

FIRE PROTECTION TECHNICAL MEMORANDUM

To: Mahlon Tobias, Menifee 18 Holdings, LLC
From: Dudek Fire Protection Planning Team, Michael Huff, Principal
Subject: Garbani Project Fire Protection Planning Assessment
Date: May 10, 2023
Attachments: A: Fuel Modification Map
B: Prohibited Plant List
C: Recommended Plant List

This Fire Protection Technical Analysis documents preliminary fire protection planning assessments and related project constraints analysis and recommended features for the subject project.

1 Project Description

The Garbani Project (Project) proposes the development of 33 single family dwelling lots and one open space lot on a 9.6-acre site in the City of Menifee.

1.1 Existing Site Observations

Field visit conducted October 12, 2021.

Site

- There is limited vegetation onsite; most of the property is level and disced; coastal sage scrub is located on the southwest corner of the property.
- The Project site does not appear to have any active uses; past uses may have been agriculture-based.

Topography

- The site is relatively flat, with a slight upslope gradient in the southwest portion of the property.

Vicinity

- North of the project are developed Single Family Dwelling Unit subdivisions.
- East of the project is disced, vacant land with no apparent active uses.
- South of the project is a rural residential property on a large lot maintained free of native vegetation.

- West of the project is vacant land, also disced, with some sparse, mature ornamental trees; there are no apparent active uses; past uses may have been agricultural related. Along the western edge of the property is the 60' wide Kurt Street unimproved public right of way (future street) – 30' on site and 30' off site.
- Southwest of the property is a small hill, about 200' higher elevation than the project site; slopes are approximately 25% gradient and support coastal sage scrub vegetation.

1.2 Riverside County Fire Code Requirements

- Title 14 Section 1280, Part 9 of the California Fire Code 2022
- Chapter 7A- California Building Code
- California Residential Code Section R337 (Ignition Resistant Construction)
- California Fire Code Chapter 49
- 30-foot setback from property lines or road centerlines (or same practical effect) per 14 CCR Sec. 1276.01
- California Government Code, Sections 51175 through 51189
- California Public Resources Code Sections 4201 through 4204
- National Fire Protection Association Standards (NFPA) 13-D, 2016
- Riverside County Ordinances 787.9 and 460.151.
- Submission of Fuel Modification Plan for review and approval

California Fire Code (CFC) Sec. 4906 Vegetation Management regulations include the following (selective):

- The landscape plan shall include development and maintenance requirements for vegetation management adjacent to structures and roadways (4906.3 Landscape plans)
- Landscape plans shall delineate of the 30- and 100-foot fuel management zones from all structures (4906.3.1 Contents)
- Identification of irrigated areas (4906.3.1 Contents)
- All new vegetation shall be fire-resistant (4906.4 Vegetation)
- New trees shall be planted/maintained so that the drip line at maturity is a minimum of 10 feet from any combustible structure (4906.4.2 Trees)

1.3 Proposed Site Plan Review

Primary access

Primary access is proposed using Sherman Road on the eastern side of the Project, which is currently a gravel road, with direct access to Garbani Street.

Emergency access

- The two proposed points of access to the Project site have adequate separation to Sherman Road. Sherman Road requires upgrading to CFC fire apparatus access standards including surface, width, and load bearing capabilities.
- All on-site roads will comply with fire apparatus access requirements.

- Hydrants will need to be installed along Sherman Road and within the Project site itself.
- An emergency access driveway (28-foot width) is located between Lots 4 and 5 connecting Garbani Road and “B” Street (to be a dedicated fire access road and not shared with residential dwellings).

Internal circulation

- Direct access is provided to all structures;
- hose pulls do not appear to exceed 150’;
- roadway width is 60 feet, including curbside parking on both sides;
- roadway widths/turn radii to meet FD minimum requirements;
- no dead-end roadways.

Fuel modification/Irrigated Landscaping

The proposed site plan depicts designated irrigated fuel modification zones (FMZ) in the rear yards of SFD lots along the west and south sides of the Project, the side yards of SFD lots along Sherman Road, and the common Lot D. A fuel modification zone consisting of irrigated, low fuel plant materials with regular maintenance is proposed. Please refer to Attachment 1 (Fuel Modification Plan) for FMZ details.

All FMZs will be irrigated as a Zone 1 (typically 30 feet from structures). No non-irrigated Zone 2 FMZs are proposed (non-irrigated; typically 30 to 100 feet from structures). The area within five feet of structures (Zone 0) will be maintained as an ember resistant zone and include gravel, pavers, concrete or other noncombustible materials (no combustible bark or mulch). The Fuel Modification Plan will be submitted to Riverside County Fire Department (RVCFD) for review and approval.

The proposed Project vegetation management/fuel modification design includes the following features:

- 20 to 36-foot-wide onsite irrigated FMZ is proposed in the rear yards on the western boundary (future ROW to include paved roadway); a 30-foot wide offsite equivalent FMZ (existing condition) occurs adjacent to these lots; a 6-foot-tall masonry wall will be provided around the entire project; it will provide mitigation for reduced FMZ on lots 7 through 19.
- 56 to 58-foot-wide onsite irrigated FMZ is proposed in the rear yards on the southern boundary.
- 100-foot-wide combination onsite FMZ and adjacent paved ROW FMZ equivalent on the eastern boundary (47-to-49-foot wide onsite FMZ and paved roadway; 44-foot-wide existing dirt road offsite (future paved street).
- Up to 100-foot wide maintained FMZ proposed on common Lot D; HOA maintenance will be provided.
- North side of project is adjacent to paved roadway and existing residential development.
- Common area vegetation management conducted by the HOA is identified on the Fuel Modification Plan; area shall be maintained and irrigated.
- Fuel Modification areas maintained by homeowners are identified on the Fuel Modification Plan. Mulch shall not be placed in backyards unless irrigated and no closer than 5 inches from the house.
- Fuel modification areas will be maintained at least once annually and additionally as needed to ensure compliance with maintenance requirements. All fuel modification areas are to be kept free of invasive plants and any volunteer native shrubs. Weeds are to be maintained less than four inches in height.

Plant list

See the landscape plan for the proposed plant palette and maintenance requirements. Planting will be consistent with lower fire hazard plantings of species not commonly found on prohibited fuel modification zone plant lists (attached) and unless otherwise justified, will be consistent with the attached recommended plant list.

Structure exposures

Structures are constructed of ignition resistant materials and will be surrounded by irrigated and landscaped fuel modification zones (defensible space). Building exterior materials will consist of stucco or similar non-combustible products.

Construction standards

The construction of all structures within Tract 37450 will meet all wildland/interface standards. Design and construction will meet the requirements listed in 2019 edition of the CFC and CBC (or 2022 edition if applicable), with special adherence to Chapter 7A and CRC Section R337 regarding exterior construction materials, with local amendments adopted by RVCF. This will include all accessory structures such as decks, balconies, patios, covers, gazebos and fences; all will be built from non-combustible or ignition resistant materials.

Infrastructure

An NFPA 13D sprinkler system will be installed in all homes. Water will be supplied by EMWD. Access roads (including weight support and Opticom signalization), driveways, gates, Knox boxes will all be installed to comply with current codes/standards.

VHFHSZ construction standards

The following applicable standards for construction in a Very High Fire Severity Zone will be followed: Chapter 7A of the 2022 California Building Code (CBC), the 2022 edition of the California Residential Code (CRC) Section R337, and those amended by the City of Menifee.

1.4 Fire Environment Assessment

- Property is located within LRA Very High Fire Hazard Severity Zone (VHFHSZ); it is a small, isolated VHFHSZ not contiguous with any other FHSZ area.
- No evidence of recent fire on site; lack of vegetation and fuel continuity would prevent fire from traversing across the site.
- The project would be subject to an approaching wildland fire from the southwest during onshore wind conditions. However, terrain that slopes downward toward the site, the small size of the fuel bed and the vegetation densities are not consistent with a high intensity, sustained duration wildfire event.

Fuel load

- There is limited vegetation onsite; most of the property is level and disced; coastal sage scrub is located on the southwest corner of the property. The fuel that would present the wildfire threat once the Project is constructed is off-site and occurs primarily to the southwest.

- Fire behavior modeling was used to determine the effective fuel modification zone width of 30 feet.
 - Flame Length reduced from 24.7 to 1.6 feet.
 - Spread Rate reduced from 1.0 to 0.1 mph.
 - Fireline Intensity reduced from 6,023 to 15 BTU/ft/sec.

Climate and Wind patterns

Throughout southern California, and specifically at the project site, climate has a large influence on fire risk. The climate of Menifee and western Riverside County is typical of a Mediterranean area, with warm, dry summers and cold, wet winters. Temperatures average (average annual) around 61 °F and reach up to 100 °F during the summer. Precipitation has been averaging about 14 inches and typically occurs between December and March. The prevailing wind is an on-shore flow between 7 and 11 mph from the Pacific Ocean.¹

Fires can be a significant issue during summer and fall, before the rainy period, especially during dry Santa Ana wind events. The seasonal Santa Ana winds can be particularly strong in the Project area as warm and dry air is channeled from the dry, desert land to the east. Although Santa Ana events can occur anytime of the year, they generally occur during the autumn months, although the last few years have resulted in spring (April May) and summer events. Santa Ana winds may gust up to 75 miles per hour (mph) or higher. This phenomenon markedly increases the wildfire danger and intensity in the project area by drying out and preheating vegetation as well as accelerating oxygen supply, and thereby, making possible the burning of fuels that otherwise might not burn under cooler, moister conditions. However, based on the surrounding land uses and provided setbacks, along with the location of the nearest native fuel beds downwind of the Project during an extreme wind condition, the Project is considered to address the increased fire risk associated with the area’s climate extremes.

Table 1. Fire Behavior Modeling Results

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: 25% slope, 20 mph SW wind				
Fuel Model SCAL18 (CSS-Buckwheat)	24.7	6,023	1.0	0.9
Scenario 1 Fuel Mod: 10% slope, 20 mph SW wind				
Fuel Model 8 (irrigated landscaping)	1.6	15	0.1	0.1

1.5 Recommendations

The Project will comply with applicable fire and building codes. The Project cannot provide 100 feet of FMZ onsite for all lots. Therefore, as an Alternative Materials and Methods approach, we recommend, and the Project is committed to provide:

1. Six-foot-tall CMU walls along the entire property line; walls will be provided mitigation for reduced FMZ on lots 7 through 19 that are adjacent to off-site areas with unmaintained fuels.

¹ Climate-data.org: <https://en.climate-data.org/north-america/united-states-of-america/california/menifee-51888/>

2. Windows on exposed sides of structures with less than 100 feet of FMZ would be dual tempered panes (exceeding Chapter 7A requirements of dual pane, one pane tempered).
3. Irrigated landscaping in the rear yards of lots 7 through 19.

Wall Justifications:

When buildings are set back from slopes, and a wall is placed at the property line, flames and radiant heat are deflected vertically reducing the effects of heat on the structure. If a structure cannot be setback adequately, or where the slope is less than 30%, a noncombustible wall can help deflect the flames from the structure (NFPA 2005). The duration of radiant heat impact on the exposed side of the house is also reduced. The structure setback is important to avoid heat and/or flame intersection with the structure.

Heat-deflecting landscape walls of masonry construction that are six feet in height will be incorporated at the edge of the property; where FMZs are the most constrained (Lots 7 through 19) they will mitigate reduced FMZs. The landscape walls provide a vertical, non-combustible surface in the line of heat, fumes, and flame. Once these fire byproducts intersect the wall, they are deflected upward or, in the case where lighter fuels are encountered, they are quickly consumed, heat and flame are absorbed or deflected by the wall, and the fuels burn peaks out within a short (30 second–2 minute) time frame (Quarles and Beall 2002). Walls like these have been observed to deflect heat and airborne embers on numerous wildfires in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara County.

Rancho Santa Fe Fire Protection District, Laguna Beach Fire Department, Orange County Fire Authority, and others utilize these walls as alternative methods based on observed performance during wildfires. This has led to these agencies approving use of non-combustible landscape walls as mitigations for reduced fuel modification zones and reduced setbacks at top of slope. These walls are consistent with NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2008 Edition, Section 5.1.3.3 and A.5.1.3.3 and International Urban Wildland Interface Code (ICC 2012). NFPA 1144, A.5.1.3.3 states: “Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures.” These walls and barriers are usually constructed of noncombustible materials (concrete block, bricks, stone, stucco) or earth where 30 feet (9 meters) of defensible space is not available.

Window Justification:

In addition to the construction of a six-foot high CMU wall, the Project proposes to provide exterior glazing in windows (and sliding glass doors, garage doors, or decorative or leaded glass doors) facing the untreated naturally vegetated areas to be dual pane with both panes tempered glass to mitigate for the reduced FMZ within Lots 7 through 19. Dual pane, one pane tempered glass has been shown during testing and in after fire assessments to significantly decrease the risk of breakage and ember entry into structures. Therefore, requiring code-exceeding dual pane, both panes tempered is anticipated to be an important safety measure that provides enhanced structure protection and provides mitigation for reduced fuel modification zones and limited setbacks from adjacent structures. The window upgrade also exceeds the requirements of Section R337 of the CRC and providing additional protection for the structure’s most vulnerable, exterior side.

1.6 Summary

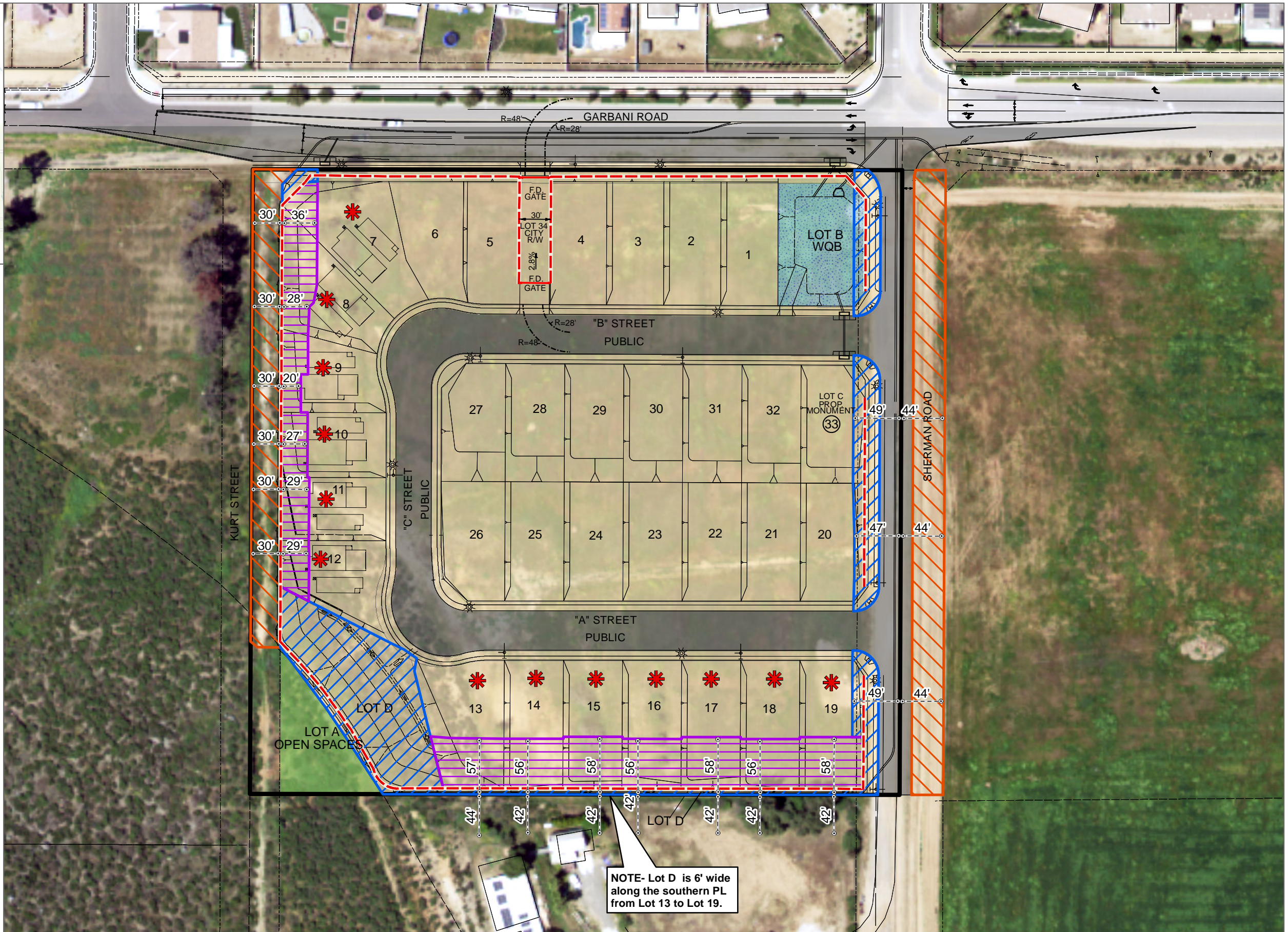
There are no significant onsite wildland fire hazard concerns. Offsite hazards to the southwest, and less so to the west, are present, but are able to be mitigated with project and building design. The proposed project design

includes customized FMZ with mitigating fire wall around the entire Project that will be designed to address and provide appropriate defensible space for expected fire behavior in adjacent native vegetation.

The internal circulation provides the necessary access to all structures with no dead ends that require fire department turnarounds. The roadway widths meet the minimum for buildings less than 30 feet in height.

The minimum two points of access to the project meet the code required separation distance. Sherman Road will be improved to meet the code requirements for a fire apparatus access road; hydrants will also be installed to code. The emergency access driveway will provide a secondary route to/from Garbani Road.

Attachment A
Fuel Modification Map



Project Boundary

Land

Development

WQ Basin

Open Space

Roadway

Future Right-of-Way

Fuel Modification

Onsite FMZ (irrigated - HOA maintained)

Onsite FMZ (irrigated - Homeowner maintained)

FMZ Equivalent

FMZ Dimension

6-Ft Fire Block Wall

Lots Requiring Dual Pane Windows on Structures (Both Panes Tempered on the Exposed Western Side of Structure)

FIRE NOTES:

1. There will be a 6-foot masonry wall around the entire project and it provides mitigation for Lots 7-19 reduced fmz.
2. Fuel Modification common area vegetation shall be maintained by the HOA. These areas will be irrigated, low fuel plant materials with regular maintenance.
3. Mulch shall not be placed in the backyards unless irrigated & no closer than 5 inches from the house.

NOTE- Lot D is 6' wide along the southern PL from Lot 13 to Lot 19.

Attachment B

Prohibited Plant List

FUEL MODIFICATION ZONE PROHIBITED PLANTS LIST

Botanical Name	Common Name	Comment*
Trees		
<i>Abies</i> species	Fir	F
<i>Agonis juniperina</i>	Juniper Myrtle	F
<i>Casuarina cunninghamiana</i>	River She-Oak	F
<i>Chamaecyparis</i> species (numerous)	False Cypress	F
<i>Cryptomeria japonica</i>	Japanese Cryptomeria	F
<i>Cupressocyparis leylandii</i>	Leyland Cypress	F
<i>Cupressus</i> species (<i>C. fobesii</i> , <i>C. glabra</i> , <i>C. sempervirens</i> ,)	Cypress (Tecate, Arizona, Italian, others)	F
<i>Eucalyptus</i> species (numerous)	Eucalyptus	F, I
<i>Juniperus</i> species (numerous)	Juniper	F
<i>Lithocarpus densiflorus</i>	Tan Oak	F
<i>Melaleuca</i> species (<i>M. linariifolia</i> , <i>M. nesophila</i> , <i>M. quinquenervia</i>)	Melaleuca (Flaxleaf, Pink, Cajeput Tree)	F, I
<i>Picea</i> (numerous)	Spruce	F
<i>Palm</i> species (numerous)	Palm	F, I
<i>Pinus</i> species (<i>P. brutia</i> , <i>P. canariensis</i> , <i>P. b. eldarica</i> , <i>P. halepensis</i> , <i>P. pinea</i> , <i>P. radiata</i> , numerous others)	Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)	F
<i>Platycladus orientalis</i>	Oriental arborvitae	F
<i>Pseudotsuga menziesii</i>	Douglas Fir	F
<i>Tamarix</i> species (<i>T. africana</i> , <i>T. aphylla</i> , <i>T. chinensis</i> , <i>T. parviflora</i>)	Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)	F, I
<i>Taxodium</i> species (<i>T. ascendens</i> , <i>T. distichum</i> , <i>T. mucronatum</i>)	Cypress (Pond, Bald, Monarch, Montezuma)	F
<i>Taxus</i> species (<i>T. baccata</i> , <i>T. brevifolia</i> , <i>T. cuspidata</i>)	Yew (English, Western, Japanese)	F
<i>Thuja</i> species (<i>T. occidentalis</i> , <i>T. plicata</i>)	Arborvitae/Red Cedar	F
Groundcovers, Shrubs & Vines		
<i>Acacia</i> species	Acacia	F, I
<i>Adenostoma fasciculatum</i>	Chamise	F
<i>Adenostoma sparsifolium</i>	Red Shanks	F
<i>Agropyron repens</i>	Quackgrass	F, I
<i>Anthemis cotula</i>	Mayweed	F, I
<i>Arctostaphylos</i> species	Manzanita	F
<i>Arundo donax</i>	Giant Reed	F, I
<i>Artemisia</i> species (<i>A. abrotanum</i> , <i>A. absinthium</i> , <i>A. californica</i> , <i>A. caucasica</i> , <i>A. dracunculus</i> , <i>A. tridentata</i> , <i>A. pynoccephala</i>)	Sagebrush (Southernwood, Wormwood, California, Silver, True tarragon, Big, Sandhill)	F
<i>Atriplex</i> species (numerous)	Saltbush	F, I
<i>Avena fatua</i>	Wild Oat	F
<i>Baccharis pilularis</i>	Coyote Bush	F
<i>Bambusa</i> species	Bamboo	F, I
<i>Bougainvillea</i> species	Bougainvillea	F, I
<i>Brassica</i> species (<i>B. campestris</i> , <i>B. nigra</i> , <i>B. rapa</i>)	Mustard (Field, Black, Yellow)	F, I

FUEL MODIFICATION ZONE PROHIBITED PLANTS LIST

Botanical Name	Common Name	Comment*
<i>Bromus rubens</i>	Foxtail, Red brome	F, I
<i>Castanopsis chrysophylla</i>	Giant Chinquapin	F
<i>Cardaria draba</i>	Hoary Cress	I
<i>Cirsium vulgare</i>	Wild Artichoke	F,I
<i>Conyza bonariensis</i>	Horseweed	F
<i>Coprosma pumila</i>	Prostrate Coprosma	F
<i>Cortaderia selloana</i>	Pampas Grass	F, I
<i>Cytisus scoparius</i>	Scotch Broom	F, I
<i>Eriogonum species (E. fasciculatum)</i>	Buckwheat (California)	F
<i>Fremontodendron species</i>	Flannel Bush	F
<i>Heterotheca grandiflora</i>	Telegraph Plant	F
<i>Hordeum leporinum</i>	Wild barley	F, I
<i>Juniperus species</i>	Juniper	F
<i>Lactuca serriola</i>	Prickly Lettuce	I
<i>Larrea tridentata</i>	Creosote bush	F
<i>Lolium multiflorum</i>	Ryegrass	F, I
<i>Lonicera japonica</i>	Japanese Honeysuckle	F
<i>Mimulus aurantiacus</i>	Sticky Monkeyflower	F
<i>Miscanthus species</i>	Eulalie Grass	F
<i>Muhlenbergia species</i>	Deer Grass	F
<i>Nicotiana species (N. bigelovii, N. glauca)</i>	Tobacco (Indian, Tree)	F, I
<i>Pennisetum setaceum</i>	Fountain Grass	F, I
<i>Perovskia atroplicifolia</i>	Russian Sage	F
<i>Phoradendron species</i>	Mistletoe	F
<i>Pickeringia montana</i>	Chaparral Pea	F
<i>Rhus (R. diversiloba, R. laurina, R. lentii)</i>	Sumac (Poison oak, Laurel, Pink Flowering)	F
<i>Ricinus communis</i>	Castor Bean	F, I
<i>Rhus Lentii</i>	Pink Flowering Sumac	F
<i>Salvia species (numerous)</i>	Sage	F, I
<i>Salsola australis</i>	Russian Thistle	F, I
<i>Solanum Xantii</i>	Purple Nightshade (toxic)	I
<i>Silybum marianum</i>	Milk Thistle	F, I
<i>Thuja species</i>	Arborvitae	F
<i>Urtica urens</i>	Burning Nettle	F

*F = flammable, I = Invasive

Notes:

- Plants on this list that are considered invasive are a partial list of commonly found plants. There are many other plants considered invasive that should not be planted in a fuel modification zone and they can be found on The California Invasive Plant Council's Website www.cal-ipc.org/ip/inventory/index.php. Other plants not considered invasive at this time may be determined to be invasive after further study.
- For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
- The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
- All vegetation used in Fuel Modification Zones and elsewhere in this development shall be subject to approval of the Fire Code Official.
- Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

Attachment C

Recommended Plant List

Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
1.	W	<i>Abelia x grandiflora</i>	Glossy Abelia	Shrub
2.	–	<i>Acacia redolens</i> desert carpet	Desert Carpet	Shrub
3.	–	<i>Acer macrophyllum</i>	Big Leaf Maple	Tree
4.	X	<i>Achillea millefolium</i>	Common Yarrow	Low shrub
5.	W	<i>Achillea tomentosa</i>	Wolly Yarrow	Low shrub
6.	X	<i>Aeonium decorum</i>	Aeonium	Ground cover
7.	X	<i>Aeonium simsii</i>	Aeonium	Ground cover
8.	W	<i>Agaave attenuata</i>	Century Plant	Succulent
9.	W	<i>Agave shawii</i>	Shaw’s Century Plant	Succulent
10.	N	<i>Agave victoriae-reginae</i>	Agave	Ground cover
11.	X	<i>Ajuga reptans</i>	Carpet Bugle	Ground cover
12.	W	<i>Alnus cordata</i>	Italian Alder	Tree
13.	–	<i>Alnus rhombifolia</i>	White Alder	Tree
14.	N	<i>Aloe aborescens</i>	Torch Aloe	Shrub
15.	N	<i>Aloe aristata</i>	Dwarf Aloe	Ground cover
16.	N	<i>Aloe brevisfolia</i>	Aloe	Ground cover
17.	W	<i>Aloe Vera</i>	Medicinal Aloe	Succulent
18.	W	<i>Alyogyne huegelii</i>	Blue Hibiscus	Shrub
19.	–	<i>Ambrosia chamissonis</i>	Beach Bur-Sage	Perennial
20.	–	<i>Amoroha fruticosa</i>	Western False Indigobush	Shrub
21.	W	<i>Anigozanthus flavidus</i>	Kangaroo Paw	Perennial Accent
22.	–	<i>Antirrhinum nuttalianum</i> ssp. <i>Nuttatianum</i>	Beard Tongue	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 edmundsil</i>	Little Sur Manzanita	Ground cover
27.	–	<i>Arctostaphylos glandulosa</i>	Eastwood Manzanita	Shrub
28.	W	<i>Arctostaphylos hookeri</i> ‘Monterey Carpet’	Monterey Carpet Manzanita	Low shrub
29.	N	<i>Arctostaphylos pungens</i>	Heather	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>Atemisia caucasia</i>	Caucasian Artemisia	Ground cover
34.	N	<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.	–	<i>Baccharis emoryi</i>	Emory Baccharis	Shrub
38.	W	<i>Baccharis pilularis</i> ssp. <i>Consanguinea</i>	Chaparral Bloom	Shrub

X = Plant Species prohibited in wet and dry fuel modification zones adjacent to native open space lands. Acceptable in all other fuel modification zones and locations.

W = Plant species appropriate for use in wet fuel modification zones adjacent to native open space lands. Acceptable in all other wet and irrigated dry (manufactured slopes) fuel modification zones and locations.

– = Plant species native to Riverside, Orange and San Diego Counties. Acceptable in all fuel modification (wet or dry zones) in all locations.

N = Plant species acceptable on a limited basis (maximum 30% of the area at time of planting) in wet fuel modification zones adjacent to native open space reserve lands. Acceptable in all other fuel modification zones and locations.

* = If seed collected from local seed source.

** = Not native plant species but can be used in all fuel modification zones.

***Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside,
Orange and San Diego Counties***

	Code	Botanical Name	Common Name	Plant Form
39.	X	Baccharis pilularis var. pilularis ‘Twin Peaks #2’	Twin Peaks	Ground cover
40.		Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground cover
42.	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small tree
43.	N	Bougainvillea spectabilis	Bougainvillea	Shrub
44.	N	Brahea armata	Mexican Blue Palm, Blue Hesper Palm	Palm
45.	N	Brahea brandegeei	San Jose Hesper Palm	Palm
46.	N	Brahea edulis	Guadalupe Palm	Palm
47.		Brickellia californica	Hoary Nettle	Subshrub
48.	W	Bromus carinatus	California Brome	Grass
49.		Camissonia cheiranthifolia	Beach Evening Primrose	Perennial subshrub
50.	N	Carissa macracarpa	Green Carpet Natal Plum	Ground cover/shrub
51.	X	Carpibrotus chilensis	Sea Fig Ice Plant	Ground cover
52.	W	Ceanothus gloriosus ‘Point Reyes’	Point Reyes Ceanothus	Shrub
53.	W	Ceanothus griseus ‘Louise Edmunds’	Louis Edmunds Ceanothus	Shrub
54.	W	Ceanothus griseus horizontalis	Yankee Point	Ground cover
55.	W	Ceanothus griseus var. horizontalis	Carmel Creeper Ceanothus	Shrub
56.		Ceanothus megacarpus	Big Pod Ceanothus	Shrub
57.	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
58.		Ceanothus spinosus	Green Bark Ceanothus	Shrub
59.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
60.	W	Cerastium tomentosum	Snow-in-summer	Ground cover/shrub
61.	W	Ceratonia siliqua	Carob	Tree
62.	W	Cercis occidentalis	Western redbud	Tree/Shrub
63.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Groundcover
64.	W	Cistus hybridus	White Rockrose	Shrub
65.	W	Cistus incanus	Mauve Rockrose	Shrub
66.	W	Cistus incanus salviaefolius	Sageleaf Rockkrose	Shrub
67.	W	Cistus purpureus	Orchid Rockrose	Shrub
68.	W	Citrus species	Citrus	Tree
69.		Clarkia bottae	Showy Fairwell to Spring	Annual
70.		Cneoridium dumosum	Bushrue, Pt. Reyes Ceanothus	Shrub
71.		Collinsia heterophylla	Chinese Houses	Annual
72.	W	Comarostaphylis diversifolia	Summer Holly	Shrub
73.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
74.	W	Coprosma kirkii	Creeping Coprosma	Ground cover/Shrub
75.	W	Coprosma pumila	Prostrate Coprosma	Low Shrub
76.		Coreopsis californica	California coreopsis	Annual
77.	W	Coreopsis lanceolata	Coreopsis	Ground cover

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78.	N	Correa pulchella	Australian Fushia	Ground cover
79.	W	Cotoneaster buxifolius	Grayleaf Cotoneaster	Shrub
80.	W	Cotoneaster congestus Likiang	Likiang Cotoneaster	Ground cover/Vine
81.	X	Crassula lactea	Taylor's Parches	Ground cover
82.	X	Crassula ovata	Jade Tree	Shrub
83.	X	Crassula tetragona	Jade Plant	Shrub
84.	W	Croton californicus	California Croton	Ground cover
85.	X	Delosperma 'alba'	White Trailing Ice Plant	Ground cover
86.		Dendromecon rigida	Bush Poppy	Shrub
87.		Dichelostemma capitatum	Blue Dicks	Herb
88.	N	Distictis buccinatoria	Blood-Red Trumpet Vine	Vine/Climbing vine
89.	N	Dodonaea viscosa	Hopseed Bush	Shrub
90.	X	Drosanthemum floribundum	Rosea Ice Plant	Ground cover
91.	X	Drosanthemum hispidum	Ice Plant, Showy Dewflower	Ground cover
92.		Dudleya lanceolat	Lance Leaved Dudleya	Succulent
93.		Dudleya pulverulenta	Chalk Dudleya	Succulent
94.	W	Elaeagnus pungens	Silverberry	Shrub
95.		Encelia californica	California Encelia	Small shrub
96.	A	Epilobium canum (Zauschneria californica)	Hoary California Fushia	Shrub
97.		Eriastrum sapphirinum	Mojave Woolly Star	Annual
98.	N	Eriobotrya japonica	Loquat	Tree
99.		Eriodictyon crassifolium	Thick-Leaf Yerba Santa	Shrub
100.		Eriodictyon trichocalyx	Mojave Woolly Star	Annual
101.	W	Eriophyllum confertiflorum	Golden Yarrow	Shrub
102.	W	Erythrina species	Coral Tree	Tree
103.	W	Eschscholzia californica	California Poppy	Flower
104.	X	Eschscholzia mexicana	Mexican Poppy	Herb
105.	N	Euonymus fortunei	Winter Creeper Euonymus	Ground cover
106.	N	Fiejoa sellowiana	Pineapple Guava	Shrub/Tree
107.	N	Fragaria chiloensis	Wild Strawberry/ Sand Strawberry	Ground cover
108.		Frankenia salina	Alkali Heath	Ground cover
109.	W	Fremontodendron californicum	California Flannelbush	Shrub
110.	X	Gaillardia x grandiflora	Blanketflower	Ground cover
111.	W	Galvezia speciosa	Bush Snapdragon	Shrub
112.	W	Garrya ellipta	Silktassel	Shrub
113.	X	Gazania hybrids	South African Daisy	Ground cover
114.	X	Gazania rigens leucolaena	Trailing Gazania	Ground cover
115.		Gilia capitata	Globe Gilia	Perennial
116.	W	Gilia lephantha	Showy Gilia	Perennial

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117.	W	<i>Gilia tricolor</i>	Bird's Eyes	Perennial
118.	W	<i>Ginko biloba</i>	Maidenhair Tree	Tree
119.		<i>Gnaphalium californicum</i>	California Everlasting	Annual
120.	W	<i>Grewia occidentalis</i>	Starflower	Shrub
121.		<i>Grindelia stricta</i>	Gum Plant	Ground cover
122.	N	<i>Hakea suaveolens</i>	Sweet Hakea	Shrub
123.	W	<i>Harde bergia comptoniana</i>	Lilac Vine	Shrub
124.	N	<i>Helianthemum mutabile</i>	Sunrose	Ground cover/Shrub
125.		<i>Helianthemum scoparium</i>	Rush Rose	Shrub
126.		<i>Heliotropium curassavicum</i>	Salt Heliotrope	Ground cover
127.	X	<i>Helix canariensis</i>	English Ivy	Ground cover
128.	W	<i>Hesperaloe parviflora</i>	Red Yucca	Perennial
129.		<i>Heteromeles arbutifolia</i>	Toyon	Shrub
130.	X	<i>Hypericum calcycinum</i>	Aaron's Beard	Shrub
131.	N	<i>Iberis sempervirens</i>	Edging Candytuft	Ground cover
132.	N	<i>Iberis umbellatum</i>	Globe Candytuft	Ground cover
133.		<i>Isocoma menziesii</i>	Coastal Goldenbush	Small shrub
134.		<i>Isomeris arborea</i>	Bladderpod	Shrub
135.	W	<i>Iva hayesiana</i>	Poverty Weed	Ground cover
136.	N	<i>Jublans californica</i>	California Black Walnut	Tree
137.		<i>Juncus acutus</i>	Spiny Rush	Perennial
138.		<i>Keckiella antirrhinoides</i>	Yellow Bush Penstemon	Subshrub
139.		<i>Keckiella cordifolia</i>	Heart Leaved Penstemon	Subshrub
140.		<i>Keckiella ternata</i>	Blue Stemmed Bush Penstemon	Subshrub
141.	W	<i>Kniphofia uvaria</i>	Red Hot Poker	Perennial
142.	W	<i>Lagerstroemia patersonii</i>	Crape Myrtle	Tree
143.	X	<i>Lampranthus aurantiacus</i>	Bush Ice Plant	Ground cover
144.	X	<i>Lampranthus filicaulis</i>	Redondo Creeper	Ground cover
145.	X	<i>Lampranthus spectabilis</i>	Trailing Ice Plant	Ground cover
146.	W	<i>Lantana camara cultivars</i>	Yellow Sage	Shrub
147.	W	<i>Lantana montevidensis</i>	Trailing Lantana	Shrub
148.		<i>Lasthenia californica</i>	Dwark Goldfields	Annual
149.	W	<i>Lavandula dentataq</i>	French Lavendar	Shrub
150.	W	<i>Leptospermum laevigatum</i>	Australian Tea Tree	Shrub
151.	W	<i>Leucophyllum frutescens</i>	Texas Ranger	Shrub
152.		<i>Leymus condensatus</i>	Giant Wild Rye	Large grass
153.	N	<i>Ligustrum japonicum</i>	Texas Privet	Shrub
154.	X	<i>Limonium perezii</i>	Sea Lavender	Shrub
155.	W	<i>Liquidambar styraciflua</i>	American Sweet Gum	Tree
156.	W	<i>Liriodendron tulipifera</i>	Tulip Tree	Tree

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157.	X	Lonicera japonica ‘Halliana’	Hall’s Japanese Honeysuckle	Vining Shrub
158.		Lonicera subspicata	Wild Honeysuckle	Vining Shrub
159.	X	Lotus corniculatus	Bird’s Foot Trefoil	Ground Cover
160.		Lotus Heermanii	Woolly Lotus	Perennial
161.		Lotus Scoparius	Deerweed	Shrub
162.	W	Lupinus arizonicus	Desert Lupine	Annual
163.	W	Lupinus benthamil	Spider Lupine	Annual
164.		Lupinus bicolor	Sky Lupine	Flowering annual
165.		Lupinus sparsiflorus	Coulter’s Lupine	Annual
166.	W	Lyonothamnus floribundus ssp. Asplenifolius	Fernleaf Ironwood	Tree
167.	W	Macademia Integrifolia	Macadamia Nut	Tree
168.	W	Mahonia aquifolium ‘Golden Abundance’	Golden Abundance, Oregon Grape	Shrub
169.	W	Mahonia nevinii	Nevin Mahonia	Shrub
170.		Malacothamnus fasciculatus	Chaparral Marrow	Shrub
171.	X	Makephora luteola	Trailing Ice Plant	Ground cover
172.	W	Maytenus boaria	Mayten Tree	Tree
173.	W	Melaleuca nesophila	Pink Melaleuca	Shrub
174.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
175.	*	Mimulus species	Monkeyflower	Flower
176.		Mirabilis californica	Wishbone Bush	Perennial
177.	N	Myoporum debile	Trailing Myoporum	Shrub
178.	N	Myoporum insulare	Boobiella	Shrub
179.	W	Myoporum parvifolium	Creeping Boobiella	Ground cover
180.	W	Myoporum ‘Pacificum’	Trailing Myoporum	Shrub
181.		Nassella [stipa] lepida	Foothill Needlegrass	Ground cover
182.		Nassella stipa] pulchra	Purple Needlegrass	Ground cover
183.		Nemophila menziesii	Baby Blue Eyes	Annual
184.	X	Nerium oleander	Oleander	Shrub
185.		Oenothera hookeri	California Evening Primrose	Flower
186.	W	Oenothera speciosa	Showy Evening Primrose	Perennial
187.	X	Ophiopogon japonicus	Mondo Grass	Ground cover
188.	*	Opuntia littoralis	Prickly Pear	Cactus
189.	*	Opuntia oricola	Oracle Cactus	Cactus
190.	*	Opuntia prolifera	Coast Cholla	Cactus
191.	W	Osmanthus fragrans	Sweet Olive	Shrub
192.	X	Osteospermum fruticosum	Trailing African Daisy	Ground cover
193.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
194.	W	Pelargonium peltatum	Ivy Geranium	Ground cover
195.	X	Penstemon species	Beard Tongue	Shrub

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196.	W	Photinia Fraseri	Red Robin	Shrub
197.	W	Pistacia chinensis	Chinese pistache	Tree
198.	X	Pittosporum undulatum	Victorian Box	Tree
199.		Plantago erecta	California Plantain	Annual
200.	**	Plantago insularis	Woolly Plantain	Annual
201.	X	Plantago sempervirens	Evergreen Plantain	Ground cover
202.	W	Platanus racemosa	California Sycamore	Tree
203.	W	Plumbago auriculata	Plumbago Cape	Shrub
204.		Populus fremontii	Western Cottonwood	Tree
205.	X	Portulacaria afra	Elephant's Foot	Shrub
206.		Potentilla glandulosa	Sticky Cinquefoil	Subshrub
207.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground cover
208.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
209.		Prunus ilicifolia ssp. Ilicifolia	Holly Leaved Cherry	Shrub
210.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
211.	N	Punica granatum	Pomegranate	Shrub/Tree
212.	W	Puya species	Puya	Succulent/shrub
213.	W	Pyracantha species	Firethorn	Shrub
214.		Quercus agrifolia	Coast Live Oak	Shrub
215.	*	Quercus berberdifolia	California Scrub Oak	Shrub
216.	*	Quercus dumosa	Coastal Scrub Oak	Shrub
217.	X	Quercus engelmannii	Engelmann Oak	Tree
218.	X	Quercus suber	Cork Oak	Tree
219.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
220.		Rhamnus californica	California Coffee Berry	Shrub
221.		Rhamnus crocea	Redberry	Shrub
222.		Rhamnus crocea ssp. Ilicifolia	Hollyleaf Redberry	Shrub
223.	N	Rhaphiolepis species	Indian Hawthorn	Shrub
224.		Rhus integrifolia	Lemonade Berry	Shrub
225.	N	Rhus lancea	African Sumac	Tree
226.		Rhus ovataa	Sugarbush	Shrub
227.		Ribes aureum	Golden Currant	Shrub
228.		Ribes indecorum	White Flowering Currant	Shrub
229.		Ribes speciosum	Fuschia Flowering Gooseberry	Shrub
230.	W	Ribes viburnifolium	Evergreen Currant	Shrub
231.	*	Romneya coulteri	Matilija Poppy	Shrub
232.	X	Romneya coulteri 'White Cloud'	White Cloud Matilija Poppy	Shrub
233.	W	Rosmarinus officinalis	Rosemary	Shrub
234.	W	Salvia greggii	Autumn Sage	Shrub

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235.	W	Salvia sonomensis	Creeping Sage	Ground cover
236.		Sambucus mexicana	Mexican Elderberry	Tree
237.	W	Santolina chamaecyparissis	Lavender Cotton	Ground cover
238.	W	Santolina virens	Green Lavender Cotton	Shrub
239.		Satureja chandleri	San Miguel Savory	Perennial
240.		Scirpus acutus	Hard-Stem Bulrush	Perennial
241.		Scirpus californicus	California Bulrush	Perennial
242.	X	Sedum acre	Goldmoss Sedum	Ground cover
243.	X	Sedum album	Green stonecrop	Ground cover
244.	X	Sedum confusum	Stonecrop	Ground cover
245.	X	Sedum x rubrotinctum	Pork & Beans	Ground cover
246.	X	Senecio serpens	Dusty Miller	Ground cover
247.		Sisyrinchium bellum	Blue-Eyed Grass	Ground cover
248.		Solanum douglasii	Douglas Nightshade	Shrub
249.		Solanum xantii	Purple Nightshade	Perennial
250.	W	Stenocarpus sinuatus	Firewheel Tree	Tree
251.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
252.	W	Strelitzia reginae	Bird of Paradise	Perennial
253.		Symphoricarpos mollis	Creeping Snowberry	Shrub
254.	W	Tecoma stans [stenolibium stans]	Yellow Bells	Shrub/small tree
255.	X	Tecomaria capensis	Cape Honeysuckle	Ground cover
256.	N	Teucrium chamaedrys	Germander	Ground cover
257.	N	Thymus serpyllum	Lemon Thyme	Ground cover
258.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
259.		Trichostems lanatum	Wolly Blue-Curls	Shrub
260.	X	Trifolium hirtum ‘Hyron’	Hyron Rose Clover	Ground cover
261.	X	Trifolium fragiferum ‘O’Connor’s’	O’Connor’s Legume	Ground cover
262.		Umbellularia californica	California Laurel	Tree
263.		Verbena Laslostachys	Western Vervain	Perennial
264.	N	Verbena peruviana	Peruvian Verbena	Ground cover
265.	X	Verbena species	Verbena	Ground cover
266.	X	Vinca minor	Dwarf Periwinkle	Ground cover
267.		Vitis Girdiana	Desert Wild Grape	Vine
268.	X	Vulpia myuros ‘Zorro’	Zorro Annual Fescue	Grass
269.	W	Westringia fruticosa	Coast Rosemary	Shrub
270.	W	Xanthorrhoea species	Grass Tree	Perennial / shrub
271.	W	Xylosma congestum	Shiny Xylosma	Shrub
272.	X	Yucca species	Yucca	Shrub
273.		Yucca whipplei	Yucca	Shrub

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