APPENDIX E

Average Daily Visitation by Park Area

APPENDIX E

Modified Redesign Alternative
Average Daily Visitation by Park Area
Calculations

(Sources: ATE, 2010 and MRCA, 2010)

Existing Average Daily Visitation (ADV) By Park Area

Ramirez Canyon Park: ADV provided by MRCA, 2009.

Escondido Canyon Park: ADV derived from 11/20/2006 Crain Traffic Study & 2010 ATE Traffic Study (14 spaces x 1.5 persons/vehicle x 1.8 vehicles/ space/ day).

Latigo Trailhead: ADV provided by MRCA, 2009.

Corral Canyon Park: ADV derived from October 2009 ATE Parking Analysis & 2010 ATE Traffic Study (14 spaces x 1.5 persons/ vehicle x 1.8 vehicles/ space/ day).

Malibu Bluffs: ADV derived from 11/20/2006 Crain Traffic Study & 2010 ATE Traffic Study (0.1 parking space/acre x 79.8 acres x 1.5 persons/vehicle x 1.8 vehicles/ space/ day).

New Additional Average Daily Visitation (ADV) By Park Area

Weighted Average Method (weekday and weekend)

Ramirez Canyon Park:

Non-Event: ADV derived from 2010 ATE Traffic Study [5 (76 weekday ADT / 2 x 1.5 persons/vehicle) + 2 (138 weekend ADT / 2 x 1.5 persons/vehicle)] / 7 days = 70 persons.

Event: Phase 1: Derived from MRCA: [(40-person gatherings 2 times/week) + (15 staff/day) + (200-person special event occurring 6 times per year / 365 days)] = 29 persons.

Phase 2: Derived from MRCA: [(40-person gatherings/day) + (15 staff/day) + (200-person special event occurring 16 times per year / 365 days) + (40-person tours occurring 12 times per month)] = 80 persons.

Escondido Canyon Park:

Non-Event: ADV derived from Existing ADV above and 2010 ATE Traffic Study

[5 (61 weekday ADT / 2 x 1.5 persons/vehicle) + 2 (90 weekend ADT / 2 x 1.5 persons/vehicle)] / 7 days = 52 persons.

Event: Not applicable.

Latigo Trailhead:

Non-Event: ADV derived from 2010 ATE Traffic Study [5 (14 weekday ADT / 2 x 1.5 persons/vehicle) + 2 (21 weekend ADT / 2 x 1.5 persons/vehicle)] / 7 days= 12 persons.

Event: Not applicable.

Corral Canyon Park:

Non-Event: ADV derived from Existing ADV above and 2010 ATE Traffic Study (new) [5 (41 weekday ADT / 2 x 1.5 persons/vehicle) + 2 (45 weekend ADT / 2 x 1.5 persons/vehicle)] / 7days = 32 persons.

Event: Not applicable.

Malibu Bluffs:

Non-Event: ADV derived from Existing ADV above and 2010 ATE Traffic Study (new) [5 (90 weekday ADT / 2 x 1.5 persons/vehicle) + 2 (97 weekend ADT / 2 x 1.5 persons/vehicle)] / 7days = 69 persons.

Event: Not applicable.

Modified Redesign Alternative

Average Daily Visitation by Park Area (includes adjacent trail systems)

Location	Existing Average Daily Visitation	New Add'l Average Daily Visitation	Total Average Daily Visitation	
			BASELINE 1: Recreation/ Administration	***BASELINE 2: Vacant Residential***
Ramirez Canyon Park	Baseline 1: 27 Baseline 2: 0	Phase 1: 99 Phase 2: 150	Phase 1: 126 Phase 2: 177	Phase 1: 99 Phase 2: 150
Escondido Canyon Park	38	0	0	0
Latigo Trailhead	0	12	12	12
Corral Canyon Park	38	32	32	32
Malibu Bluffs	22	65	65	65
Total	**125/98**	**208/259**	**235/286**	**208/259**

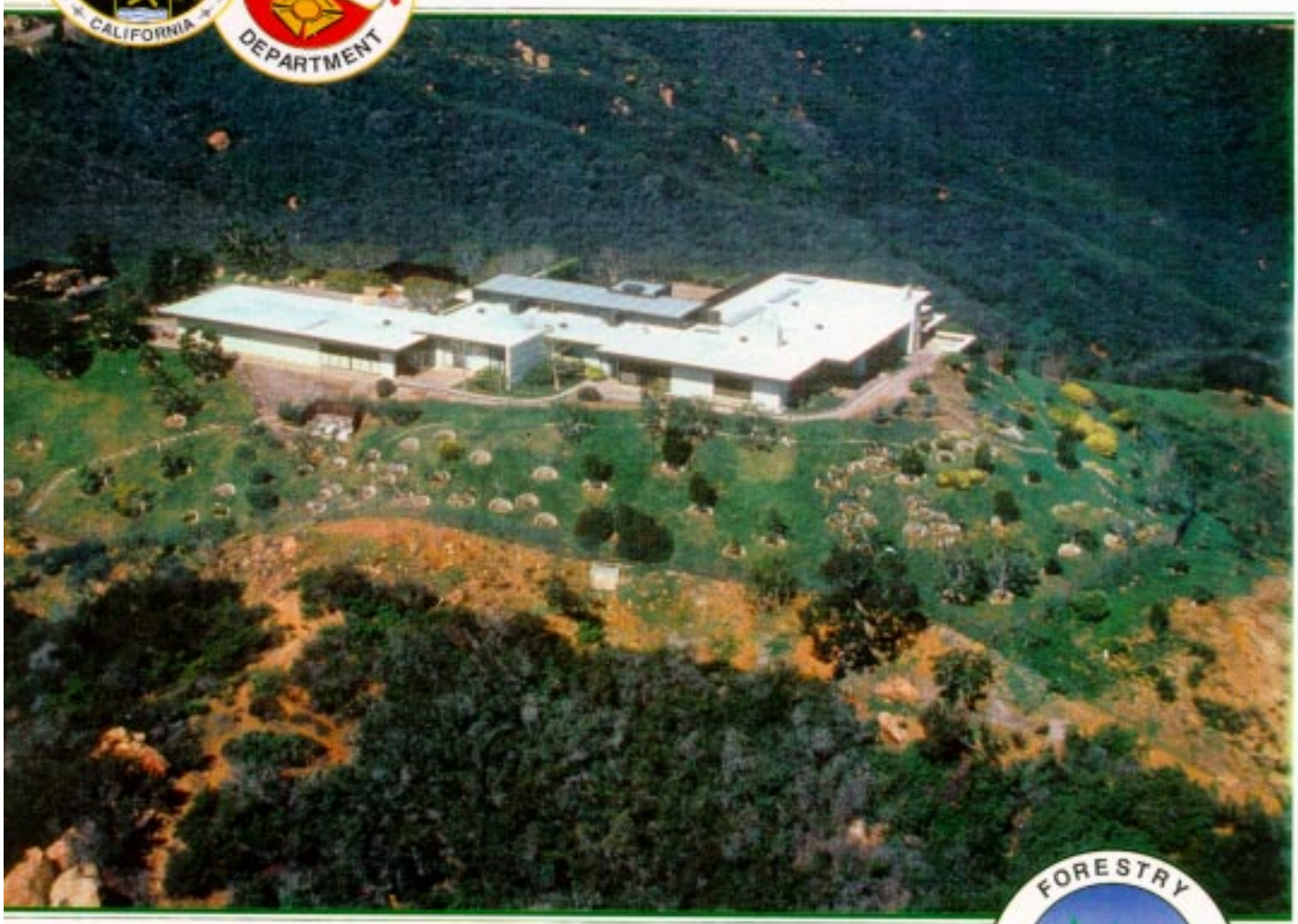
Source: ATE, 2010 and MRCA, 2010.

APPENDIX F

County of Los Angeles Fuel Modification Plan Guidelines and Desired Plant List

Fuel Modification Plan Guidelines

County of Los Angeles
Fire Department



Fuel Modification Unit

Prevention Bureau
Forestry Division

FUEL MODIFICATION PLAN

GUIDELINES

FOR PROJECTS LOCATED IN

FIRE ZONE 4 OR

VERY HIGH FIRE HAZARD

SEVERITY ZONES

ADOPTED

JANUARY 1998

County of Los Angeles Fire Department

Prevention Bureau

Forestry Division

Brush Clearance Section

TABLE OF CONTENTS

Introduction

Following the disastrous Southern California wildfires in 1993, the Board of Supervisors established the Wildfire Safety Panel to analyze and make recommendations on the hazardous conditions that existed for wildfires in the wildland and urban interface/intermix areas of Los Angeles County. The mission identified by the Wildfire Safety Panel at its onset was to enhance life safety concerns in Los Angeles County through the analysis and development of meaningful, cost-effective ways to improve fire safety. One of the recommendations adopted by the Wildfire Safety Panel was for the Fire Department to establish a set of guidelines and landscape criteria for all new construction that would implement ordinances relating to fuel modification planning and help reduce the threat of fires in high hazard areas.

The "Fuel Modification Guidelines" herein are administrative in nature and have been adopted by the County of Los Angeles Fire Department to provide procedural implementation of County Fire Code requirements previously adopted by the Board of Supervisors and already in effect for a Fuel Modification Plan for projects and or structures proposed within the Very High Fire Hazard Severity Zone(s) or Fire Zone 4. The submittal of fuel modification plans that meet the requirements of these guidelines will enable the Fire Department and other agencies to expedite processing and answer applicant's questions. These guidelines require compliance with existing codes and do not modify or change existing Fire Code clearance distances or any other code requirements.

Statute

Per Section 1117.2.1 of the 1996 County Fire Code: "A fuel modification plan, a landscape plan and an irrigation plan shall be submitted with any subdivision of land or prior to any new construction, remodeling, modification or reconstruction of a structure where such remodeling modification or reconstruction of a structure increases the square footage of the existing structure by 50% or more within any 12-month period and where the structure or subdivision is located within areas designated as a Very High Fire Hazard Severity Zone or Fire Zone 4 in the Los Angeles County Building Code (Section 26.150, Los Angeles County Code Title 26 Building Code)."

Fuel modification plans are required for all projects and/or structures receiving tentative map approval or building permits on or after January 7, 1996. Tentative maps approved prior to January 7, 1996 are exempt from these requirements. In addition, any amendment or revisions to such maps which do not require public review would also be exempt.

Description of Fuel Modification Plan

A fuel modification plan identifies specific zones within a property which are subject to fuel modification. A fuel modification zone is a strip of land where combustible native or ornamental vegetation has been modified and/or partially or totally replaced with drought tolerant, fire resistant plants.

Fuel modification plans will vary in complexity and reflect the fire history of the area, the amount and type of vegetation, the arrangement of the fuels, topography, local weather patterns, and construction, design and placement of structures.

Purpose of Fuel Modification

Fuel modification reduces the radiant and convective heat, and provides fire suppression forces a defensible space in which to take action. Fuel modification zones are strategically placed as a buffer to open space, or areas of natural vegetation and generally would occur surrounding the perimeter of a subdivision, commercial development, or isolated development of a single-family dwelling. Modification of combustible vegetation within a development is handled under the "Clearance of Vegetative Growth" section of the Fire Code as it pertains to structures.

Protected Land - Any project located contiguous to protected lands, as defined in Government Code Section 51184, shall be handled on a case-by-case basis as identified within this code section.

Special Constraints - Information regarding physical, environmental, and legal constraints that may compromise the ability to complete the fuel modification requirements of the project should be addressed in the first stages of design and planning, at the time of preliminary review. Alternative solutions to conflicts may include modifications in the zone widths as a result of set backs, structure orientation, building design and materials selection, utilization of streets, parks, golf courses, natural barriers, existing development or increased irrigation zones.

Subdivision Requirements

Current code requirements for subdivisions including access, fire flow, fire sprinklers, water storage and fire resistive construction techniques will be considered and credited, as appropriate, by the Fire Department in establishing the final fuel modification requirements for a project. Alternative fuel modification proposals may be submitted to the Fire Department for review and approval.

Extreme Fire Hazard - If the Fire Department concludes an extreme fire hazard exists on the property, additional mitigation measures may be required. The Fire Department shall review each project on a case-by-case basis to identify the contributing extreme fire hazard conditions including, but not limited to: wind direction and velocity, fuel load, neighboring land uses, terrain, access for firefighting equipment, adequacy of water supply and delivery systems and construction standards. Generally, the Santa Monica Mountains and the south facing slopes of the San Gabriel Mountains are considered to be Extreme Fire Hazard areas.

Submittal Procedures

Fuel modification plans shall be reviewed and approved by the Forestry Division of the Fire Department for reasonable fire safety. Approval of the final fuel modification plan by the Fire Department is required prior to the issuance of a building permit. Property owners located along the perimeter of tracts must submit plans for additional structures for approval by the Fire Department in addition to the building department to ensure compliance with the underlying fuel modification plan (see Exhibit A for a complete checklist of submittal procedures).

Fuel Modification Zones

The size and type of the fuel modification zone(s) will be determined by the Fire Department upon review of the preliminary plans. Fuel modification distances are designed for typical fire weather scenarios and are not intended to be a blanket requirement for all fuel modification plans. Planting of low-volume, fire retardant, drought tolerant plants may also be required for erosion control (see Exhibit B Estimated Fuel Modification Distance Chart to compute the approximate total fuel modification zone distance for your project).

Per Section 1117.2.3 "Extra Hazard" of the County of Los Angeles 1996 Fire Code, "The governing body finds that in many cases of extra-hazardous situations, a firebreak around structures of only 30 feet (9144mm) is not sufficient and that a firebreak of 50 feet (15240mm) or more may be necessary. If the chief or commissioner finds that because of the location of any building or structure, and because of other conditions, a 30-foot (9144 mm) firebreak around such structure as required by Section 1117.2.2 is not sufficient, he may notify all affected owners of property that they must clear all flammable vegetation and other combustible growth or reduce the amount of fuel content for a distance greater that 30 feet (9144 mm), but not to exceed 200 feet (60960mm)." Fire Code distances are measured on the horizontal or straight out from the structure rather than on the slope.

Zone Delineation

The fuel modification plan shall identify one or more of the following zones: A-Setback Zone; B-Irrigated Zone; C-Thinning Zone; D- Interface Thinning Zone based upon preliminary plan review by the Forestry Division of the Fire Department (see Exhibit C). The actual width of zone(s) will depend on the ability to provide desirable clearance distances.

Zone A - Setback Zone

Purpose

- Provides defensible space for fire suppression forces.
- Offers protection from intense flames and sparks or embers carried by strong winds common to a wildfire by reducing the probability of ignition through increased moisture content of existing vegetation and removal of fine fuels.

General Requirements

- Zone in closest proximity to the structure.
- Minimum of 20 feet beyond the edge of combustible structures, attached accessory structures, or appendages and projections.
- For purposes of the fuel modification plan, all combustible accessory structures, appendages, or projections within 20 feet of the combustible structure will be considered as attached.
- Most vegetation in this zone is limited to ground covers, green lawns, and a limited number of selected ornamental plants.

Special Requirements

- Combustible structures, attached accessory structures, appendages or projections must comply with building code requirements for the Very High Fire Hazard Severity Zone or Fire Zone 4.
- Combustible detached accessory structures such as patio covers, decks, carports, trellises, or similar accessory structures within 20 feet of a combustible structure must comply with building code requirements for the Very High Fire Hazard Severity Zone or Fire Zone 4.
- Irrigation by automatic or manual sprinkler systems to maintain healthy vegetation with high moisture content.
- Irrigation away from native Oak trees and outside the dripline.
- Pruning of foliage to reduce fuel load, vertical continuity, removal of plant litter and dead wood.
- Complete removal of undesirable plant species (see Appendix I), minimal allowance for retention of selective native vegetation.
- Plants in this zone shall be highly fire resistant and selected from the approved planting list for the setback zone and given geographical area (see Appendix II).
- Target trees are not allowed within ten feet of combustible structures. Other tree species may be allowed pursuant to the Fire Code regarding clearance of brush and vegetative growth but are not recommended.
- Special consideration will be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions.

Maintenance

- Requires continual removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operational integrity and programming of the irrigation system.
- Regular trimming to prevent ladder fuels.

Zone B Irrigation Zone

Purpose

- Provide defensible space for fire suppression forces.
- Augment irrigation and planting required by the County Department of Public Works and City Public Works Departments relating to remanufactured slopes and landscape ordinances.

General Requirements

- May have isolated detached accessory structures such as patio covers, decks, carports, trellises, and other similar accessory structures provided they meet building code requirements.
- Some native or existing vegetation may remain if spaced according to planting guidelines (see Appendix III) and maintained free of dead wood, and individual plants are thinned to a percentage as specified during the preliminary review to reduce the fuel load.
- A large percentage of existing vegetation may be removed and replaced with appropriate irrigated fire resistant and drought tolerant plant material.

Specific Requirements

- With the exception of specimen native vegetation approved for retention, irrigated surface fuels shall be maintained at a height not to exceed 18 inches.
- Irrigation shall be designed to supplement native vegetation, and establish and maintain planted natives and ornamentals.
- Any plants selected for planting in this zone shall be selected from the approved plant list for the setback, irrigated, or thinning zone for a given geographical area (see appendix II).
- Planting will be in accordance with planting guidelines and spacing standards established in these guidelines to avoid erosion (see Appendix III).
- Special consideration will be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions as identified in the environmental documents submitted for project approval, or upon further review.
- Removal of undesirable plant species (see Appendix I) as determined during preliminary review.

Maintenance

- Requires continual removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operational integrity and programming of the irrigation system.
- Regular trimming to prevent ladder fuels.

- Compliance with the Fire Code is a year round responsibility. Enforcement will occur following inspection by the Fire Department annually or as needed. Annual inspections are generally conducted following natural drying of fine fuels. This occurs between the months of April and June.

Zone C Thinning Zone

Purpose

- Designed to slow the rate of spread, reduce flame lengths, and intensities of the fire prior to reaching the irrigated area.
- Designed to eliminate the spread of fire from one plant to another via ladder fuels and eliminate horizontal continuity by properly spacing remaining vegetation and limiting large masses of unbroken vegetation.
- Reduce the fuel load of a wildland area adjacent to a structure, thereby, reducing the radiant and convective heat of wildland fires.

General Requirements

- Predominantly existing vegetation with removal of the majority of undesirable plant species including trees and tree-form shrubs (see Appendix I).
- Reduce fuel loading by reducing the fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of soil holding root systems.
- Some replacement planting with ornamental or less flammable native species to meet minimum slope coverage requirements of city or county public works, landscape or hillside ordinances.
- Natural vegetation is thinned by reduced amounts as the zone moves away from the development.

Specific Requirements

- Removal of all dead and dying vegetation, all fine fuels reduced to 3 inches in height.
- Any plants selected for planting in this zone will be chosen from the approved plant list for the setback, irrigated, or thinning zone for a given geographical area (see Appendix II).
- Special consideration will be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions as identified in the environmental documents submitted for project approval review.

Maintenance

- Requires annual removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operational integrity and programming of the irrigation system.
- Compliance with the Fire Code is a year round responsibility. Enforcement will occur following inspection by the Fire Department annually or as needed. Annual inspections are generally conducted following natural drying of fine fuels. This occurs between the months of April and June.
- Debris and trimmings produced by thinning and pruning shall be removed from the site or chipped and evenly dispersed in the same area to a maximum depth of 5 inches.

Zone D Interface Thinning Zone

Purpose

- Designed to slow the rate of spread, reduce flame lengths, and intensities of the fire prior to reaching the irrigated area.
- Designed to eliminate the spread of fire from one plant to another via ladder fuels and eliminate horizontal continuity by properly spacing remaining vegetation and limiting large masses of unbroken vegetation.
- Reduce the fuel load of a wildland area adjacent to a structure, thereby, reducing the radiant and convective heat of wildland fires.

General Requirements

- Area serving as the initial interface between wildland areas and fuel modification zones.
- Consists of native vegetation individually thinned to reduce foliage mass or fuel loading. This does not necessarily require removing plants, but thinning those that exist.
- Proper thinning and spacing of remaining trees and tree-form native shrubs, reducing fuel load without overly exposing the soil to the threat of erosion.
- Natural vegetation is thinned by reduced amounts as the zone moves away from the development.

Specific Requirements

- Maintain sufficient cover to prevent erosion without requiring planting.
- Special consideration will be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions as identified in the environmental documents submitted for project approval.

- Any plants selected for planting in this zone shall be chosen from the approved plant list for the setback, irrigated, or thinning zone for a given geographical area (see Appendix II).
- Special consideration will be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions as identified in the environmental documents submitted for project approval review.

Maintenance

- Correct maintenance of this zone requires removal of overgrowth and major pruning every three to five years.
- Debris and trimmings produced by thinning and pruning shall be removed from the site or chipped and evenly dispersed in the same area to a maximum depth of 5 inches.
- Compliance with the Fire Code is a year round responsibility. Enforcement will occur following inspection by the Fire Department annually or as needed. Annual inspections are generally conducted following natural drying of fine fuels. This occurs between the months of April and June.

Off-Site Fuel Modification Option

Off-site fuel modification is generally not recommended due to problems inherent with enforcement of regulations on adjacent property and the potential for confusion regarding responsibility for fuel modification areas outside legal ownership. However, if the applicant should voluntarily request and obtain permission from neighboring property owners for fuel modification, it shall be taken into consideration by the Fire Department as part of the project's fuel modification plan.

The intent of these guidelines is to provide for fuel modification within the proposed project's or structure's property boundaries. If the fuel modification zones, consistent with these guidelines, cannot be fully contained on the subject property, on-site alternative means and methods should be sought to provide an equal level of protection from wildland fire. Alternative means and methods may include, but are not limited to, the following: 1) increasing the width of the setback or irrigated zones to reduce thinning zone dimensions, 2) enhancing fire protection construction techniques, 3) structure orientation, and 4) construction of non-combustible fencing material.

Compliance

Construction Phase - Plan review and approval is required for issuance of a building permit(s). Implementation of the fuel modification plan (other than that which will be assigned to the home buyer) is required prior to the issuance of Certificate of Occupancy or building final.

Long-Term Maintenance/Enforcement - The builder/developer is responsible for providing new property owners with recorded CC&R's or disclosure statements identifying the responsibilities for maintaining the fuel modification zone(s) within their property as defined in the approved Fuel Modification Plan. Approved Fuel Modification Plans will be reviewed annually as part of the brush clearance inspection process, by local fire station personnel, brush clearance office personnel, fire prevention or forestry personnel.

EXHIBIT A
CHECKLIST FOR PRELIMINARY REVIEW TO DETERMINE REQUIRED FUEL MODIFICATION ZONES

A preliminary review of your project will determine the site specific requirements necessary to assure reasonable fire safety. All required documents for a preliminary review shall be submitted to the Fuel Modification Unit of the County of Los Angeles Fire Department at the time of tentative map processing. The Preliminary Fuel Modification Plan review will be required prior to final map approval. Approved revisions to the fuel modification plans will be allowed up to the point of issuance of building permit. For information regarding fuel modification plans, please contact the Fuel Modification Unit of the Forestry Division at (909) 620-8287 or (213) 881-2481.

Tentative Map

1. The applicant shall submit three (3) sets of site plans indicating building envelopes to the Fire Department during the tentative map approval process. Additional copies may be submitted for stamp approval as the applicant deems necessary to meet the requirements of other agencies.
2. Indicate on an additional topographic map: project location, legal description, and tentative map.
3. Indicate existing land uses contiguous in all directions up to two hundred (200) feet outside of the project boundaries (i.e., construction, natural vegetation, roads, parks, etc.)
4. Provide photographs and a photo orientation map, of the area which show the type, size, and density of existing vegetation.
5. Indicate who will be responsible for the long-term maintenance of the fuel modification zones (property owner, adjacent property owner, landscape maintenance district, Homeowner's Association, etc.)
6. Submit copies of environmental documents which may disclose conflict with fuel modification plan requirements (i.e., endangered species habitat mitigation, Oak tree preservation, etc.)
7. After review by the Fire Department of all documents provided by the applicant, the Fire Department will meet with the applicant to discuss the recommended fuel modification requirements for the project and finalize the approval of the preliminary fuel modification plan.

NOTE: Documents prepared specifically to meet requirements of other agencies may be submitted, provided the necessary information is included. Approval of a fuel modification plan by the County of Los Angeles Fire Department does not eliminate the requirement or the responsibility of the applicant to obtain appropriate environmental, grading, building, and zoning clearances or permits from the agencies having jurisdiction.

CHECKLIST FOR FINAL FUEL MODIFICATION PLAN

Building Permit

1. Prior to the issuance of a building permit the applicant will submit three (3) sets of blue line plans to the Fire Department showing the final fuel modification requirements. Additional copies may be submitted for stamp approval as the applicant deems necessary to meet the requirements of other agencies. The plan package shall include the following:

    a. Irrigation Plan - The irrigation plan should indicate the areas to be irrigated and the type of irrigation system to be installed.

    b. Landscape Plan - The landscape plan should identify the location and type of all supplemental plantings and location type, and the size of plants remaining on site following modification. The plan should include a complete list of all plants identified by common and scientific name. The landscape plan should also include any specific maintenance intended for the site such as special pruning, mowing, etc.

    c. Zone Delineation - Zone delineation and fuel modification actions planned and completed may be indicated on the landscape plan or a separate plan.

    d. Identification of Responsibility - A letter identifying parties responsible for installation and/or maintenance such as homeowners, homeowner associations, or land management districts.

2. Prior to the issuance of a building permit, the Fire Department must review and approve the final fuel modification plan package submitted by the applicant. Applicants should expect review within 10 working days of the department's receipt of a complete package.

Certificate of Occupancy/Building Final

1. Final approval of fuel modification zone implementation will be obtained following inspection by the fire department. Applicants shall request inspection of the fuel modification requirements by the Fire Department three business days prior to anticipated issuance of a certificate of occupancy or building final. The Fire Department shall respond to an inspection request within three business days.

2. A copy of the recorded CC&R's pertaining to fuel modification maintenance requirements and responsibilities will be provided to the Forestry Division prior to issuance of Certificate of Occupancy.

NOTE: The review and approval process outlined in these guidelines is designed to assist an applicant through the fuel modification process. If questions or conflicts arise, applicants should request assistance from the Fire Department's Brush Clearance Section Manager. If additional clarification is necessary or special circumstances arise, applicants may seek assistance or policy interpretation from the Chief of the Forestry Division.

EXHIBIT B

ESTIMATED FUEL MODIFICATION DISTANCE CHART (EFMD)

STRUCTURE CONSTRUCTION			SCORE
GOOD/CURRENT FIRE ZONE 4 OR VHFHSZ REQUIREMENTS		1	
MODERATE		5	
POOR		10	
FUELS			
PRIMARILY GRASSLAND		5	
COASTAL SAGE SCRUB/OAK WOODLAND		10	
CHAPARRAL		15	
SLOPE*	**DOWN-SLOPE**	**UP-SLOPE**	
		0 - 20 DEGREES	1
	0 - 20 DEGREES	20 - 40 DEGREES	2
	20 - 40 DEGREES	40 - 60 DEGREES	4
	40 - 60 DEGREES	60 < DEGREES	8
	60 < DEGREES		16
ASPECT**			
NORTH		1	
EAST		2	
WEST		4	
SOUTH		8	
FIRE TOPOGRAPHY***			
- DISTANCE FROM SLOPE,CHIMNEYS,SADDLES,CANYONS			
250 - 300		1	
200 - 250		2	
150 - 200		3	
100 - 150		4	
50 - 100		5	
30 - 50		10	
< 30		15	
FIRE HISTORY/ POTENTIAL			
- HISTORICAL FIRE PATTERNS/INTENSITY			
LOW		5	
MODERATE		10	
HIGH		15	
		TOTAL	

ESTIMATED FUEL MODIFICATION DISTANCE****		EFMD
TOTAL	**DISTANCE**	
14-24	50'	
25-34	100'	
35-49	150'	
50-69	200'	
70 +	300'	

* SELECT CATAGORY THAT CORRESSPONDS TO THE LOCATION OF THE REQUIRED MODIFICATION

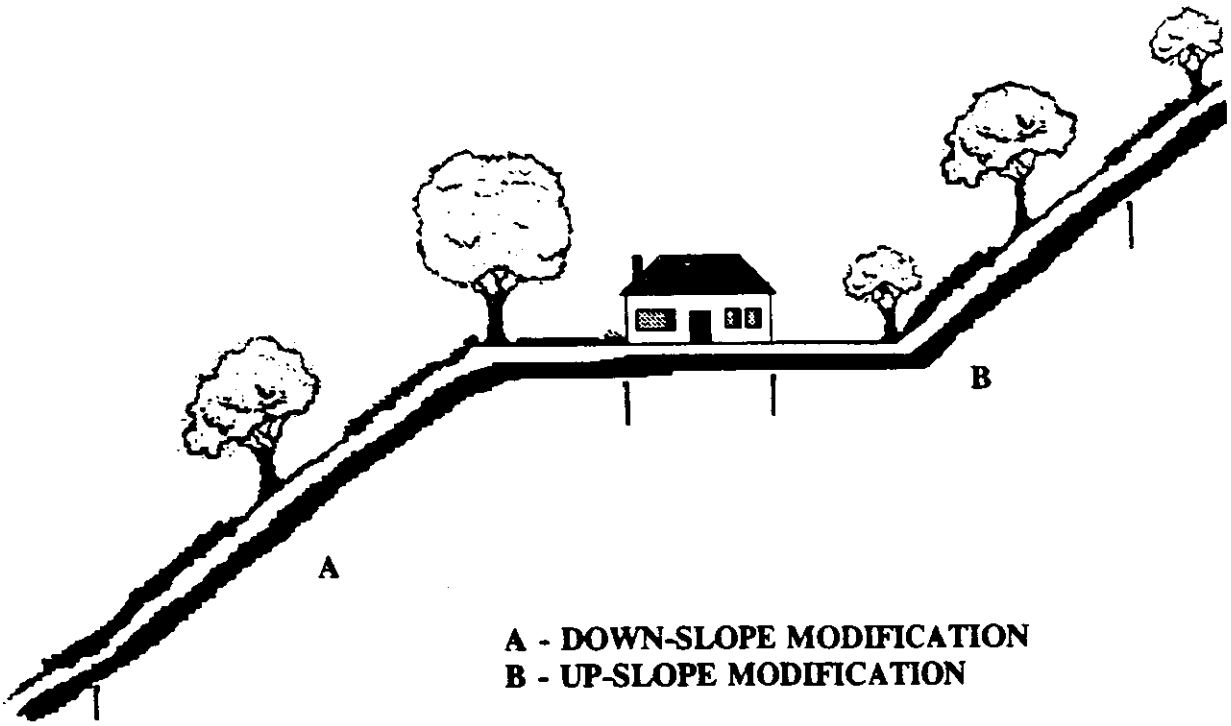
** VALUES ASSIGNED MAY VARY, BASED ON PREVAILING WEATHER PATTERN AND FIRE HISTORY

*** SUBDIVISIONS SHOULD ENTER A VALUE OF (5) FOR THIS CATAGORY

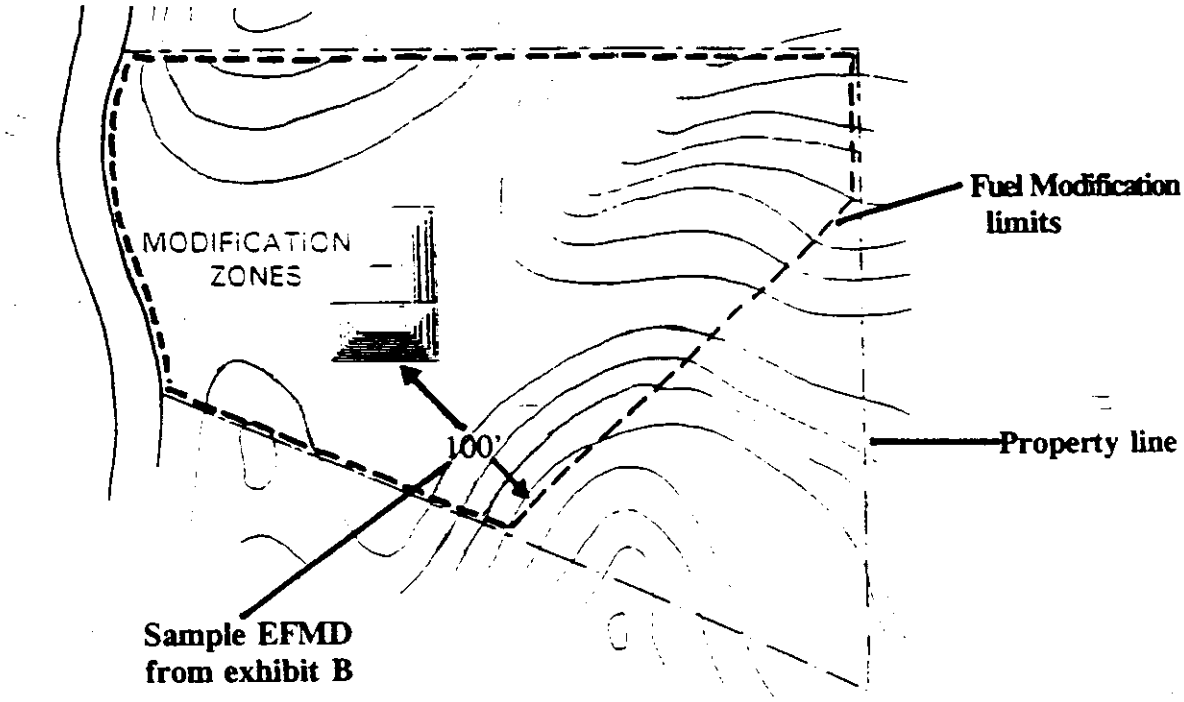
**** MEASUREMENT IN FEET TAKEN ALONG SLOPE (HYPOTENUSE)

EXHIBIT C

SAMPLE FUEL MODIFICATION DIAGRAMS



A - DOWN-SLOPE MODIFICATION
B - UP-SLOPE MODIFICATION



The actual amount of total fuel modification will be determined on a case by case basis utilizing Exhibit B, Estimated Fuel Modification Distance(EFMD). The necessary zone(s) and their width will be determined during the preliminary review process.

APPENDIX I
UNDESIRABLE PLANT LIST

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 flamability 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 should not be planted in fire hazard areas. Should these species already exist within these areas, they should be removed because of the potential threat they pose to any structures. They are referred to as target species since their complete or partial removal is a critical part of hazard reduction. The following is a partial list of plants that should be avoided near structures.

UNDESIRABLE PLANT SPECIES (TARGET SPECIES)

Natives:
Adenostoma fasciculatum - Chamise
Adenostoma sparsifolium - Red shank
Artemisia californica - California Sagebrush
Eriogonum faciculatum - Common Buckwheat
Salvia spp.- Sage

Ornamentals:
Cortaderia spp. - Pampas Grass
Cupressus spp. - Cypress
Eucalyptus spp. - Eucalyptus*
Juniperus spp. - Juniper
Pinus spp. - Pine

* Except as permitted in the planting list

Others - Other plants may be considered to be undesirable because of their ability to naturalize and become a pest. These types of plants should be avoided, especially in sensitive riparian or coastal areas where they could become established and compete with native vegetation.

Plants should fit the location and situation. Avoid using shallow rooted ground covers on steep slopes. Iceplant, while an effective ground cover on flat surfaces would be undesirable on a steep slope because it's shallow rooted nature may cause it to slide off the slope if the root zone becomes saturated during a rain storm. This would expose the bare soil to erosion.

Care should be taken to avoid erosion problems created or exacerbated by total vegetation removal. In areas where target species comprise the total vegetation, partial removal is recommended, with replacement planting using desirable species as the long range goal.

APPENDIX II
DESIRABLE PLANT LIST

Desirable Qualities for Landscape Plants

- Ability to store water in leaves or stems.
- Produces limited dead and fine material.
- Extensive root systems for controlling erosion.
- High levels of salt or other compounds within its tissues that can contribute to fire resistance.
- Ability to withstand drought.
- Prostrate or prone in form.
- Ability to withstand severe pruning.
- Low levels of volatile oils or resins.
- Ability to resprout after a fire.

PLANT LIST LEGEND

Fuel Mod. Zone	Geographical Area	Water Needs	Evergreen/Deciduous
A - Setback	C-Coastal	H-High	E-Evergreen
B - Irrigated	IV-Interior Valley	M-Moderate	D-Deciduous
C - Thinning	D-Deserts	L-Low	E/D-Partly or
D - Interface		VL-Very Low	Summer Deciduous

Comment Code

1	Not for use in coastal areas	13	Tends to be short lived.
2	Should not be used on steep slopes	14	High fire resistance.
3	May be damaged by frost.	15	Dead fronds or leaves need to be removed to maintain fire safety.
4	Should be thinned bi-annually to remove dead or unwanted growth	16	Tolerant of heavy pruning.
5	Good for erosion control.	17	Must be cut back after flowering.
6	Grows best in well drained soils.	18	May require partial shade in desert or valley areas.
7	Produces flowers or fruit that attracts birds and or butterflies.	19	Perennial
8	Adaptability can vary.	20	Tolerates saline soils.
9	Can be used as a lawn substitute.	21	Grows naturally in riparian areas.
10	Showy flowers.	22	Good tree for lawns.
11	Produces edible fruit.	23	Produces habitat or food for wildlife.
12	California native or native cultivar		

The following plant list is provided as a suggested guideline (not exclusive) for fuel modification landscapes within Los Angeles County. Plants not listed (grasses, annuals etc.) may be used if approved with the fuel modification plan.

The desirable planting list is based on comments from numerous professionals and public agencies, Sunset Western Garden Book, Bob Perry's Landscape Plants for Western Regions, and the California Department of Water Resources study entitled, WUCOLS (Water Use Classification of Landscape Species). The plant list is arranged by fuel modification zone, geographical area, and plant type and includes a comment code to assist in plant selection and maintenance requirements.

GROUNDCOVERS

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Abelia grandiflora 'Prostrata'	Prostrate Glossy Abelia	A,B	M	1 - 2'	3 - 4'	E	C,IV - 3
Achillea tomentosa	Woolly Yarrow	A,B,C	L	6 - 10"	6 - 12"	E	C,IV - 9,19
Aeonium species	NCN	A,B,C	L	Varies	Varies	E	C,IV - 2,3,8,14
Ajuga reptans	Carpet Bugle	A	H	4 - 6"	2 - 4"	E	C,IV - 2,18,19
Aptenia cordifolia	Red Apple Ice Plant	A,B	M,L	- 12"	varies	E	IV,D - 1,2,3,19
Arctostaphylos species	Manzanita	B,C,D	L,VL	Varies	Varies	E	Varies
A. edmundsii	Little Sur Manzanita	B,C,D	L,VL	1 - 2'	4 - 6'	E	C,IV - 4,6,12
A. 'Emerald Carpet'	Emerald Carpet Manzanita	B,C,D	L,VL	1'	4 - 6'	E	C,IV - 4,6,12
Arctotheca calendula	Cape Weed	A,B	M,L	-12"	-18"	E	C,IV,D - 3,7,10,19
Artemisia californica 'cultivars'	Sagebrush - Prostrate Forms	B,C,D	L,VL	varies	varies	E	C,IV,D - 4,6,8,12,23
A. caucasica	Silver Spreader	B,C,D	L,VL	3-6"	2'	E	C,IV,D - 4,6
Asarum caudatum	Wild Ginger	A	M,H	7-10"	2'	D	C,IV - 3,18,19
Atriplex semibaccata	Creeping Saltbrush	B	L,VL	1'	1-5'	E	C,IV,D - 13,20
Baccharis pilularis							
B.p. 'Pigeon Point'	Dwarf Coyote Brush	B,C,D	L,VL	12-24"	-6'	E	C,IV,D - 4,5,12
B.p. 'Twin Peaks'	Dwarf Coyote Brush	B,C,D	L,VL	12-24"	-6'	E	C,IV,D - 4,5,12
Cerastium tomentosum	Snow-in-Summer	A,B	M,L	6-8"	2-3'	E	C,IV,D - 10,19
Chamaemelum nobile	Chamomile	A,B	M	6-8"	-12"	E	C,IV,D - 9,16,19
Cistus salviifolius	Sageleaf Rockrose	B,C	L,VL	1-2'	6'	E	C,IV,D-4,5,6,7,10,16,20
C. 'Sunset'	Rockrose	B,C	L,VL	1-2'	6-8'	E	C,IV,D-4,5,6,7,10,16,20
C. 'Warley rose'	Rockrose	B,C	L,VL	1'	4'	E	C,IV,D-4,5,6,7,10,16,20
Coprosma kirkii	NCN	B	M,L	-2'	6-8'	E	C,IV - 3,4,5,8,18,20
Coreopsis auriculata 'Nana'	NCN	A,B,C	L,VL	5-8"	-2'	E/D	C,IV - 3,8,19
Cotoneaster							
C. adpressus praecox	Cotoneaster	B	M,L	-18"	-6'	D	C,IV,D - 2
C. salicifolius 'Emerald Carpet'	Prostrate Willowleaf Contoneaster	B	M,L	12-15"	-8'	E	C,IV,D - 4
C.s. 'Repens'	Prostrate Willowleaf Contoneaster	B	M,L	-6"	-6'	E	C,IV,D - 4
Dalea greggii	Trailing Indigo Bush	B	L,VL	12-18"	5-10'	E	C,IV - 6
Dichondra micrantha	Dichondra	A,B	H,M	-6"	-2'	E	C,IV - 9
Duchesnea indica	Indian Mock Strawberry	A,B	L	-8"	-4'	E	C,IV,D - 11,16,19
Dymondia margaretae	NCN	A,B	M,L	-3"	12-24"	E	C,IV - 3,8
Epilobium californica	California Fuchsia	B,C,D	L,VL	1-2'	3-5'	E/D	C,IV,D-4,5,7,10,12,13,23
Erigeron glaucus	Seaside Daisy	A,B,C,D	M,L	10-12"	-2'	E	C,IV-3,6,8,10,12,18,19,20
E. karvinskianus	Mexican Daisy	A,B,C,D	M,L	10-20"	-3'	E	C,IV-3,6,8,10,18,19,20
Euonymus fortunei 'Colorata'	Purple-Leaf Winter Creeper	B	M	1-2'	-6'	E	IV - 1,5,8,16
Festuca cinerea(ovina'Glauca')	Blue Fescue	A,B	M,L	-12"	-2'	E	C,IV,D - 4
F. rubra	Red Fescue	A,B	M,L	-16"	-30"	E	C,IV,D - 4,9
Fragaria chiloensis	Wild Strawberrry	A,B,C,D	L,VL	6-12"	-24"	E	C,IV,D - 4,10,11,12,20
Gazania rigens var leucolaena	Trailing Gazania	A,B	L	6-10"	-24"	E	C,IV,D - 10,19
Glechoma hederacea	Ground Ivy	A	M	3-6"	-18"	E/D	C,IV,D - 8,19
Hedera helix & varieties	English Ivy	A,B	M,L	6-18"	-4'	E	IV,D - 1,4,5,16
Helianthemum nummularium	Sunrose	B	L	6-8"	-3'	E	C,IV,D - 6,10
Herniaria glabra	Green Carpet	A	M	2-3"	-16"	E	C,IV,D - 8
Hypericum calycinum	Aaron's Beard	B	M,L	6-12"	-3'	E	C,IV,D - 4,5,7,16
H. coris	NCN	B	M,L	6-12"	-2'	E	C,IV,D - 4,5,7,16
Iberis sempervirens	Evergreen Candytuft	A,B	M	6-12"	-6-12"	E	C,IV,D - 10,19
Iva hayesiana	Poverty Weed	B,C,D	L,VL	2-3'	4-5'	E	C,IV,D - 4,5,12,16,23
Laurentia fluviatilis	Blue Star Creeper	A	M	2-4"	6-12"	E	C,IV - 8,19
Lonicera japonica	Japanese Honeysuckle	B	M	1-2'	6-10'	E	IV - 1,5,7,10,16
Lysimachia nummularia	Moneywort	A	H,M	2-6"	-2'	E	C,IV - 18,19

GROUNDCOVERS cont'd

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Mahonia aquifolium'Compacta'	Compact Oregon Grape	A,B	M,L	1-2'	2-3'	E	C,IV - 4,7,12,18,23
M. repens	Creeping Mahonia	A,B	M,L	2-3'	2-3'	E	C,IV - 4,7,12,18,23
Myoporum 'Pacificum'	Pacific Myoporum	B	M,L	2-3'	-30'	E	IV - 1,4,5,16
M. parvifolium	NCN	B	M,L	4-6"	9'	E	IV - 1,4
Nandina domestica							
'Harbour Dwarf'	Dwarf Heavenly Bamboo	A,B	M,L	1 1/2 -2'	2-3'	E	C,IV,D - 15
Oenothera berlandieri	Mexican Evening Primrose	B,C,D	L,VL	10-12"	4'	E	IV,D - 1,4,7,10,17,19
O. stubbei	Baja Evening Primrose	A,B,C,D	L,VL	5"	2'	E	IV,D - 7,19
Ophiopogon japonicus	Mondo Grass	A	M	8-12"	12-24"	E	C,IV - 18
Osteospermum fruticosum	Trailing African Daisy	A,B	M	-18"	-4'	E	IV - 1,10,19
Pelargonium peltatum	Ivy Geranium	A,B	M	-2'	-4'	E	IV - 1,3,7,10,19
P. tomentosum	Peppermint-Scented Geranium	A,B	M	-18"	2-4'	E	IV - 1,3,7,10,19
Phyla nodiflora (Lippia repens)	Lippia	A,B	M,L	2-15"	-3'	E/D	C,IV,D - 9,16,19
Polygonum capitatum	Pink Clover	A,B	M,L	-18"	-2'	E	IV,D - 1,10,19
Potentilla tabernaemontanii	Spring Cinquefoil	A,B	M,L	2-6"	-12"	E	C,IV,D - 9,10,19
Ribes viburnifolium	Catalina Perfume	A,B,C,D	L,VL	-3'	-3'	E	C,IV - 12,18,23
Rosmarinus officinalis							
R.o. 'Huntington Blue'	NCN	B	L	-18"	-4'	E	C,IV,D - 4,5,16
R.o. 'Prostratus'	Prostrate Rosemary	B	L	-24"	-6'	E	C,IV,D - 4,5,16
Salvia sonomensis	Creeping Sage	B,C,D	L	8-12"	3-4'	E	C,IV - 6,12,13,23
Santolina chamaecyparissus	Lavender Cotton	A,B	L	-24"	-3'	E	C,IV,D - 10
S. rosmarinifolius (virens)	Green Lavender Cotton	A,B	L	-24"	-3'	E	C,IV,D - 10
Sedum species	Stonecrops	A,B	L,VL	Varies	Varies	E	C,IV - 2,8,14
Senecio mandraliscae	NCN	A,B	M,L	-18"	-5'	E	C,IV - 3,14,19
S. serpens	Blue Chalkstics	A,B	M,L	-12"	-3'	E	C,IV - 3,14,19
Scaevola 'Mauve Clusters'	NCN	A,B	M,L	4-6"	3-4'	E	C,IV - 6,18,19
Soleirolia soleirolii	Baby's Tears	A	H,M	3-6"	-18"	E	C,IV - 3,18,19
Teucrium chamaedrys							
'Prostratum'	Prostrate Germander	A,B	M,L	4-6"	-3'	E	C,IV,D - 4,16
T. cossonii	NCN	A,B	L	4-6"	-2'	E	C,IV - 6,10
Thymus praecox arcticus	Mother of Thyme	A,B	M,L	2-6"	-18"	E	C,IV,D - 8
T. pseudolanuginosus	Woolly Thyme	A,B	M,L	2-3"	-12"	E	C,IV,D - 8
Trachelospermum							
jasminoides	Star Jasmine	B	M,L	-2'	4-5'	E	C,IV,D - 5,7,10,16
Trifolium fragiferum							
Var. O'connor's	O'Connor's Legume	B	M,L	6-15"	-6'	E	C,IV,D - 5,9,16,19
Verbena hybrida	Garden Verbena	A,B	L,VL	6-12"	1 1/2-3'	E	C,IV,D - 3,7,10,13
V. peruviana	NCN	A,B,C	L,VL	-8"	-2'	E	C,IV,D - 7, 10
V. pulchella gracilior	Moss Verbena	A,B	L,VL	12-15"	2-3'	E	C,IV,D - 8,10,19
V. tenuisecta	Moss Verbena	A,B	L,VL	12-15"	2-3'	E	C,IV,D - 8,10,19
Wedelia trilobata	Wedelia	B	M,L	-12"	4-6'	E	C,IV,D - 3,16, 20
Zoysia tenuifolia	Korean Grass	A	M,L	-6"	-18"	E	C,IV,D - 9

SHRUBS

PERENNIALS/SUCCULENTS

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Acanthus mollis	Bear's Breech	A,D	H,M	-4'	4-6'	E/D	C,IV,D - 3,8,14,16,17,18,19
Achillea filipendulina	Fernleaf Yarrow	B,C	L,VL	4-5'	2'	E	C,IV,D - 10,16,17,19
A. millefolium	Common Yarrow	A,B,C	L,VL	-3'	2'	E	C,IV,D - 10,16,17,19
Aeonium species	NCN	A,B	L	varies	varies	E	C,IV - 3,8,14
Agaranthus species	Lily-Of-The-Nile	A,B	M	varies	varies	E/D	C,IV - 3,4,7,10,14,19
Agave species	Agave	VL,L	L,VL	varies	varies	E	C,IV,D - 3,10,14,17
Aloe species	Aloe	A,B	L,VL	varies	varies	E	C,IV, - 3,7,8,14
Anigozanthos flavidus	Kangaroo Paw	A,B	M,L	3-5'	3'	E	C,IV - 3,6,7,10,19
A. manqlesii	NCN	A,B	M,L	3'	-3'	E	C,IV - 3,6,7,19
Arbutus unedo 'Compacta'	Dwarf Strawberry Tree	B	M,L	6-8'	-8'	E	C,IV,D - 5,7,11,18,23
A.u. 'Elfin King'	NCN	B	M,L	3-5'	-6'	E	C,IV,D - 5,7,11,18,23
A.u. 'Octoberfest'	NCN	B	M,L	6-8'	-8'	E	C,IV,D - 5,7,11,18,23
Arctostaphylos species	Manzanita	B,C,D	L,VL	varies	varies	E	C,IV,D - 4,6,7,10,12
Artemisia 'Powis Castle'	NCN	B,C	L,VL	-3'	6'	E	C,IV - 4,6,12,23
A. stellerana	Beach Worm Wood	B,C	L,VL	-3'	-3'	E	C,IV - 4,6,12,19,23
Aspidistra elatior	Cast-Iron Plant	A,B	M,L	-30"	-3'	E	C,IV - 3,18,19
Baccharis species		B,C,D	L,VL	varies	varies	E	C,IV,D - 4,5,6,12,21,23
Begonia species	Begonia	A,B	H,M	varies	varies	E	C,IV - 3,8,10,14,18
Berberis thunbergii	Japanese Barberry	B	M,L	4-6'	4-6'	D	C,IV,D - 4
B. thunbergii 'cultivars'		A,B	M,L	varies	varies	D	C,IV,D - 4
Bergenia crassifolia	Winter Blooming Bergenia	A,B	M,L	-20"	-20"	E	C,IV - 3,18,19
Buddleia davidii	Butterfly Bush	B	M,L	-10'	-12'	E/D	C,IV,D - 7,10,16,17
Buxus microphylla japonica	Japanese Boxwood	B	M,L	4-6'	4-6'	E	C,IV,D - 16
B.m. koreana	Korean Boxwood	B	M,L	4-6'	4-6'	E	C,IV,D - 16
Caesalpinia gilliesii	Bird of Paradise Bush	B	L,VL	-10'	-10'	E/D	C,IV,D - 7,10
C. mexicana	Mexican Bird of Paradise	B	L,VL	10-12'	-15'	E/D	C,IV,D - 7,10
C. pulcherrima	Red Bird of Paradise	B	L,VL	-10'	-10	E/D	C,IV,D - 7,10
Calliandra californica	Baja Fairy Duster	B,C,D	L,VL	-3'	4-5'	E/D	C,IV,D - 4,6,7,10
C. eriophylla	Fairy Duster	B,C,D	L,VL	-3'	4-5'	E/D	C,IV,D - 4,6,7,10,12
Callistemon citrinus'compacta'	Bottlebrush	B	L,VL	-5'	-5'	E	C,IV,D - 5,7,10,20
Calycanthus occidentalis	Spice Bush	B,C,D	M,L	4-12'	-5'	D	C,IV - 12,18
Carissa macrocarpa							
(grandiflora &'cultivars')	Natal Plum	A,B	M,L	-7'	-7'	E	C,IV - 4,11,16
Cassia artemisioides	Feathery Cassia	B	L,VL	3-6'	-6'	E	C,IV,D - 10,
Ceanothus species	Wild Lilac	B,C,D	L,VL	varies	varies	E/D	C,IV,D - 4,6,7,10,12,23
Cercocarpus betuiloides	Mountain Mahogany	B,C,D	L,VL	5-12'	-10'	E	C,IV,D - 4,6,12,23
Choisya ternata	Mexican orange	B	M	6-8'	-8'	E	C,IV - 10,18
Cistus species	Rockrose	B	L,VL	varies	varies	E	CilV,D - 4,5,6,10,17,20
Clivia miniata	Clivia	A,B	H,M	2'	2'	E	C,IV - 3,10,14,18,19
Colocasia esculenta (caladium)	Elephant's Ear	A,B	H	-6'	-6'	E/D	C,IV - 3,14,18,19
Comarostaphylis diversifolia	Summer Holly	B,C,D	L,VL	6-10'+	6-8'+	E	C,IV,D - 6,7,12,18.23
Convolvulus cneorum	Bush Morning Glory	B	L	2-4'	2-4'	E	C,IV,D - 6,10
Coprosma pumila	NCN	B	M	-3'	8'	E	IV - 1,4,16,20
C. repens	Mirror Plant	B	M	-10'	-6'	E	IV - 1,4,16,20
Cotoneaster species	Cotoneaster	B	M,L	2-18'	3-15'	E/D	C,IV,D - 4,10,16
Cotyledon species	NCN	A,B	L	1-3'	1-3'	E	C,IV - 3,8,14
Crassula species	NCN	A,B	L	1-9'	1-9'	E	C,IV - 3,8,14
Cyrtomium falcatum	Holly Fern	A,B	H,M	2-3'	3-4'	E	C,IV - 15
Dasylirion longissima	Mexican Grass Tree	B	L,VL	-10'	8'	E	C,IV,D - 15
D. wheeleri	Sotol	B	L,VL	-6'	-6'	E	C,IV,D - 15

SHRUBS cont' PERENNIALS/SUCCULENTS

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Dietes bicolor	Fortnight Lily, African Iris	B	M,L	2-3'	2-3'	E	C,IV,D - 4,10,15,19
D. vegeta (iridioides)	Fortnight Lily	B	M,L	-4'	-4'	E	C,IV,D - 4,10,15,19
Echium fatuosum	Pride of Madeira	B	L,VL	-10'	-10'	E	C,IV - 4,6,7,10,19,20
Elaeagnus pungens & cultivars	Silverberry	B	M,L	6-15'	6-15'	E	C,IV,D - 16
Encelia californica	Coast Sunflower	B,C,D	L,VL	3-5'	3-5'	E/D	C,IV - 5,6,10,4,17
E. farinosa	Brittle Bush	B,C,D	L,VL	3-5	3-5	E/D	C,IV,D - 4,5,6,10,12,17
Erigonum giganteum	St. Catherine's Lace	B,C,D	L,VL	- 8'	- 8'	E	C,IV - 4,6,10,12,19,20
Escallonia species	Escallonia	B	M,L	2-15'	2-10'	E	C,IV - 4,10,16
Euonymus japonica & 'cultivars'	Evergreen Euonymus	B	M	2-10'	-6'	E	C,IV,D - 4,16
Fatsia japonica	Japanese Aralia	A,B	M	5-12'	6-10'	E	C,IV - 18
Fouquieria splendens	Ocotillo	A,B,C,D	VL	8-25'	8-15'	E	IV,D - 6,10,12
Fremontodendron species							
& 'cultivars'	Flannel Bush	B,C,D	L,VL	5-20'	-15'	E	C,IV,D - 4,6,10,12
Gardenia jasminoides	Gardenia	A,B	H	3-6'	3-5'	E	C,IV - 10,18
Garrya species	Silktassel	B,C,D	M,L	4-8'	4-8'	E	C,IV,D - 4,5,7,10,12
Hakea suaveolens	Sweet Hakea	B	L	10-20'	-15'	E	C,IV - 4,8
Hebe species & 'cultivars'	Hebe	B	M	3-6'	3-6'	E	C,IV - 4,5,7,10,16
Hemerocallis hybrids	Daylily	A,B	M,L	1-6'	2-6'	E/D	C,IV,D - 7,10,17,19
Hesperaloe parviflora	NCN	B,C	VL	3-4'	4-6'	E	IV,D - 6,7,19
Hibiscus rosa - sinensis	Chinese Hibiscus	B	M	-15'	-12'	E	C,IV - 3,7,10
Iris species	Bearded Iris	A,B	M	-30"	-2'	E	C,IV,D - 10
I.douglasiana	Douglas Iris	A,B,C	M,L	-2'	-2'	E	C,IV - 10,12,18
Isomeris(Cleome) arborea	Bladderpod	B,C,D	L,VL	3-6'	4-6'	E	C,IV,D - 4,6,10,12,20
Justicia brandegeana	Shrimp Plant	B	M	-3'	-4'	E	C,IV,D - 4,7,10
J. californica	Chuparosa	B,C,D	L,VL	2-5'	-4'	D	IV,D - 4,6,7,10,12
Keckiella cordifolia	Heart-Leaved Penstemon	B,C,D	L,VL	5-6'	8-10'	E/D	C,IV - 4,7,12
Kniphofia uvaria	Red-Hot Poker	A,B	L	2-3'	3-4'	E	C,IV,D - 3,7,10,19
Larrea tridentata	Creosote Bush	B,C,D	VL	4-8'	4-8'	E	IV,D - 6,12,23
Lavandula agnstifolia	English Lavender	B	L	3-4'	3-4'	E	C,IV,D - 4,6,7,10,17
L. dentata	French Lavender	B	L	3'	3'	E	C,IV,D - 4,6,7,10,17
L. intermedia	Lavandin	B	L	1-2'	2-3'	E	C,IV,D - 4,6,7,10,17
L. stoechas	Spanish Lavender	B	L	2-3'	3'	E	C,IV,D - 4,6,7,10,17
Leonotis leonrus	Lion's Tail	B	L	3-6'	4-6'	E	C,IV,D - 3,7,10,17
Leucophyllum candidum	Violet Silverleaf	B	L,VL	4-5'	4-5'	E	IV,D - 4,6,7,10
L. frutescens	Texas Ranger	B	L,VL	6-8'	6-8'	E	IV,D - 4,6,7,10
L. laevigatum	Chihuahuan Sage	B	L,VL	3-4'	4-5'	E	IV,D - 4,6,7,10
Limonium perezii	Sea Lavender	A,B	L	-2'	-2'	E	C,IV - 3,10,15,19,20
Liriope muscari	Big Blue Lily Turf	A,B	M	1-2'	2'	E	C,IV - 18
Lobelia laxflora	Mexican Bush Lobelia	B	L	2-3'	4-6'	E	C,IV,D - 4,7,10
Lupinus species	Lupine	B,C,D	L,VL	varies	varies	E/D	C,IV,D - 4,6,7,10,12,17
Mahonia aquifolium	Oregon Grape	B,C,D	M,L	6-8'	6-8'	E	IV,D - 4,6,11,12,18,23
M. fremontii	Desert Mahonia	B,C,D	L	3-12'	4-8'	E	C,IV,D-4,6,10,11,12,23
M. 'Golden Abundance'	NCN	B,C,D	M,L	5-6'	6'	E	IV,D-4,6,10,11,12,18,23
M. lomarifolia	Venetian Blind Mahonia	B,C	M,L	6-10'	6-10'	E	C,IV,D - 4,6,11,18,23
M. nevinii	Nevin Mahonia	B,C,D	L	3-10'	6-12'	E	C,IV,D-4,6,10,11,12,23
M. pinnata	California Holly Grape	B,C,D	M,L	4-5'	4-6'	E	C,IV-4,6,10,11,12,18,23
Malva sp.	Mallow	B,C	L	varies	varies	E/D	C,IV,D - 6,7,10,13
Mimulus sp. (Diplacus)	Monkey Flower	B,C,D	L	1-4'	1-4'	E	C,IV,D - 4,6,7,10,12
Myrtus communis 'compacta'	Dwarf Myrtle	B	M	5-8'	5-8'	E	C,IV,D - 16
Nandina domestica	Heavenly Bamboo	B	M	6-8'	4-5'	E	C,IV,D - 4,15

SHRUBS cont' PERRENIAL/SUCCULENTS

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
N.d. 'Compacta'	NCN	B	M	4-5'	3-4'	E	C,IV,D - 4,15
Nephrolepis cordifolia	Southern Sword Fern	A,B	M,L	2-3'	3-6'	E	C,IV - 4,15
Nerium oleander	Oleander	B	M,L	8-20'	10-20'	E	C,IV,D - 10,16
N.o. 'Petite Salmon'	NCN	B	M	3-4'	5-7'	E	C,IV - 3,10,16
Opuntia species	Prickly Pear, Cholla etc.	A,B,C,D	L,VL	varies	varies	E	C,IV,D - 8,12,14,23
Pelargonium species	Geranium	A,B	M,L	varies	varies	E	C,IV - 3,10,19
Penstemon species	Beard Tongue	A,B,C,D	L	varies	varies	E/D	C,IV,D - 7,10,12,17,19
Phlomis fruticosa	Jerusalem Sage	B	M,L	3-4'	3-5'	E	C,IV,D - 6,7,10,17,19
Phormium tenax	New Zealand Flax	B	M	5-9'	6'	E	C,IV,D - 4,19
P.t 'cultivars'	NCN	B	M	varies	varies	E	C,IV,D - 4,19
Photinia fraseri	Common Photinia	B	M,L	10-15'	10-20'	E	C,IV,D - 4,7,10,16
Pittosporum tobira	Tobira	B	M,L	6-15'+	8-15'	E	C,IV,D - 5,16
P.t.'Variegata'	NCN	B	M	5-8'	6-8'	E	C,IV,D - 5,16
P.t.'Wheeler's Dwarf'	Dwarf Pittosporum	A,B	M	1-3'	2-4'	E	C,IV,D - 16
Portulacaria afra	Elephant's Food	B	L	5-12'	6-12'	E	C,IV - 3,14
Punica granatum 'Nana'	Dwarf Pomegranate	A,B	L	3'	4'	D	C,IV,D - 7,11,20
Pyracantha species	Firethorn	B	M	varies	varies	E/D	C,IV,D - 4,16
Rhamnus california	Coffeeberry	B,C,D	M,L	3-15'	4-15'	E/D	C,IV,D - 12,21,23
R. crocea	Redberry	B,C,D	M,L	2-3'	3'	E	IV - 5,12,23
R.c. ilicifolia	Hollyleaf Redberry	B,C,D	M,L	3-15'	3-15'	E	IV - 5,12,23
Rhaphiolepis indica	India Hawthorn	B	M,L	4-8'	4-8'	E	C,IV,D - 4,5,10
R.i 'cultivars'	NCN	B	M,L	varies	varies	E	C,IV,D - 5,10
Rhus integrifolia	Lemonade Berry	B,C,D	L	3-10'+	6-20'	E	C,IV - 4,5,12,23
R.(Malosma) laurina	Laurel Sumac	B,C,D	L	6-15'+	6-15'	E	C,IV - 4,5,12,23
R. ovata	Sugar Bush	B,C,D	L	3-15'	6-15'	E	C,IV,D - 4,5,12,23
Ribes aureum	Golden Currant	B,C,D	L	3-6'	3-6'	D	C,IV,D - 7,10,12,23
R. malvaceum	Chaparral Currant	B,C,D	L	6-8'	6-8'	D	IV - 7,10,12,23
R. sanguineum & 'cultivars'	Red Flowering Currant	B,C,D	M,L	4-12'	4-8'	D	C,IV,D - 7,10,12,23
R. speciosum	Fuchsia-Flowering Gooseberry	B,C,D	L	3-6'	3-6'	D	C,IV,D - 4,7,10,12,23
R. viburnifolium	Catalina Perfume	B,C,D	L	3'	12'	E	C,IV - 7,10,12,23
Romneya coulteri	Matilija Poppy	B,C	L	-8'	4'	D	C,IV,D - 5,6,10,12,17
Rosa species	Rose	A,B	M	varies	varies	E/D	C,IV,D - 10,16,17
Salvia species	Sage	B,C,D	L	varies	varies	E/D	C,IV,D - 4,7,10,12,17,23
Simmondsia chinensis	Jojoba	B,C,D	L,VL	3-8'+	4-8'	E	C,IV,D - 4,6,11,23
Strelitzia reginae	Bird of Paradise	B	M	5'	4'	E	C,IV - 3,4,10,18
Trichostema lanatum	Wooly Blue Curls	B,C,D	L,VL	3-5'	5'	E	C,IV,D - 6,7,10,12,17
Tulbaghia violacea	Society Garlic	A,B	M	18'	2'	E/D	C,IV,D - 3,10,19
Viburnum species	Viburnum	B	M	varies	varies	E/D	C,IV,D - 3,7,10
Westringia fruticosa	Coast Rosemary	B	M,L	5-7'	6-12'	E	C,IV,D - 4,6,18
Xylosma congestum	Shiny Xylosma	B	M,L	15'+	15'+	E	C,IV,D - 5,16,18
X.c. 'Compacta'	Compact Xylosma	B	M,L	8-12'	8-12'	E	C,IV,D - 5,16,18
Yucca species	Yucca	B,C,D	L,VL	varies	varies	E	C,IV,D - 6,10,12,15

TREES

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT FT	SPREAD FT	E/D	GEOGRAPHICAL AREA-COMMENTS
Acacia farnesiana	Sweet Acacia	B	L	15-20'	15-20'	D	IV,D - 10
A. greggii	Catclaw Acacia	B,C,D	L,VL	15-25'	15-25'	E	IV,D - 10,12,21,23
A. saligna	Willow Acacia	B	L	15-35'	12-25'	E	C,IV,D - 10
A. smallii	NCN	B,C,D	L,VL	15-20'	15-20'	D	C,IV,D - 10,21,23
A. stenophylla	Shoestring Acacia	B	M,L	20-45'	10-20'	E	C,IV,D - 10,22
Acer macrophyllum	Bigleaf Maple	B,C,D	M	30-95'	30-95'	D	C,IV - 12,21,23
A. negundo	Box Elder	B	M,L	-60'	-50'	D	IV,D - 12,23
A. palmatum	Japanese Maple	B	M	-20'+	-20'	D	C,IV - 6
A. saccharinum	Silver Maple	B	M	40-100'	40-100'	D	C,IV,D - 22
Aesculus californica	California Buckeye	B,C,D	M,L	20+	30'	D	C,IV,D - 6,7,10,12,23
Agonis flexuosa	Peppermint Tree	B	M,L	25-35'	25-35'	E	C,IV - 3,22
Albizia julibrissin	Silk Tree	B	M	-40'	40'+	D	C,IV,D - 7,10,22
Alnus cordata	Italian Alder	B	M	40'	25'	D	C,IV,D - 22
A. rhombifolia	White Alder	B	H,M	50-90'	40'	D	IV - 12,21,23
Arbutus 'Marina'	NCN	B	M,L	-40'	-40'	E	C,IV,D - 5,7,10,11,23
A. unedo	Strawberry Tree	B	M,L	12-35'	20-35'	E	C,IV,D - 5,7,10,11,23
Archontophoenix							
cunninghamiana	King Palm	B	M	50'	10-15'	E	C,IV - 3,10,15
Bauhinia variegata	Purple Orchid Tree	B	M	20-35'	35'	E/D	C,IV - 4,10
Betula pendula	European White Birch	B	M	30-40'	30'	D	C,IV,D - 6,22
Brachychiton acerifolius	Flame Tree	B	L	60'	45-50'	D	C,IV,D - 10,22
B. populneus	Kurrajong Bottle Tree	B	L	30-50'	30'	E	C,IV,D - 10,22
Brahea armata	Blue Hesper Palm	B	L,VL	40'	10'	E	C,IV,D - 6,10,15
B. edulis	Guadalupe Palm	B	L,VL	30'	10'	E	C,IV,D - 6,15
Callistemon citrinus	Lemon Bottlebrush	B	M,L	-25'	-15'	E	C,IV,D - 4,7,10
C. viminalis	Weeping Bottlebrush	B	M,L	20-30'	-15'	E	C,IV - 4,7,10
Calodendrum capense	Cape Chestnut	B	M	30'	25-40'	D	C,IV - 7,10
Carya illinoensis	Pecan	B	M,L	70'	70'	D	C,IV,D - 6,11
Cercidium floridum	Blue Palo Verde	B,C,.D	L,VL	30'	30'	D	IV,D - 6,10,12,21,23
C. micropyllum	Littleleaf Palo Verde	B,C,D	L,VL	25'	25'	D	IV,D - 6,7,10,12,21,23
Cercis occidentalis	Western Redbud	B,C,D	M,L	20'	20'	D	C,IV,D - 7,10,12,23
Chamaerops humilis	Mediterranean Fan Palm	B	M	20'	20'	E	C,IV,D - 15
Chilopsis linearis	Desert Willow	B,C,D	L	-35'	-35'	D	IV,D - 6,7,10,12,23
Chionanthus retusus	Chinese Fringe Tree	B	M	20'	20'	D	C,IV - 10
Chitalpa tashkentensis	Chitalpa	B	M,L	20-30'	20-30'	D	C,IV,D - 7,10
Chorisia speciosa	Floss Silk Tree	B	M	30-60'	30-40'	D	C,IV,D - 10,22
Cinnamomum camphora	Camphor Tree	B	M,L	50'+	60'+	E	C,IV,D - 22
Cocculus laurifolius	Laurel Leaf Snail Seed	B	M	25'	30'+	E	C,IV,D - 4
Cordyline australis	Giant Dracaena	B	M	30'	15'	E	C,IV,D - 15
Cupaniopsis anacardioides	Carrot Wood	B	M	40'	40'	E	C,IV,D - 20
Dracaena drago	Dragon Tree	B	M,L	20'	20'	E	C,IV - 3,10,14,15
Eriobotrya deflexa	Bronze Loquat	B	M,L	20'	20'	E	C,IV,D - 10
Erythrina species	Coral Tree	B	M,L	Varies	Varies	D	C,IV,D - 3,7,8
Eucalyptus citriodora	Lemon-scented Gum	B	M,L	75-100'	-40'	E	IV,D - 1,7,22
E. maculata	Spotted Gum	B	M,L	60-80'	-40'	E	IV,D - 1,7,22
E. nicholii	Willow Peppermint	B	M,L	-40'	-30'	E	IV,D - 1,7,22
E. sideroxylon	Red Ironbark	B	M'L	35-80'	-35'	E	IV,D - 1,7,10
E. torquata	Coral Gum	B	M,L	-25'	-20'	E	IV,D - 1,6,7,10,20
Feijoa sellowiana	Pineapple Guava	B	M,L	18-25'	-25'	E	C,IV,D - 3,7,8,10,11,16
Ficus species	Fig	B	M,L	Varies	Varies	E,D	C,IV,D - 3,8

TREES cont'd

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT FT	SPREAD FT	E/D	GEOGRAPHICAL AREA-COMMENTS
Fraxinus augustifolia	Raywood Ash	B	M	25+35'	30'	D	C,IV,D - 22
F. dipetala	Foothill Ash	B,C,D	L,VL	18-20'	20-30'	D	C,IV,D - 12,21,22,23
F. latifolia	Oregon Ash	B	M	40-80'	40-60'	D	C,IV,D - 12,22,23
F. velutina	Arizona Ash	B,C	M,L	20-50'	30-50'	D	C,IV,D - 22,23
F.v. coriacea	Montebello Ash	B,C,D	M,L	20-40'	20-40'	D	C,IV,D - 12,22,23
Geijera parviflora	Australian Willow	B	M,L	25-30'	20-30'	E	C,IV,D - 6
Ginkgo biloba	Maidenhair Tree	B	M,L	35-80'	30-60'	D	C,IV,D - 6,22
Gleditsia triacanthos	Honey Locust	B	M,L	35-70'	-30'	D	IV,D - 6,22
Heteromeles arbutifolia	Toyon	B,C,D	L,VL	15-30'	15-30'	E	C,IV,D - 5,7,10,12,23
Hymenosporum flavum	Sweetshade Tree	B	M,L	20-40'	15-20'	E	IV - 10
Jacaranda mimosifolia	Jacaranda	B	M,L	25-40'	-30'	D	C,IV,D - 10,22
Juglans californica	Southern California Black Walnut	B,C,D	L	20-35'	30-45'	D	C,IV, - 5,6,12,23
Koelreuteria bipinnata	Chinese Flame Tree	B	M	20-40'	-45'	D	C,IV,D - 6,22
K. paniculata	Golden Rain Tree	B	M,L	20-35'	-40'	D	IV,D - 20,22
Lagerstroemia indica	Crape Myrtle	B	M,L	-30	-20	D	IV,D - 10,22
Liquidambar formosana	Chinese Sweet Gum	B	M	40-60'	25'	D	C,IV,D - 7
L. styraciflua	American Sweet Gum	B	M	60'	-25'	D	C,IV,D - 7
Liriodendron tulipfera	Tulip Tree	B	M	60-80'	40'	D	C,IV,D - 22
Lithocarpus densiflorus	Tanbark Oak	B,C,D	L	-60'	-40'	E	C,IV - 6,12,23
Magnolia species	Magnolia	B	M	Varies	Varies	E,D	C,IV,D - 6,8,10,22
Maytenus boaria	Mayten Tree	B	M,L	30-50'	30'	E	IV - 6,22
Metasequoia glypstroboides	Dawn Redwood	B	H,M	-80'	-40'	D	C,IV - 22
Metrosideros excelsus	New Zealand Christmas Tree	B	L,VL	-30'	-30'	E	C,IV - 5,6,7,10
Morus alba	White Mulberry	B	M,L	20-60'	30-50'	D	IV,D - 11,16
Olea europea	Olive	B	L,VI	-35'	20-30'	E	C,IV,D - 11,16,20
Parkinsonia aculeata	Jerusalem Thorn	B	L,VL	15-30'	15-30'	D	C,IV,D - 3,6,7,10,22,
Pistacia chinensis	Chinese Pistache	B	M,L	-60'	-50'	D	C,IV,D - 22
Pittosporum phillyraeoides	Willow Pittosporum	B	L	15-25'	10-15'	E	C,IV,D - 10
P. rhombifolium	Queensland Pittosporum	B	M	15-35'	-25'	E	C,IV,D - 22
P. undulatum	Victorian Box	B	M	-25'	-25'	E	C,IV - 22
Platanus acerifolia	London Plane Tree	B	L	40-80'	30-40'	D	C,IV,D - 22
P. racemosa	California Sycamore	B,C,D	L	50-100'	50-100'	D	C,IV,D - 12,21,22,23
Podocarpus gracilior	Fern Pine	B	M	-60'	-60'	E	C,IV,D - 16,22
P. macrophyllus	Yew Pine	B	M	-50'	-45'	E	C,IV,D - 16,22
Populus fremontii	Fremont Cottonwood	B,C,D	M	40-60'	40-60'	D	C,IV,V - 12,21,22,23
Prosopis glandulosa	Honey Mesquite	B	L,VL	25-30'	25-30'	D	C,IV,D - 5,7,22,23
P. g. var. 'torreyana'	Mesquite	B	L,VL	40-50'	40-50'	D	C,IV,D - 5,7,12,22,23
Prunus species & 'cultivars'	Cherry	B	varies	varies	varies	E,D	C,IV,D - 7,8,10,11,16
P. ilicifolia	Hollyleaf Cherry	B,C,D	L,VL	15-30'	15-30'	E	C,IV,D - 7,11,12,16,23
P. lyonii	Catalina Cherry	B,C,D	L,VL	20-45'	30'+	E	C,IV,D - 7,11,12,16,23
Punica granatum	Pomegranate	B	L	12-18'	-20'	D	C,IV,D - 7,11,20
Quercus agrifolia	Coast Live Oak	B,C,D	L,VL	30-70'	70'+	E	C,IV,D - 6,12,23
Q. chrysolepis	Canyon Live Oak	B,C,D	M,L	30-60'	20-60'	E	C,IV - 6,12,36
Q. douglasii	Blue Oak	B,C,D	M	50'	>50	D	C,IV,D - 6,12,23
Q. engelmannii	Engelmann Oak	B,C,D	I	60'	>60'	E	IV,D - 6,12,23
Q. ilex	Holly Oak	B	M	40-70'	40-70'	E	C,IV,D - 6,23
Q. kelloggii	California Black Oak	B,C,D	M	30-80'	-60'	D	IV - 6,12,23
Q. lobata	Valley Oak	B,C,D	L,VL	70'+	70'+	D	C,IV - 6,12,23
Q. palustris	Pin Oak	B	H,M	50-80'	5-70'	D	C,IV,D - 6,22,23
Q. rubra	Red Oak	B	H,M	-90'	90'	D	C,IV - 6,23

TREES cont'd

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT FT	SPREAD FT	E/D	GEOGRAPHICAL AREA-COMMENTS
Q. suber	Cork Oak	B	M	70-100'	-100'	E	C,IV,D - 6,23
Q. virginiana	Southern Live Oak	B	M,H	60'	100'	E/D	C,IV,D - 22
Q. wislizenii	Interior Live Oak	B,C,D	M,L	30-75'	75'+	E	IV,D - 6,12,23
Rhus lancea	African Sumac	B	L	20-30'	20-30'	E	C,IV,D - 20,22
Robinia ambigua	Locust	B	M,L	30-50'	-30'	D	IV,D - 1,7,10,22
R. pseudoacacia	Black Locust	B	L	-75'	30-40'	D	IV,D - 1,5,7,10,20,22
Sapium sebiferum	Chinese Tallow Tree	B	M	-35'	-35'	D	IV,D - 22
Schefflera actinophylla	Queensland Unbrella Tree	A,B	H,M	20'+	20'+	E	C - 3,8,18
S. pueckleri	Tupidanthus	A,B	H,M	20'+	20'+	E	C - 3,8,18
Syagrus romanzoffianum	Queen Palm	B	M	50'	-20'	E	C,IV - 15
Tabebuia chrysotricha	Golden Trumpet Tree	B	M	25-30'	-30'	E	C,IV - 6,10,22
T. impetiginosa	Pink Trumpet Tree	B	M	35'	-30'	E	C,IV - 6,10,22
Taxodium mucronatum	Montezuma Cypress	B	H-L	75'	35'	E/D	IV - 22
Tipuana tipu	Tipu Tree	B	M	-50'	-50'	D	C,IV - 10,22
Trachycarpus fortunei	Windmill Palm	B	M	-30'	-6'	E	C,IV,D - 15
Tristania conferta	Brisbane Box	B	L,VL	30-60'	-40'	E	C,IV - 22
Umbellularia californica	California Bay	B,C,D	L,VL	30-75'	30-75'	E	C,IV,D - 5,12,23
Zelkova serrata	Sawleaf Zelkova	B	M	60'	60'	D	IV,D - 22
Ziziphus jujuba	Chinese Jujube	B	M,L	20-30'	20-30'	D	C,IV,D - 11,20,22

APPENDIX III
PLANTING, SPACING, AND MAINTENANCE GUIDELINES

Information:

- Utilize slope distances for all measurements.
- Maintenance includes irrigation and annual removal of weeds, dead materials, and other undesirable flammable vegetation required to keep the fuel modified area in a fire safe condition as required by the approved fuel modification plan.
- During early stages of revegetation, plants are small and may be planted in increased densities to establish erosion control measures; however, as these plants mature and increase in size they must be thinned to meet fuel modification standards.
- The term "fire resistant" may be misleading. All plants will burn if there is enough heat and other conditions are right. Vegetative fire resistance may be enhanced through consistent irrigation.

General Requirements:

- Select plant material which will produce a coverage of permanent planting effectively controlling erosion.
- Consider utilizing deep-rooted plant material needing limited watering.
- Limit use of plants which are known to be especially flammable throughout your property.
- Limit use of plants which develop large volumes of foliage and branches.
- Limit use of plants which develop deciduous or shaggy bark.
- Limit use of plants which develop dry or dead undergrowth.
- **Recommended** minimum spacing is 30 feet between canopies for trees, and 15 feet or three times the diameter of the individual crowns for large shrubs. Limited grouping or alternative spacing may be approved.

Specific Requirements:

- Plants and trees must be individually planted, spaced and maintained in such a manner that they do not form a means of transmitting fire from native growth to the structure.
- Select plant species from the approved plant list for each zone and geographical area. Other species will be reviewed on a case by case basis. Except for dwarf varieties or mature trees small in stature, trees are generally not **recommended** within Zone A for reasons which go beyond fire issues and are therefore not included in the planting guide. Tree canopies may extend into Zone A when planted outside the zone.

- Limit massing of vegetation adjacent to structures; especially under eaves, overhangs, decks, etc.
- Provisions for continuous maintenance must be documented on the fuel modification plan and CCR's, i.e., by homeowner associations, property owners, or other entities.
- Conduct yearly maintenance to reduce fuel volumes, eliminate weeds, remove dead vegetation, etc. prior to annually brush inspections.
- Irrigation shall be designed to supplement native vegetation and establish planted natives and ornamentals.
- Irrigation shall be directed away from native oaks and be placed outside the dripline.

APPENDIX IV

GLOSSARY

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 a 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 around the perimeter of structures or developments in the wildland which are key points of defense/attack against encroaching wildfires or escaping structure fires.

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 TOLERANCE: 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 RETARDANCE: Relative comparison of plant species related to differences in fuel volume, inherent flammability characteristics, and ease of fire spread.

FIRE ZONE 4: Any geographic area designated pursuant to Section 6402 and Chapter 26.150 of Title 26, County Building Code to contain the type and condition of vegetation, topography, weather, and structure density to increase the possibility of conflagration fires.

FUELBREAK: 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 ZONE: A strip of land where combustible native or ornamental vegetation has been modified and partially or totally replaced with drought tolerant, fire retardant plants.

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.

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 materials such as dead sticks, branches, twigs, leaves or needles.

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

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.

SUBDIVISION: A parcel of land that is subdivided to create multiple individual lots for residential purposes in accordance with The State of California Subdivision Map Act.

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

UNDESIRABLE SPECIES: Those species of plants with inherent characteristics which make them highly flammable. 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.

URBAN INTERFACE: That line, area, or zone where structures and other human development meets or intermingles.

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: Any geographic area designated pursuant to Government Code Section 51178 to contain the type and condition of vegetation, topography, weather, and structure density to increase the possibility of conflagration fires.

c:\fmod.9

APPENDIX V

SUBMITTAL AND ROUTING PROCEDURES

SUBDIVISION AND ACCESS UNIT:

1. Applicants submitting proposed tract or parcel maps for projects located in the Very High Fire Hazard Severity Zone (VHFHSZ) or Fire Zone 4, will be referred to the Fuel Modification Unit for approval of their Preliminary Fuel Modification Plan. Notification will be given to the applicant by use of Form #266, "Conditions of Approval for Subdivisions - Incorporated," or by use of Form #267, "Conditions of Approval for Subdivisions - Unincorporated" during Subdivision Committee meetings. A representative from the Fuel Modification Unit will attend the subdivision meetings.

    a. Fuel Modification Plan Guidelines are available from the Fire Prevention Office, Forestry Division Office, Regional Planning One-Stop, Fuel Modification Unit, Area Prevention Office, Building and Safety, and Contract Cities.

    b. Fuel Modification Plans may be submitted by mail or in person to the Fuel Modification Unit.

2. The Subdivision and Access Unit will notify the Fuel Modification Unit in writing, using Form #266 or Form #267 regarding the impending tract/parcel map.

3. The Fuel Modification Unit will return a copy of the Preliminary Fuel Modification Plan Approval Letter to the applicant and the Subdivision and Access Unit before final map clearance is approved.

FIRE PREVENTION ENGINEERING:

1. Applicants submitting proposed building plans for projects located in the Very High Fire Hazard Severity Zone (VHFHSZ) or Fire Zone 4, will be referred to the Fuel Modification Unit for approval of their Preliminary and/or Final Fuel Modification Plan. Notification will be given to the applicant in the form of the "Very High Fire Hazard Severity Zone/Fire Zone 4" plan check sheet, during the initial review.

    a. Fuel Modification Plan Guidelines are available from the Fire Prevention Office, Forestry Division Office, Regional Planning One-Stop, Fuel Modification Unit, Area Prevention Office, Building and Safety, and Contract Cities.

b. Fuel Modification Plans may be submitted by mail or in person to the Fuel Modification Unit.

2. The following verbatim note will be required to be blueprinted on the final building plans, prior to obtaining approval. "This property is located within an area designated by the Fire Department as Very High Fire Hazard Severity Zone (VHFHSZ) or Fire Zone 4. A Final Fuel Modification Plan shall be submitted and approved, prior to building permit approval. Implementation of the approved Final Fuel Modification Plan and final inspection will be required prior to approval of occupancy." Submit three sets of plans to the Fuel Modification Unit.

3. Fire Prevention, Engineering will notify the Fuel Modification Unit in writing, using the Very High Fire Hazard Severity Zone (VHFHSZ) or Fire Zone 4 Building Requirement Checklist regarding the impending building permit request.

4. The Fuel Modification Unit will return a copy of the Final Fuel Modification Plan Approval Letter to the applicant and the Fire Prevention, Engineering Unit, before building permit clearance is approved.

5. The Fuel Modification Unit will return a copy of the Final Inspection and Receipt of CCR's approval letter to the applicant and the Fire Prevention Unit before final occupancy is approved.

APPENDIX G

Example Optional Fire Shelter Specifications

FIRE SAFE HOUSES & BUNKERS

Timbercrete has now launched a fire bunker or safety house constructed from arguably Australia's most fire resistant building product - "Timbercrete".

FRONT VIEW

SIDE VIEW

The Timbercrete team is committed to finding a practical solution to protect Australia's most precious and valuable assets - it's people. To this end we are pleased to announce a tangible and affordable solution to help protect and safeguard human life against possible future fire devastation.

Why Timbercrete?

Timbercrete is a remarkable, award-winning and environmentally friendly building product.
Timbercrete was invented in Australia, is Australian owned and manufactured. Patent protection has been granted in most of the world's population while in other countries the patent is still pending.

This award-winning building product boasts the highest possible fire rating, achieving an outstanding Fire Resistant Level (FRL) of 240/240/240 during tests conducted on a single skin wall (190 mm to 200 mm thick). CSIRO Fire tests on Timbercrete were conducted in accordance with Australian standard 1530 and part 4-1997. Test reference number FSV 1094. (For a full test report including photos refer to the website www.timbercrete.com.au). The test was carried out to determine Structural Adequacy, Integrity and Insulation.

The Definition of the Fire Resistant Level

FRL 240 / 240 / 240

The first 240/ - represents **Structural Adequacy Integrity**, this means that for a period of 240 minutes (four hours) the product being tested was able to support a load while subject to fire conditions. In the case of the Timbercrete test wall of 3 m long by 3 m high, it was able to support a load of 30 tonnes.

FRL 240 / 240 / 240

The second 240/ - represents **Integrity**, this means the product did not disintegrate or crack so as to see the flames of the fire or for gases to escape. Timbercrete maintained integrity for over 240 minutes at which time the test was terminated while the wall remained intact.

FRL 240 / 240 / 240

The third /240 - represents **Insulation** which means the product being tested did not transfer an average temperature reading that exceeds 180°C above the ambient temperature.

Structural Adequacy and Integrity

Most walls fail in these categories because they buckle severely flexing out as far as 150 mm before suddenly failing. A careful study of the deflection graph shows that the 3m high Timbercrete wall only deflected 4mm towards the furnace in the first 30 minutes. Then the wall corrected itself so that at the end of 240 minutes it had only moved 1mm from its original position. This ability to remain straight assists in its load-bearing capabilities.

FIRE SAFE HOUSES & BUNKERS cont.

Fantastic Insulation

With regard to the amazing insulating properties of Timbercrete, the ambient temperature at the beginning of the fire test was 30°. The average temperature of the wall being exposed to the flames (furnace temperature) was close to 1200°C. However the other side of the Timbercrete wall that was not exposed to direct flame eventually reached only 75° after 4 hours! (Remember a bushfire front may pass in less than 30 mins). This means the rise in temperature of the Timbercrete wall was only 45°C above the ambient air temperature even after 4 hours! With this level of outstanding performance, it stands to reason that Timbercrete is ideally suited for a fire resistant bunker.

Fire Resistant Bunker and Safe House Basic Specification and Features

- The bunker measures 3.6m long by 3.2m wide.
- Insulated metal fire resistant door. RFL -/240/30
- Fire resistant glass window. Triple glazed with the outside pane being heat proof ceramic glass, middle pane heat proof toughened glass and the inside pane is also heat proof toughened glass. Each pane is 5mm thick with a 50mm cavity between each layer to maximise insulation value.
- Fire resistant Timbercrete is also used on the roof. This is a similar thickness of product that has been tested as a wall, (190 mm thick). This added thickness is to maximise the overall fireproof nature of the structure.
- A Fire resistant spy hole is located near the door so that occupants can make a safe exit. The spy hole measures 210mm wide 180mm high and is constructed of triple pane fire rated glass as per the window.
- Each bunker is equipped with an air tank (similar to what fire-fighters use) that can be turned on as the fire storm approaches. This will slightly pressurise the bunker forcing excess cooler air out around the small gaps surrounding the fire resistant door. Pressurising the inside of the bunker prevents smoke or harmful gases entering the fire safe bunker. The tank will be sufficient to provide fresh air for all the occupants during the danger period of the fire storm.

The bunker should be installed close to every house that is being rebuilt. These bunkers may also be used in other applications as a multipurpose facility. When we speak of a "safe house", because of the design of the structure, it will not only be safe against fire but against theft. This makes it the ideal wine cellar, garden tool shed etc. It could even be used as a horse stable or a safe house for other loved animals.

While Timbercrete's main focus is to provide a product that will safeguard human life, we believe it is worth considering our product as people plan to build or rebuild their homes in fire prone areas.

The bunker will be sold in kit form. Visit the Timbercrete website under the section called "Contact us" to find your closest licensed Timbercrete manufacturer.

APPENDIX H

Alternative Project Analysis Memoranda

DUDEK

CORPORATE OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

MEMORANDUM

TO:

FIRM:

FROM: Mike Huff

DATE: July 20, 2010, 2010

SUBJECT: **Malibu Parks Public Access Restoration/Enhancement Plan – 2002 LCP Alternative**

PROJ. #: 4835-2

The Fire Protection Plan (FPP) prepared for the Malibu Parks Public Access Enhancement Plan – Public Works Plan by Dudek encompasses important fire protection policies, features, and processes that will be provided for the Proposed Project. Three other alternatives have been analyzed with regard to fire safety. This memorandum addresses the 2002 LCP Alternative compared to the Proposed Project and provides analysis and conclusions necessary for inclusion in the project Environmental Impact Report.

The following are the key similarities and differences from a fire protection perspective:

Ramirez Canyon Park (2002 LCP Alternative vs. Proposed Project)
No campsites vs. 5 campsites
5 day-use picnic areas vs. no picnic areas
No restroom facility vs. 3 new restroom facilities
68 total parking spaces vs. 73 total parking spaces, including for disabilities
No Via Acero access improvements vs. Via Acero Ingress/Egress Emergency Access Improvements
Retrofit existing structures to 7A codes vs. Retrofit existing structures to 7A codes

Escondido Canyon Park (2002 LCP Alternative vs. Proposed Project)
No campsites vs. 13 campsites
20 new parking spaces vs 17 new parking spaces
No camp host accommodation vs 1 RV camp host accommodation
1 new restroom facility vs 3 new restroom facilities

Latigo Trailhead (2002 LCP Alternative vs. Proposed Project)
No campsites (picnic tables replace) vs. 5 campsites
2 new parking spaces vs. 9 new parking spaces
No camp host accommodations vs. 1 RV camp host accommodation
No new restroom facility vs. 1 new restroom facility

Corral Canyon Park (2002 LCP Alternative vs. Proposed Project)
11 campsites (no camping in Area 2) vs. 16 campsites (including Area 2)
No fire engine shed vs. 1 fire engine shed

1 camp host accommodation vs. 1 camp host accommodation
2 total new restroom facilities (one single, one double) vs. 2 total new restroom facilities (2 single)
1 optional fire shelters vs. 2 optional fire shelters

Malibu Bluffs (2002 LCP Alternative vs. Proposed Project)
38 campsites vs. 32 campsites
36 new parking spaces vs. 52 new parking spaces
2 new camp host accommodations vs. 3 new camp host accommodations
1 pedestrian bridge between Areas 1 and 2 vs. up to 2 vehicle bridges connecting Areas 1 and 2
No day use picnic areas vs. 1 day use picnic area
8 new restroom facilities vs. 7 new restroom facilities
2 fire engine sheds vs. 3 fire engine sheds
2 optional fire shelter vs. 3 optional fire shelters

The primary difference between the Proposed Project and the 2002 LCP Alternative in each of the Park facilities is the number of campsites and parking areas. There will be a higher number of camping opportunities with the Proposed Project. Another key difference is the improved access to Ramirez Canyon Park on Via Acero Road that will occur with the Proposed Project but not with the 2002 LCP Alternative. A third key difference is the inclusion of a 10,000 gallon water tank by Camp Area 1 in Corral Canyon Park with the Proposed Project but not with the 2002 LCP Alternative. All other important fire protection measures will be equivalent.

Based on these project differences, the proposed policies, features, and processes described in the Proposed Project's FPP are applicable, without significant revision, to the 2002 LCP Alternative.

DUDEK

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605 THIRD STREET
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MEMORANDUM

TO:

FIRM:

FROM: Mike Huff

DATE: July 20, 2010

SUBJECT: **Malibu Parks Public Access Restoration/Enhancement Plan – Redesign Alternative**

PROJ. #: 4835-2

The Fire Protection Plan (FPP) prepared for the Malibu Parks Public Access Enhancement Plan – Public Works Plan by Dudek encompasses important fire protection policies, features, and processes that will be provided for the Proposed Project. Three other alternatives have been analyzed with regard to fire safety. This memorandum addresses the Redesign Alternative compared to the Proposed Project and provides analysis and conclusions necessary for inclusion in the project Environmental Impact Report.

The following are the key similarities and differences from a fire protection perspective:

Ramirez Canyon Park (Redesign Alternative vs. Proposed Project)
3 campsites vs. 5 campsites
27 new parking spaces (no parking at Lauber) vs. 36 new parking spaces (parking at Lauber)
Lauber Road emergency access improvements and limited public access vs. Via Acero emergency access improvements
1 camp host accommodation vs. 1 camp host accommodation
3 new restroom facilities vs. 3 new restroom facilities
Retrofit existing structures to 7A codes vs. Retrofit existing structures to 7A codes

Escondido Canyon Park (Redesign Alternative vs. Proposed Project)
4 campsites vs. 13 campsites
20 new parking spaces vs. 17 new parking spaces
1 camp host accommodation vs. 1 camp host accommodation
2 new restroom facilities vs. 3 new restroom facilities

Latigo Trailhead (Redesign Alternative vs. Proposed Project)
3 campsites vs. 5 campsites
2 new parking spaces vs. 9 new parking spaces

No camp host accommodation vs. 1 camp host accommodation
1 new restroom facility vs. 1 new restroom facility

Corral Canyon Park (Redesign Alternative vs. Proposed Project)
11 campsites (no camping in Area 2) vs. 16 campsites (including Area 2)
18 new parking spaces vs. 18 new parking spaces
1 camp host accommodation vs. 1 camp host accommodation
2 new restroom facilities vs. 2 new restroom facilities
1 fire engine shed vs. 1 fire engine shed
1 optional fire shelter vs. 2 optional fire shelters

Malibu Bluffs (Redesign Alternative vs. Proposed Project)
33 campsites vs. 32 campsites
30 parking spaces vs. 52 parking spaces
1 pedestrian bridge between Areas 1 and 2 vs. up to 2 vehicle bridges connecting Areas 1 and 2
No day use picnic areas vs. 1 day use picnic area
2 camp host accommodations vs. 3 camp host accommodations
7 new restroom facilities vs. 7 new restroom facilities
3 fire engine sheds vs. 3 fire engine sheds
3 optional fire shelters vs. 3 optional fire shelters

The primary difference between the Proposed Project and the Redesign Alternative in each of the Park facilities is the number of campsites and parking areas. There will be a higher number of camping opportunities with the Proposed Project. Another key difference is the improved access to Ramirez Canyon Park on Via Acero Road that will occur with the Proposed Project but not with the Redesign Alternative. All other important fire protection measures will be equivalent.

Based on these project differences, the proposed policies, features, and processes described in the Proposed Project's FPP are applicable, without significant revision, to the Redesign Alternative.