragrans	Sweet Olive	Shrub
200.	X	Osteospermum fruticosum	Training African Daisy	Ground Cover
201.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
202.	W	Pelargonium peltatum	Ivy Geranium	Ground Cover
203.	X	Penstemon species	Beard Tongue	Shrub
204.	W	Photinia fraseria	no common name	Shrub

205.	W	Pistacia chinesis	Chinese Pistache	Tree
206.	X	Pittosporum undulatum	Victorian Box	Tree
207.	o	Plantago erecta	California Plantain	Annual
208.	**	Plantago insularis	Woolly Plantain	Annual
209.	X	Plantago sempervirens	Evergreen Plantain	Ground Cover
210.	W	Plantanus racemosa	California Sycamore	Tree
211.	W	Plumbago auritulata	Plumbago Cape	Shrub
212.	o	Popolus fremontii	Western Cottonwood	Tree
213.	X	Portulacaria afra	Elephant's Food	Shrub
214.	o	Potentilla glandulosa	Sticky Cinquefoil	Subshrub
215.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground Cover
216.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
217.	o	Prunus ilicifolia ssp. Ilicifolia	Holly Leafed Cherry	Shrub
218.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
219.	N	Punica granatum	Pomegranate	Shrub/Tree
220.	W	Puya species	Puya	Succulent/Shrub
221.	W	Pyracantha species	Firethorn	Shrub
222.	o	Quercus agrifolia	Coast Live Oak	Tree
223.	**o n** *	Quercus berberdifolia	California Scrub Oak	Shrub
224.	**o n** *	Quercus dumosa	Coastal Scrub Oak	Shrub
225.	X	Quercus engelmannii	Engelmann Oak	Tree
226.	X	Quercus suber	Cork Oak	Tree
227.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
228.	o	Rhamnus californica	California Coffee Berry	Shrub
229.	o	Rhamnus crocea	Redberry	Shrub
230.	o	Rhamnus crocea ssp. Ilicifolia	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 Goosebberry	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	Solanum douglasii	Douglas Nightshade	Shrub
258.	o	Solanum xantii	Purple Nightshade	Perennial
259.	W	Stenicarpus sinuatus	Firewheel Tree	Tree
260.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
261.	W	Strelitzia reginae	Bird of Paradise	Perennial
262.	o	Symphoricarpos mollis	Creeping Snowberry	Shrub
263.	W	Tecoma stans (Stenolobium stans)	Yellow Bells	Shrub/Small Tree
264.	X	Tecomaria capensis	Cape Honeysuckle	Ground Cover
265.	N	Teucarium chamedrys	Germander	Ground Cover
266.	N	Thymus serpyllum	Lemon Thyme	Ground Cover
267.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
268.	o	Trichosstems lanatum	Woolly Blue Curls	Shrub
269.	X	Trifolium hirtum ‘Hyron’	Hyron Rose Clover	Ground Cover
270.	X	Trifolium fragerum ‘O’Connor’s’	O’Connor’s Legume	Ground Cover
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

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.

42. 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.

125. 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.

132. 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.

160. 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 to be 30-foot minimum.

223. Quercus berberdifolia: Additional information may be required as directed by the City unless approved on the plan as shown.

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224. 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.

234. 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 City.

242. Salvia greggii: Additional information may be required as directed by the City unless approved on the plan as shown.

243. 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.