FIRE PROTECTION PLAN

HYATT REGENCY NEWPORT BEACH

CITY OF NEWPORT BEACH, CALIFORNIA

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Fire Marshal, Newport Beach Fire Department Date

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TABLE OF CONTENTS

Section **Page No.**

TABLE OF CONTENTS (*Cont.*)

Page No.

List of Appendices

List of Figures

List of Tables

Hyatt Regency Newport Beach - Fire Protection Plan

1.0 INTRODUCTION

This Fire Protection Plan (FPP) and related fire behavior modeling has been prepared by Dudek for the Hyatt Regency Newport Beach property (Hyatt Regency), a 25.70 acre site located at 1107 Jamboree Road in the City of Newport Beach, California. The property is located northwest of the intersection of Jamboree Road and Back Bay Drive, just north of Pacific Coast Highway (*Figure 1*). Primary access to the project site is from Jamboree Road, north of its intersection with Back Bay Drive. Secondary access through the hotel parking lot is from Back Bay Drive, west of Jamboree Road. The project lies within a coastal location that is highly urbanized except for a vegetated area immediately north of the property adjacent to the Newport Back Bay. The fire authority having jurisdiction (FAHJ) of this project site is the Newport Beach Fire Department (NBFD).

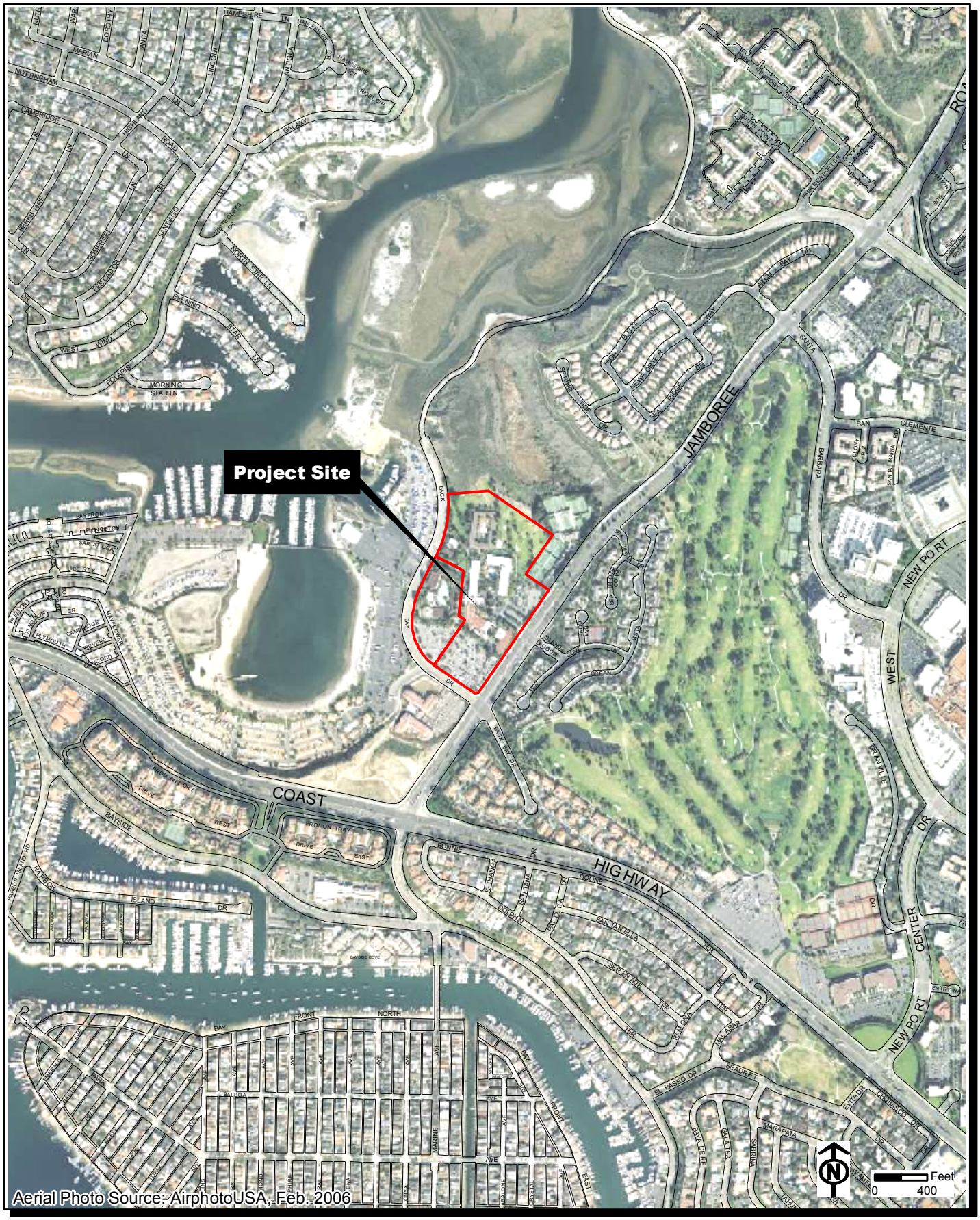
As outlined in this FPP, implementation of the proposed site improvements specified herein will result in lower fire risk for proposed structures than for structures currently existing onsite. This FPP provides a description of the required measures and consultant recommendations that will result in defensible structures adjacent to the open space immediately north of the project boundary. To achieve that goal, this FPP focuses on the system of fire protection features that combines structural enhancement and fuel modification customized to the site and based on fire behavior modeling.

The purpose of this plan is to generate and memorialize the fire safety requirements of the NBFD Fire Marshal. This FPP serves as an implementation plan for the preparation of final construction documents that shall incorporate the fire protection requirements detailed herein. Dudek's recommendations are based on site-specific characteristics and incorporate input from the NBFD. This FPP has been written using specification-consistent language because the recommendations herein become requirements with the approval of this FPP by the FAHJ.

2.0 SITE CHARACTERISTICS

The Hyatt Regency project includes the following characteristics:

- Located within a Special Fire Protection Area as defined by the NBFD
- Address – 1107 Jamboree Road
- Assessor's parcel number – 440-132-41



Hyatt Regency Newport Beach Fire Protection Plan

Vicinity Map

FIGURE 1

- Gross Site acreage – 25.70 acres
- Current Land Use – Hotel, Ballroom, Meeting Space, Golf Course
- Development Plan – Timeshare Facilities, Hotel
- Water supply – City of Newport Beach Municipal water system

2.1 Topography

The Hyatt Regency project site includes a 25.70 acre developed area located atop a small bluff east of the Newport Back Bay. The site has varied topography, but generally drops in elevation from the east to the west. Steeper slopes are located along the western and northern edges of the property with slope gradients averaging between 20% and 25%. Of note are the slopes immediately north of the project site dropping westward toward Back Bay Drive (22%) and northward toward undeveloped open space (25%). Elevations on site range from 17 feet to approximately 70 feet (above mean sea level).

2.2 Vegetation

Vegetation on the Hyatt Regency project site consists of non-native ornamental vegetation associated with the existing hotel grounds and golf course, including numerous tree and shrub species and a significant area covered with irrigated turf grass. Immediately north of the project boundary lies non-developed land characterized by coastal sage scrub (CSS), ruderal, and emergent wetland vegetation cover types. For the purposes of the fire behavior modeling conducted in support of this FPP, the SCAL18 model, representing coastal sage scrub cover, was applied to areas supporting CSS, given its proximity to proposed development.

2.3 Climate

The climate in the project area is typical of a Mediterranean climate; that is, warm, dry summers and wetter winters. Precipitation typically occurs between December and March. The prevailing wind is an on-shore flow with fall Santa Ana winds from the northeast that may gust to 50 mph or higher inland from this location. Because the project site is adjacent to the Back Bay and approximately 1.5 miles from the Pacific Ocean, higher humidity and subsequently higher vegetation moisture content than would be found inland are typical. The project area's climate has a large influence on the fire risk as drying vegetation (fuel moisture for 1-hour fuels of less than five percent is possible) during the summer months becomes fuel available to advancing flames should an ignition be realized.

Historical weather data for the region was utilized in determining fire modeling inputs for this site. Specifically, 90th percentile weather values derived from the Las Flores Remote Automated

Weather Station[1] (RAWS) were determined and utilized in the fire behavior modeling efforts conducted in support of this FPP. RAWS weather and fuel moisture data were processed utilizing the Fire Family Plus[2] software package to determine atypical weather conditions (90th percentile). The Las Flores station, while not located near the project site, was used as no stations in Orange County are situated in similar geographical settings. The Las Flores RAWS is located on Camp Pendleton in San Diego County, approximately 1.5 miles from the Pacific Ocean at an elevation of 100 feet, a similar geographical setting to that of the Hyatt Regency. All fire behavior modeling inputs are presented in Section 3.2.1 of this FPP.

2.4 Fire History

Fire history is an important component of a site-specific FPP. Fire history information can provide an understanding of fire frequency, fire type, most vulnerable project areas, and significant ignition sources, amongst others. According to a review of available historical fire perimeter data[3], there have been no recorded fires in the project area in the period between 1910 and 2006. The closest large fire burned approximately 3.5 miles southeast of the project site in 1993 (Laguna Fire). While the available fire perimeter data record captures fire information only for fires of a certain minimum size (300 acres and greater in size, as well as U.S. Forest Service (USFS) fires measuring 10 acres and greater between 1950 and 2003), local fire department information can augment this data gap. Based on information from the NBFD, the area adjacent to the Hyatt Regency property has not been subject to smaller fires, nor has it served as a notable source of ignitions to date.

2.5 Fire Department and Emergency Response

Initial response to the Hyatt Regency property is from Fire Station No. 3 located at 868 Santa Barbara Drive. The fire station is approximately 0.75 miles from the Hyatt Regency project site. Apparatus includes a Type I fire engine, a medic unit, and a responding truck. Backup response would be proved by Station 4 located at 124 Marine Avenue on Balboa Island, approximately 0.9 miles from the project site.

Based on the linear distance of roughly 4,000 feet from Station No. 3 to the midpoint of the Hyatt Regency project site, and an average response speed of 25 mph due to the in-City driving and intersections, the calculated response time would be approximately two minutes from Fire No. 3 and approximately 2.5 minutes from Fire Station No. 2. Ideal response time for most jurisdictions in urban areas is within four minutes.

[1] Las Flores RAWS Station: Latitude: 33.29º N, Longitude: 117.44º W, Elevation: 100 Feet
[2] FireFamily Plus. 2002. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 124 p., www.fire.org
[3] California Department of Forestry and Fire Protection Fire and Resource Assessment Program (FRAP): http://frap.cdf.ca.gov/

2.5.1 Impacts on Emergency Services

Cumulative impacts from development over time can cause emergency service decline and must be considered for each project. The addition of timeshare units to this facility is not expected to cause a significant decline in the level of emergency services to the City or to Station 3. It is estimated that the post project population on the Hyatt regency site will be slightly higher than the pre-project population, thereby placing a slightly increased demand on the fire fighting and emergency response capabilities of the NBFD. The requirements described in this FPP, including structural hardening, site-specific, fuel modification, and fire protection systems, amongst others, are designed to aid fire-fighting personnel and minimize the demand placed on the existing emergency service system.

3.0 RISK ANALYSIS METHODOLOGY

3.1 Field Assessment

Dudek conducted a field assessment of the proposed Hyatt Regency project site in order to document existing site conditions and determine potential actions for addressing the protection of structures proposed for the site. While on site, Dudek assessed the area's topography, vegetation and fuel loading, available setback area, and general susceptibility to wildfire.

Site photographs were collected and fuel conditions were mapped using 40-scale aerial images. Field observations were utilized to augment existing digital site data in generating the fire behavior models and formulating the recommendations contained in this FPP. Refer to *Appendix A* for site photographs and brief discussions of existing site conditions.

The primary focus area of this FPP is the building area atop the bluff in the northern portion of the property that drops down toward the Back Bay. Also in this area, a small ridge extends from the property edge northward with slopes dropping eastward and westward. These vegetated slopes are the focus area of this FPP and decline away from the development site at slope angles measuring between 22% and 25%. As previously discussed, this slope area includes coastal sage scrub, ruderal, and ornamental vegetation communities. The site biological report completed for the site should be referred to for more detailed discussion of the plant communities and individual plant species found on these slopes.

3.2 Fire Behavior Modeling

Following field data collection efforts, fire behavior modeling was conducted to document the type and intensity of fire that would be expected on this site given characteristic site features such as topography, vegetation, and weather. Fire behavior modeling includes a high level of analysis and information detail to arrive at reasonably accurate representations of how wildfire

would move through available fuels on a given site. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths and intensities, the BehavePlus 3.0.2[4] fire behavior fuel modeling system was applied using predominant fuel characteristics, slope percentages, and representative fuel models observed on site.

Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information.[5]

To be used effectively, the basic assumptions and limitations of BehavePlus must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations are the dead fuels less than one-quarter inch in diameter. These are the fine fuels that carry fire. Fuels greater than one inch have little effect while fuels greater than three inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within six feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
- Fourth, the BehavePlus fire behavior computer modeling system was not intended for determining sufficient fuel modification zone widths. However, it does provide the average length of the flames, which is a key element for determining "defensible space" distances for minimizing structure ignition.

Although BehavePlus has some limitations, it can still provide valuable fire behavior predictions which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur on a site. The type and quantity will depend upon

[4] Andrews, Patricia L.; Bevins, Collin D.; Seli, Robert C. 2004. BehavePlus fire modeling system, version 3.0:User's Guide. Gen. Tech. Rep. RMRS-GTR-106 Ogden, UT: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132p.

[5] Rothermel, Richard C. 1983. How to Predict the Spread and Intensity of Forest and Range Fires. USDA Forest Service Gen. Tech. Report INT-143. Intermountain Forest and Range Experiment, Ogden, UT

the soil, climate, geographic features, and the fire history of the site. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

The seven fuel characteristics help define the 13 standard fire behavior fuel models[6] and the more recent custom fuel models developed for southern California[7]. According to the model classifications, fuel models used in BehavePlus have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface to volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in BehavePlus. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom southern California fuel models:

- Grasses — Fuel Models 1 through 3
- Brush — Fuel Models 4 through 7, SCAL 14 through 18
- Timber — Fuel Models 8 through 10
- Logging Slash — Fuel Models 11 through 13

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 new fire behavior fuel models[8] developed for use in BehavePlus modeling efforts. These new models attempt to improve the accuracy of the standard 13 fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the new 40 fuel models:

- Non-Burnable — Models NB1, NB2, NB3, NB8, NB9
- Grass — Models GR1 through GR9
- Grass-shrub — Models GS1 through GS4
- Shrub — Models SH1 through SH9
- Timber-understory — Models TU1 through TU5
- Timber litter — Models TL1 through TL9

[6] Anderson, Hal E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service Gen. Tech. Report INT-122. Intermountain Forest and Range Experiment Station, Ogden, UT.

[7] Weise, D.R. and Regelbrugge, J. 1997. Recent chaparral fuel modeling efforts. Prescribed Fire and Effects Research Unit, Riverside Fire Laboratory, Pacific Southwest Research Station. 5p.

[8] Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

- Slash blowdown Models SB1 through SB4

For the purposes of this analysis, BehavePlus fire behavior modeling was conducted for the coastal sage scrub vegetation located immediately north of the project site. This vegetation type was classified as an SCAL18 fuel model, which is defined as California sage and buckwheat dominated scrub with a fuel bed depth of 4.5 feet.

Appendix C – Conceptual Fuel Modification Plan provides the locations of fire behavior modeling efforts and associated output values as they were modeled for the Hyatt Regency project site.

3.2.1 Behave Fuel Model Inputs

Table 1 provides a detailed description of the input variables used in the BehavePlus calculations.

TABLE 1
BehavePlus Fire Behavior Inputs

Input Name	Input Values
1-h Fuel Moisture	3%
10-h Fuel Moisture	4%
100-h Fuel Moisture	5%
Live Herbaceous Moisture	30%
Live Woody Moisture	60%
20-ft. Wind Speed (mph)	10 mph (gusts to 20 mph)
Slope (%)	Variable (0, 22, 25%)

Note: *Weather data used in model inputs was derived from Las Flores RAWS (elevation 100 feet above mean sea level).*

3.2.2 Fuel Model Output Results

The results from BehavePlus fire behavior modeling are presented in *Table 2*. Fire on the slopes represented by scrub vegetation (Fuel Model SCAL18) had modeling results indicating flame lengths between 27.6 and 37.2 feet, depending on slope and wind speed. Spread rates in these areas ranged from 1.3 to 2.5 mph (depending on slope and wind speed).

TABLE 2
BehavePlus Fire Behavior Modeling Results for SCAL18 Model

Wind Speed	BehavePlus Output	Slope Values		
		0%	22%	25%
10 mph	Surface Rate of Spread	1.29 mph	1.33 mph	1.34 mph
	Flame Length	27.6 feet	28.0 feet	28.1 feet
	Fireline Intensity	7,673 Btu/ft/s	7,914 Btu/ft/s	7,984 Btu/ft/s
20 mph	Surface Rate of Spread	2.41 mph	2.45 mph	2.47 mph
	Flame Length	36.8 feet	37.1 feet	37.2 feet
	Fireline Intensity	14,390 Btu/ft/s	14,631 Btu/ft/s	14,701 Btu/ft/s

It should be noted that the results presented in *Table 2* depict values based on inputs to the BehavePlus software. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

Result – On-Site Fire Potential

Given the climatic, vegetation, and topographic characteristics, along with the general lack of periodic fires in the area and fire behavior modeling results previously discussed in this FPP, the Hyatt Regency site is considered moderately vulnerable to wildfire. Under fall weather conditions, fire can move rapidly through sage scrub vegetation. The most common type of fire anticipated in the vicinity of the project area is a wind-driven brush fire originating north of the project site being pushed southward by Santa Ana winds. Flame lengths in some areas can be over 35 feet. The rate of spread is moderate due to volatile fuels, wind, and moderately low fuel moisture. A typical cause is related to roadways, such as Back Bay Drive (tossed cigarette, vehicle accidents, or car fire).

4.0 FIRE DEPARTMENT REQUIREMENTS

The following specific requirements for fire protection apply to the Hyatt Regency project. The listed requirements are consistent with City Fire Code (Chapter 9.04) and the NBFD Fuel Modification Plans and Maintenance Standard (Appendix B). Listed requirements in this FPP are not a complete list of structural requirements, but highlight important features to reduce the risk of vegetation fire igniting structures and structural fire igniting vegetation. The proposed project shall meet minimum water supply, fire flow, access, road width, turnaround, and hydrant requirements outlined by the NBFD.

4.1 Water Supply and Fire Flow

The water system for fire protection shall meet NBFD standards and be an approved water supply with hydrants and mains as required in the City of Newport Beach Fire Code (Chapter 9.04). Fire hydrants and fire flow capacity shall be approved by the Fire Chief. A reduction in required fire flow of up to 50 percent, as approved by the Fire Chief, may be allowed when the building is provided with an approved automatic sprinkler system. The resulting fire flow shall not be less than 1,500 gallons per minute. Proposed hydrant locations are noted on the exhibit in *Appendix C*. Flow test shall be completed within six months of the plan submittal to Newport Beach Fire Department.

Fire hydrants shall be of an approved type and have one 4-inch outlet and two 2.5-inch NST outlets, unless otherwise specified by the Fire Chief. Reflective blue dot hydrant markers shall be located in the center of the road to indicate location of a hydrant. Standard fire hydrants shall be provided at approved spacing on all roads, on the normal driving side of road, and as indicated by the Fire Chief.

4.2 Fire Access

Primary access to this project site is provided by an ingress and egress drive way off of Jamboree Road (39 feet wide). Additionally, a main access driveway separated by a planter area is provided off of Back Bay Drive (23- foot wide lanes in either direction), while another 20-foot wide Fire Access Lane is provided to Back Bay Drive adjacent to Building TS-7. New driveway entrance areas will be designed to City requirements with all-weather driving surface of A. C. paving over approved base and a capacity rating of at least 75,000 pounds, to accommodate fire apparatus. Current grades do not exceed 5 percent. The main access from Jamboree Road is not expected to be altered for this project. The proposed two-lane access from Back Bay Drive has a grade less than 5 percent. The proposed Fire Access Lane from Back Bay Drive has a grade of approximately 10 percent. Approach departure angles associated with the Hyatt Regency development driveways shall not exceed 3 degrees. There are no obstructions associated with site access. Trees shall be maintained such that no interference with fire department apparatus occurs.

- The minimum width of fire lanes shall not be less than 26 feet.
- There are no planned traffic calming devices.
- A fire apparatus turnaround with minimum 28-foot turning radius is provided adjacent to Building TS-7. Another turnaround is located adjacent to Building TS-4/Clubhouse.

- Unobstructed fire fighter access to all portions of the buildings via walkways, driveways or trails shall be provided. A minimum of 3 feet for firefighter access shall be maintained along both sides of all structures adjacent to fuel modification zones.
- The project site includes designated ingress and egress lanes off of Jamboree Road and Back Bay Drive.
- Ongoing maintenance of roads and access components (gates, signs, etc.) shall be maintained in perpetuity by the property owner.

4.3 Building Fire and Ignition Resistance

This project will include ignition resistant construction features consistent with current fire and building codes for the three proposed structures exposed to wildland vegetation (Buildings TS-1, TS-2, TS-3, and TS-4) (Appendix C). The following enhanced structural requirements shall be implemented for Buildings TS-1, TS-2, TS-3, and TS-4 on this project (in conformance with Chapter 7-A of the 2007 California Building Code):

- **Roofing.** Roofs shall have a Class A fire-rated roof assembly system to NBFD approval.
- **Fire-Resistive Walls.** The exposed side of exterior walls shall be constructed with materials approved for a minimum of 1 hour fire resistance rated construction on the exterior side or constructed with approved noncombustible materials. Exterior wall coverings must meet the 1 hour fire resistance requirement. Buildings shall have all under floor areas enclosed to the ground with exterior walls with a 1 hour fire rating.
- **Eaves Protection.** Eave assembly must be 1 hour fire rated construction. Eaves and soffits shall be protected on the exposed underside by material approved for a minimum of 1 hour fire resistance rated construction. Fascias are required and must be protected on the backside by materials approved for a minimum of 1 hour fire resistance rated construction or two-inch nominal dimension lumber.
- **Venting.** Attic ventilation openings, foundation or under floor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches each. Such vents shall be covered with noncombustible, corrosion resistant mesh with openings not to exceed ¼ inch, or shall be designed and approved to prevent flame or ember penetration in the structure. Ventilation openings and access doors shall not be located on the exposed side of the structure. Turbine attic vents shall be equipped to allow only one way direction rotation and shall not free spin in both directions. Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Galbe end and dormer vents shall be located at least 10 feet from property lines. Under floor ventilation openings shall be located as close to grade as practical.

- No attic ventilation openings or ventilation louvers shall be permitted in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas on the exposed side. Attic or foundation ventilation openings or those in vertical walls shall be covered with 1/4-inch mesh corrosion-resistant metal screen or other approved material that offers equivalent protection. Attic ventilation shall also comply with the requirements of the Uniform Building Code. Ventilation louvers and openings may be incorporated as part of access assemblies. Dryer and air conditioner vents shall not face the exposed side. Design, location, size, and quantity of vents shall be to approval of the NBFD.

- **Glazing.** Glass or other transparent, translucent, or opaque glazing which faces fire hazard areas shall be tempered glass, multilayered glass panels, or glass block, each having a fire protection rating of not less than 20 minutes. Glazing frames made of vinyl materials shall have welded corners and metal reinforcement in the interlock area, and be certified to ANSI/AAMA/NWWDA 101/1.S.2-97 structural requirements.
- **Skylights.** Shall be constructed of tempered glass or a class "A" rated assembly.
- **Insulation.** In the Special Fire Protection Areas, paper-faced insulation shall be prohibited in attics or ventilated spaces.
- **Gutters and Downspouts.** Gutters and downspouts shall be constructed of noncombustible material. Gutters shall be provided with the means to reduce the accumulation of leaf litter and debris that contributes to roof edge ignition.
- **Appendages and Projections.** Components attached to any structure shall not increase the risk of fire spread to the structure. Where fences attached to or immediately adjacent to structures face the wildland fuels, the first 5 feet of such fencing that connects to the structure shall be constructed of non-combustible heavy timber or fire-retardant pressure-treated wood or material.

  Unenclosed accessory structures attached to buildings with habitable spaces and projections, such as deck assemblies, shall be a minimum of 1-hour fire-resistance-rated assembly, which includes railings.

  Decks shall not be of a material which could ignite, melt, or otherwise fail during a fire, and decks and decking surfaces shall comply with one of the methods found in CBC Section 704A.4.1.1. No combustible awnings or canopies shall be permitted.

  Attached structures located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent shall have the under floor areas below the structure enclosed to within 6 inches of the ground, with exterior wall construction that meets 1 hour fire resistance rating.

- **Spark Arrestors.** All chimneys and other vents on heating appliances using solid or liquid fuels shall have spark arrestors of a type approved by the NBFD and approved Fire Code. Opening to be maximum 1/2 inch.
- **Exterior Doors.** Exterior doors shall be approved non-combustible construction, solid-core wood not less than 1 ¾ inches thick (45 mm), or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with the exterior glazing and skylights section.
- **Detached Accessory Structures.** Detached accessory structures located less than 50 feet from a building containing habitable space shall be a minimum 1 hour fire resistance rated assembly. When the detached structures is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have all under floor areas enclosed to within 6 inches of the ground, with exterior wall construction with a 1 hour fire resistance rating.

  Exception – The enclosure may be omitted where the underside of all exposed floors and all exposed structural columns, beams and supporting walls are protected as required for exterior 1 hours fire resistance rated construction or heavy timber construction.

4.4 Fire Protection Systems

Life safety fire sprinkler systems are required for hotel, restaurant, and multi-family structures. Buildings shall be fully sprinklered per the appropriate NFPA sprinkler standard for the occupancy. This interior sprinkler system is a part of the mitigation provided for alternative fuel modification zones.

- Occupancies such as the hotel and condominiums which are three or more stories in height, or 20 or more guests, shall have a sprinkler system in compliance with UBC standard 9-1 or NFPA 13. Actual system design is subject to final building design and the occupancy types in the structure

- All systems other than single-family detached dwelling systems to be remotely supervised to an approved 24/7 alarm company.

- A pressure of more than the minimum 20 PSI will most likely be needed to supply fire sprinklers in certain structures, and for certain in the hotel building. This must be determined in the water system design phase.

4.5 Defensible Space

Based on the risk assessment, fire behavior models (worst-case flame lengths of 37.2 feet within the sensitive CSS habitat area), and environmental constraints for this project site, an alternative to the standard fuel modification zone requirements in the City of Newport Beach (Fuel Modification Plans and Maintenance Standard) is proposed. Fuel Modification Zone widths for this site vary from 50 to 70 feet. To mitigate the reduced zone widths, this FPP outlines fire resistive construction features and alterations to the standard fuel modification zone requirements. The property boundaries and adjacent sensitive habitat limit the available fuel modification area available for some portions of the development. Specifically, the area in the north-west portion of the property is highly restricted with regard to available area for fuel modification. To that end, the following mitigating efforts are identified as options to the standard 170 feet of fuel modification, resulting in suitable defensible space. A graphical delineation of these proposed areas is presented in Appendix C.

- Areas where 70 or more feet of on and off-site fuel modification are achievable are considered adequate based on the fire behavior modeling and ignition resistant construction requirements outlined herein.
- Special Treatment Zone: The primary deficiency area for fuel modification zone width occurs along the western portion of the northern property boundary (Special Treatment Zone). This area, specifically adjacent to Building TS-1, allows a maximum of 50 feet of fuel modification adjacent to the sensitive CSS habitat immediately north of the project site.
    - To address this issue, the on and off-site area within the Special Treatment Zone adjacent to Building TS-1 shall be subject to planting and maintenance restrictions. Proposed options for the Special Treatment Zone include:
        - Maintained, irrigated landscaping limited to ground cover material only chosen from the approved NBFD fire resistive plant list. Ground cover to be irrigated and maintained at a height of 8 inches or less and free of dead plant material.
        - Native Carex grass species (*Carex spp*.) planted exclusively in the Special Treatment Zone and maintained at a height of 8 inches or less. Plant material shall be irrigated to maintain adequate fuel moistures.
    - A portion of this zone is off site. A maintenance agreement to be conveyed with deed shall be established for continued maintenance of this area.

- Zone A: This zone is the defensible space zone located immediately adjacent to proposed structures. This zone is entirely on site and shall include irrigated ground cover selected from the fire resistive plant list maintained at a height not to exceed 8 inches. Any shrubs or trees proposed for planting in this zone shall be in accordance with planting guidelines and spacing standards established in the NBFD Fuel Modification Standards (Appendix B). All combustible plant species shall be removed and the area shall be maintained free of dead and dying plant material. Maintenance shall include ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operations integrity, and programming of the irrigation system, regular trimming to prevent ladder fuels.
- Zone B: This zone lies entirely within the existing property maintenance easement north of the property boundary. Currently this area is maintained as a portion of the site golf course and no additional landscaping is anticipated for this area. This zone shall be irrigated, surface fuels shall be maintained at a height not to exceed 18 inches, and grasses shall not exceed 8 inches in height. All non-native trees and shrubs shall be removed from this zone (including 3 eucalyptus trees, several olive and pine trees, and several castor bean plants). Any proposed for planting in this zone shall be in accordance with planting guidelines and spacing standards established in the NBFD Fuel Modification Standards. All undesirable plant species shall be removed and the area shall be maintained free of dead and dying plant material.
- Zone C/D: This zone is located off-site outside of the existing maintenance easement, primarily on land owned by the City of Newport Beach. No additional landscaping is anticipated for this zone. Treatment of this zone shall include removal of all dead and dying vegetation. All fine fuels shall be reduced to a maximum of 8-12 inches in height. Trees and large tree-form shrubs which are being retained shall be pruned to provide clearance of three times the height of the under story plant material or 10 feet, whichever is higher. Dead and excessively twiggy growth shall also be removed. All existing plants or plant groupings except cacti, succulents, trees, and tree-form shrubs shall be separated by a distance of three times the height of the plant material or 20 feet, whichever is greater.
    - The stand of non-native trees (Eucalyptus, Monterey Pine, Aleppo Pine) located in the eastern portion of this zone, adjacent to the existing tennis courts on the neighboring property, shall be treated to remove dead and dying limbs and trees and to create vertical separation of tree canopies from understory fuels. As outlined in the NBFD Fuel Modification Standards, tree canopies shall be pruned and maintained such that clearance measuring three times the height of the under story plant material is achieved.
    - A portion of this zone is off site. A maintenance agreement to be conveyed with deed shall be established for continued maintenance of this area.

- The proposed block retaining wall adjacent to Buildings TS-2, TS-3, and TS-4 and between Zones A and B is depicted on site plans. This wall shall also serve to deflect radiant heat from a potential wildfire and augment the fuel modification and structural hardening components outlined in this FPP.
- **Construction Phase Fuel Modification** – The approved final fuel modification plan is to be installed under the supervision of the NBFD. Brush removal must be completed prior to commencing any flammable construction. Final inspection and approval must be obtained prior to the issuance of certificates of use and occupancy for any structures adjacent to the fuel modification area.
- Fuel Modification Zones shall be subject to an annual inspection conducted by a representative of the City in order to assure that the Fuel Modification Zone continues to be maintained in compliance with the applicable fuel modification requirements.

4.6 Vegetation Management

The fuel modification area along the northern boundary of the project lies partially on the Hyatt Regency property, partially on property owned by the City of Newport Beach, and partially on property owned by the Irvine Company.

- The proposed landscape plan/fuel modification zone plant palette shall be reviewed and approved by the NBFD. Landscape plans shall comply with all landscaping requirements.
- Defensible space vegetation management responsibility is assigned to persons/company(ies) owning buildings or structures on this property.
- Maintenance of defensible spaces shall occur annually, prior to May 1, or more often, as determined by the NBFD. Maintenance of the defensible space shall include modifying or removing non-fire-resistive vegetation and keeping leaves, needles, and other dead vegetative material regularly removed from roofs of buildings and structures.
- Maintenance and funding for vegetation management shall be required and enforced by deed encumbrances which follow with the property. Such deed encumbrances shall be reviewed and approved by NBFD Chief.
- An agreement with the neighboring property owners (as described above), to be conveyed with deed, for permanent maintenance of landscape area that also serves as extended fuel modification area for Hyatt property.
- Vegetation management shall be completed prior to the start of and continue throughout the construction phase. Prior to site demolition, adequate fuel breaks shall be constructed between demolition areas and existing flammable vegetation.
- Vegetation maintenance includes ensuring operation of irrigation systems.

- Vegetation maintenance is required following wind and rain storms to remove combustible plant-related debris from fuel modification zones.
- Caution must be exercised on steep slopes to minimize erosion with the removal of vegetation and the addition of irrigation.

5.0 CONCLUSION

This Fire Protection Plan is submitted as required in compliance with the City of Newport Beach Fire Department conditions for the proposed Hyatt Regency Newport Beach project. The recommendations in this document meet fire safety, building design elements, fuel management/modification, and landscaping recommendations of the City, unless otherwise stated, herein. Fire and Building Codes and other local, County and State regulations in effect at the time of each building permit application supersede these recommendations unless the FPP recommendation is more restrictive.

The recommendations provided in this FPP have been designed specifically for the proposed construction of timeshare units and associated site features adjacent the Newport Back Bay. In summary, the project would improve the fire ignition resistance of the on-site structures through enforcement of current building codes. In addition, fire behavior modeling indicates that the highest flame lengths anticipated for this site are 37 feet. The proposed fuel modification zones and structural hardening requirements would reduce the likelihood of structural ignition.

Ultimately, it is the intent of this FPP to guide, through code and mitigation requirements, the construction of buildings that are defensible from wildfire and in turn, do not represent significant threat of ignition source for the adjacent native habitat. It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not burn. Precautions and mitigating actions identified in this report are designed to reduce the likelihood that fire would impinge upon the proposed structures. There are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required ignition resistant construction features provided by the City's building and fire code and the mitigating fuel modification requirements provided in this FPP will accomplish the goal of this FPP to assist firefighters in their efforts to defend these structures and reduce the risk associated with this project's location.

APPENDIX A

Site Photographs

Photograph 1. View of CSS habitat immediately north of the project site. This photo depicts the relatively flat ridge top extending northward at a perpendicular angle from the property line.

Photograph 2. View of the north-facing slope adjacent to the proposed site of Building TS-3. Classified as ruderal vegetative cover, numerous exotic species exist in this area. A small portion of this area is proposed as Fuel Modification Zone C/D (non-irrigated, with shrubs maintained at 18 inches in height and grasses maintained at 8 inches in height).

Photograph 3. View of slope from Back Bay Drive.

Photograph 4. View from non-native tree stand in north-east corner of the property adjacent to existing tennis courts. This area lies within proposed Fuel Modification Zone C/D. Removal of dead limbs and clearance of vegetation from understory plants shall be necessary to meet horizontal separation requirements.

Photograph 5. View to the north of Zone B with CSS habitat in the background. Note flat terrain and lack of fuels in Zone B. Maintenance of this area will be important in providing defensible space.

Photograph 6. CSS habitat in foreground with the Back Bay in the background. Pink flags indicate the edge of CSS habitat. Irrigated non-native vegetation exists downhill and to the left of this area.

APPENDIX B

NBFD Fuel Modification Standard

CITY OF NEWPORT BEACH
FIRE DEPARTMENT

3300 Newport Blvd. Newport Beach, CA 92663 (949) 644-3106

Fuel Modification Plans and Maintenance Standard

Approved and Authorized by

Dennis Lockard
Fire Marshal

Established Date: July 1, 1999
Revised Date: March 5, 2002

TABLE OF CONTENTS

PURPOSE

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

GUIDELINES

I. APPLICABILITY

A. A fuel modification zone is a wide strip of land where combustible vegetation has been removed and/or modified and partially or totally replaced with drought-tolerant, fire-resistant plants to provide an acceptable level of risk from wildland and vegetation fires.

II. REQUIREMENTS

A. Development occurring within fire hazard zones (e.g., foothills, mountains, non-irrigated former farming areas, and other lands containing combustible vegetation) requires modification of natural vegetation at the urban interface.

1. Fuel modifications vary in complexity and are dependent upon the amount and arrangement of vegetation, topography, degree of exposure, local weather conditions, construction, design, and placement of structures.
2. A typical fuel modification installation consists of a 20-foot setback zone (Zone A), a 50-foot minimum irrigated zone (Zone B), with an additional 100-foot minimum of vegetation thinning zones (Zones C and D).
3. The minimum width of a fuel modification area is normally 170 feet and in some cases the width increases due to type of terrain and/or type and mass of vegetation.

III. SUBMITTAL CRITERIA: CONCEPTUAL FUEL MODIFICATION PLANS

Conceptual fuel modification plans must be approved by the NBFD, concurrent with review and approval of any tentative map. This is usually in conjunction with the approval of an urban edge treatment plan by the jurisdiction building/planning department.

Conceptual fuel modification plans show the areas of fuel modification necessary to achieve an acceptable level of risk regarding exposure of structures to combustible vegetation.

Submit three (3) sets of plans, prepared by a licensed landscape architect or other design professional with equivalent credentials, to the NBFD for review.

The following shall be included on the conceptual fuel modification plan: (also, refer to Attachment 1):

1. Delineation of each zone (setback, irrigated, and thinning) with a general description of each zone's dimensions and character; i.e., 50' - 70' Zone B, with existing vegetation removed, irrigated, and planted with drought-tolerant and fire-resistant plant material (see Attachment 8 – The Fire Resistive Plant List).
2. Identify removal of undesirable plant species in accordance with the NBFD Combustible Plant Species List (see Attachment 7).
3. Existing vegetation impacted by the required fuel modification and, if available, proposed vegetation to be planted in the fuel modification area. The conceptual plans should be **sensitive to rare and endangered species. The design professional must be prepared to address their disposition in the final plans.**
4. Identify the design of the proposed development, showing all property lines, contour lines, and the proposed location of all structures nearest to the fuel modification area, if available.
5. Photographs of the area showing the type of vegetation that currently exists, including height and density, and the topography of the site.
6. Description of the methods to be used for vegetation removal, if appropriate; i.e., mechanical or manual.
7. Location of emergency and maintenance access easements every 500' of the fuel modification area. Access easements shall have a minimum 10' width; alternatively, 5' wide easements provided every 250' is acceptable. Gates shall be a minimum of 36" wide. The easements shall be maintained free of vegetation or any structures greater than 5" in height.
8. Identify what exists 300' beyond the development property lines in all directions; i.e., construction, natural vegetation, roads, parks, etc. (Note: the NBFD may require additional information on a project-specific basis.)
9. Identify all proposed off-site fuel modification areas and appropriate legal agreements with adjacent property owners.
10. A note stating plant species will be selected from the NBFD Approved Plant Palette.

Note: Approval of a fuel modification plan by the NBFD does not eliminate the requirement to obtain appropriate environmental, grading, and zoning clearance/permits.

IV. SUBMITTAL CRITERIA: PRECISE FUEL MODIFICATION PLANS

Precise fuel modification plans shall include all information required on conceptual fuel modification plans and the following additional information (also, refer to Attachment 1):

1. Location and detail of permanent zone markers (see Attachment 4).
2. Plant palette to be installed in accordance with acceptable guidelines.
3. Irrigation plans and specifications.
4. Building footprints or statement that clearly indicates the limits of proposed development.

5. All applicable maintenance requirements and assignment of responsibility (see Section XI).
6. Tract or project conditions, CC&R and/or deed restrictions relative to fuel modifications (see Attachment 5).

Additional information and details to be included on plans:

On large developments, fuel modification zones should be located within common lettered lots owned and maintained by associations representing common ownership; e.g., homeowners' associations. The integrity and longevity of the fuel modification zones shall be maintained with sufficient tract/project conditions and CC&Rs to specifically identify the restrictions within the fuel modification areas. Likewise, when fuel modification zones are located on private property, deed restrictions are required to specifically identify the restrictions on any portion of the property subject to fuel modification. (See Attachment 2)

A plant palette must be submitted containing both the botanical and common names of all plant materials that are to be used. In the irrigated zone areas (which commonly serve as a screening buffer between development and open space/park land), plants must be fire resistant and drought-tolerant. Plant materials used outside of the irrigated zones must be fire resistant. **Note: All plants shall be selected from the NBFD Fire Resistive Plan List and specified for appropriate fuel modification zones.** (See Attachment 8.)

Note: There is no such thing as a plant that will not burn. The term *fire resistant* may be misleading. All plants will burn given sufficient heat and low moisture content. Vegetative fire resistance may be enhanced through adequate irrigation or precipitation.

Devices that burn solid fuel are not permitted in any fuel modification zone.

V. ZONE A – SETBACK IRRIGATED ZONE (SEE ATTACHMENTS 2 & 3)

The purpose of the setback zone is to provide a defensible space for fire suppression forces and to protect structures from radiant heat and convective heat. **No combustible construction shall be allowed within the 20-foot setback zone (Zone A). In no case shall the A Zone be less than 20 feet minimum.** This zone is to be located on a level graded area at the top or base of slope and immediately adjacent to the protected development.

Zone A – Specific Requirements

- Automatic irrigation systems to maintain healthy vegetation with high moisture content.
- Irrigation maintained outside the drip line of native oak trees.
- Pruning of foliage to reduce fuel load, vertical continuity, and removal of plant litter and dead wood.
- Complete removal of combustible plant species (see Attachment 7), minimal allowance for retention of selected native vegetation.

- Plants in this zone shall be highly fire resistant and selected from the approved fire resistive plant list for the setback zone and given geological area (see Attachment 8).
- Tree species are not allowed within 10 feet of combustible structures (measured from the edge of a full growth crown).
- Special consideration should be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions.
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operations integrity and programming of the irrigation system, regular trimming to prevent ladder fuels.

VI. ZONE B – IRRIGATED ZONE

This portion of fuel modification consists of irrigated landscaping. The plans must delineate that portion of the fuel modification area that will be permanently irrigated. Plant material selection, irrigation system design, and the landscape maintenance management plan shall sensitively address water conservation practices and include methods of erosion control to protect against slope failure. All irrigation shall be kept a minimum of 20 feet from the drip line of any Quercus (oak) species. These irrigated zones are a minimum of 50 feet in width and may be increased as conditions warrant. Zone B shall be cleared of all combustible plant species, irrigated, and planted with plants from the approved NBFD Fire Resistive Plant List. Exceptions to save desirable species may be submitted for approval by the Fire Chief on a site-specific basis. As in Zone A, combustible construction is not allowed in Zone B.

Zone B – 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.
- Native grasses, when used, shall be cut after annual seeding. Heights shall not exceed 8 inches.
- Irrigation shall be designed to supplement native vegetation, and establish and maintain planted natives and ornamentals.
- Any plants selected for planting in this zone shall be selected from the fire resistive plant list for irrigated zones for a given geographical area (see Attachment 8).
- Planting will be in accordance with planting guidelines and spacing standards established in this guideline (see Attachment 6).
- In Zones B, C, and D, sensitive and/or protected plant species shall be identified on the fuel modification plans and tagged in the field for further disposition.
- Trees and large tree-form shrubs (e.g., oaks, sumac, toyon) which are being retained with the approval of the agency having jurisdiction shall be pruned to provide clearance of **three times the height of the under story plant material or 10 feet, whichever is higher** (see Attachment 6). Dead and excessively twiggy growth shall also be removed.

- All existing plants or plant groupings except cacti, succulents, trees, and tree-form shrubs shall be separated by a distance of **three times the height of the plant material or 20 feet, whichever is greater** (see Attachment 6).
- Special consideration should be given for rare and endangered species, geological hazards, tree submitted for project approval, upon further review.
- Removal of undesirable plant species (see Attachment 7).

VII. ZONES C & D – THINNING ZONES – NON-IRRIGATED

Zone C is 50 feet in width and requires 50% thinning with removal of all dead and dying and undesirable species. Zone D is 50 feet in width and requires 30% thinning with removal of all dead and dying growth and undesirable species. Thinning zones are utilized to reduce the fuel load of a wildland area adjacent to urban developments, thereby reducing the radiant and convective heat of wildland fires. Thinning zones are located adjacent to the irrigated zone and can extend 100 feet or more into wildland areas. The percentage of vegetation to be removed is determined by many factors, including topography, exposure, and vegetation type and density. All dead and dying vegetation shall also be removed from the thinning zones. Additionally, undesirable plant species shall be removed from the thinning zones due to their susceptibility to wildland fire.

Zone C and D – Specific Requirements

- Removal of all dead and dying vegetation, all fine fuels reduced to a maximum of 8-12 inches in height.
- Native grasses, when used, shall be cut after annual seeding. Heights shall not exceed 8 inches.
- 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 Attachment 8).
- 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.
- Reduce fuel loading by reducing the fuel in each remaining shrub or tree without substantial decrease in the canopy cover or removal of tree holding root systems.
- In Zones B, C, and D, sensitive and/or protected plant species shall be identified on the fuel modification plans and tagged in the field for further disposition.
- Trees and large tree-form shrubs (e.g., oaks, sumac, toyon) which are being retained with the approval of the agency having jurisdiction shall be pruned to provide clearance of **three times the height of the under story plant material or 10 feet, whichever is higher** (see Appendix 6). Dead and excessively twiggy growth shall also be removed.
- All existing plants or plant groupings except cacti, succulents, trees, and tree-form shrubs shall be separated by a distance of **three times the height of the plant material or 20 feet, whichever is greater** (see Appendix 6).
- Maintain sufficient cover to prevent erosion without requiring planting.

VIII. ZONE E – INTERIOR/MANUFACTURED SLOPES

Zone E may or may not be applicable depending on the location and size of interior slopes. By definition, these slopes are planted and irrigated. However, the NBFD will make an interpretation based on topography, size, and plant palette as to whether improper maintenance could create a hazard to adjacent homes. If the potential for a hazard exists, the slopes shall be designated as fuel modification area Zone E. The intent is to ensure maintenance in accordance with Section XI and Attachment 5.

Zone E – Specific Requirements

- Designated as fuel modification for purposes of maintenance.
- Completely irrigated.
- Planted with approved NBFD Fire Resistive Plant List materials in accordance with Attachment 8.
- Some planting restrictions may apply depending on location and size.

IX. OFF-SITE FUEL MODIFICATION REQUIREMENTS

Due to the variable and sometimes considerable amount of land necessary for fuel modification, development proposals often include a request to have the required fuel modification zones extend onto adjacent properties. However, off site fuel modification is not recommended due to problems inherent with enforcement of regulations on adjacent property and the potential for confusion regarding responsibility for fuel modification on areas outside of legal ownership. Proper on-site fuel modification design should determine where development can safely be located and should be an integral part of the development proposal.

Should off-site fuel modification be deemed a necessity, appropriate legally recorded instruments must be established that clearly state the responsibilities and rights of the parties involved relative to the establishment and maintenance of the fuel modification area. Appropriate recorded documents must include a recorded agreement between all parties and a grant of easement for the establishment and maintenance of the fuel modification area. It should be understood that the allowance of off-site fuel modification by an adjacent property owner may affect the rights and/or use of the off-site property. All agreements for any off-site fuel modifications shall be integrated into fuel modification plans with a letter from adjoining property owner giving rights to maintain fuels.

X. FUEL MODIFICATION PLAN REVISIONS

Revisions to previously approved fuel modification plans shall follow procedures as established by NBFD. Note: Revisions to plans will not be reviewed without a copy of the original stamped approved plan for reference.

XI. FUEL MODIFICATION IMPLEMENTATION & REQUIRED INSPECTIONS

(Note: This section shall be placed verbatim on precise fuel modification plans)

- **Prior to Building Permit Issuance:** The developer shall complete that portion of the approved fuel modification plan determined to be necessary by the NBFD prior to the introduction of any combustible materials into the area. This generally involves removal and thinning of plant materials indicated on the approved plan.
- **Prior to Issuance of Certification of Occupancy:** The fuel modification must be installed, completed, and inspected. This includes physical installation of features identified in the approved precise fuel modification plan (including, but not limited to, plant establishment, thinning, irrigation, zone markers, access easements, etc). An NBFD Fire Inspector will provide written approval of completion at the time of this final inspection.
- **Prior to Home Owner Association (HOA) Acceptance (if applicable):** This activity must include the NBFD Fire Inspector and the following representatives:

  - Landscape design professional
  - Installing landscape contractor
  - HOA management representative
  - HOA landscape maintenance contractor

  The fuel modification shall be maintained as originally installed and approved. A copy of the approved plans must be provided to the HOA representatives at this time. Landscape professionals must convey ongoing maintenance requirements to HOA representatives.
- **Maintenance & Inspection:** The property owner is responsible for all maintenance of the fuel modification. All areas must be maintained in accordance with approved fuel modification plans. This generally includes a minimum of two growth reduction maintenance activities throughout the fuel modification areas each year (spring and fall). Other activities include maintenance of irrigation systems, replacement of dead or dying vegetation with approved materials, removal of dead plant material, and removal of undesirable species. The NBFD conducts regular inspections of established fuel modification areas. Ongoing maintenance shall be conducted *regardless* of the date of these inspections.

XII. FEES

Fees are charged for review of proposed fuel modification plans. These fees also include a limited number of inspections necessary to approve the installation. Additional fees will be applied should a project require additional inspections.

XIII. 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 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.

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

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

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

FIRE BREAK - Removal of growth, usually in strips, around housing developments to prevent a fire from spreading to the structures from open land or vice versa.

FIRE RESISTANT - Any plant will burn with enough heat and proper conditions. Resistance is often used as a comparative term relating to the ability of a plant to resist ignition.

FIRE RESISTIVE PLANT LIST - List of plants exhibiting characteristics of low fuel volume, fire resistance, and drought tolerance which make them desirable for planting in areas of high fire danger. (Attachment 8)

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

FUEL BREAK - A wide strip or block of land on which the native or pre-existing vegetation has been permanently modified so that fires burning into it can be more readily extinguished.

FUEL LOAD - The weight of fuels in a given areas, 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 material 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 that are generally removed as part of the fuel modification plan (see undesirable 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.

SPECIAL FIRE PROTECTION AREA & 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 due to increased possibility of conflagration fires. See Special Fire Protection Areas Guidelines and Very High Fire Hazard Severity Zones for Construction.

Attachment 1

FUEL MODIFICATION PLAN SUBMITTAL CHECKLIST

SUBMITTAL AND APPROVAL

	CONCEPTUAL PLANS	PRECISE PLANS
☐ Concurrent with review and approval of tentative map (if applicable)	X	
☐ Prior to issuance of grading permit (If no grading permit is required, prior to issuance of building permit)		X
☐ # of plans sets to the processing jurisdiction	3 sets	3 sets

PLAN REQUIREMENTS

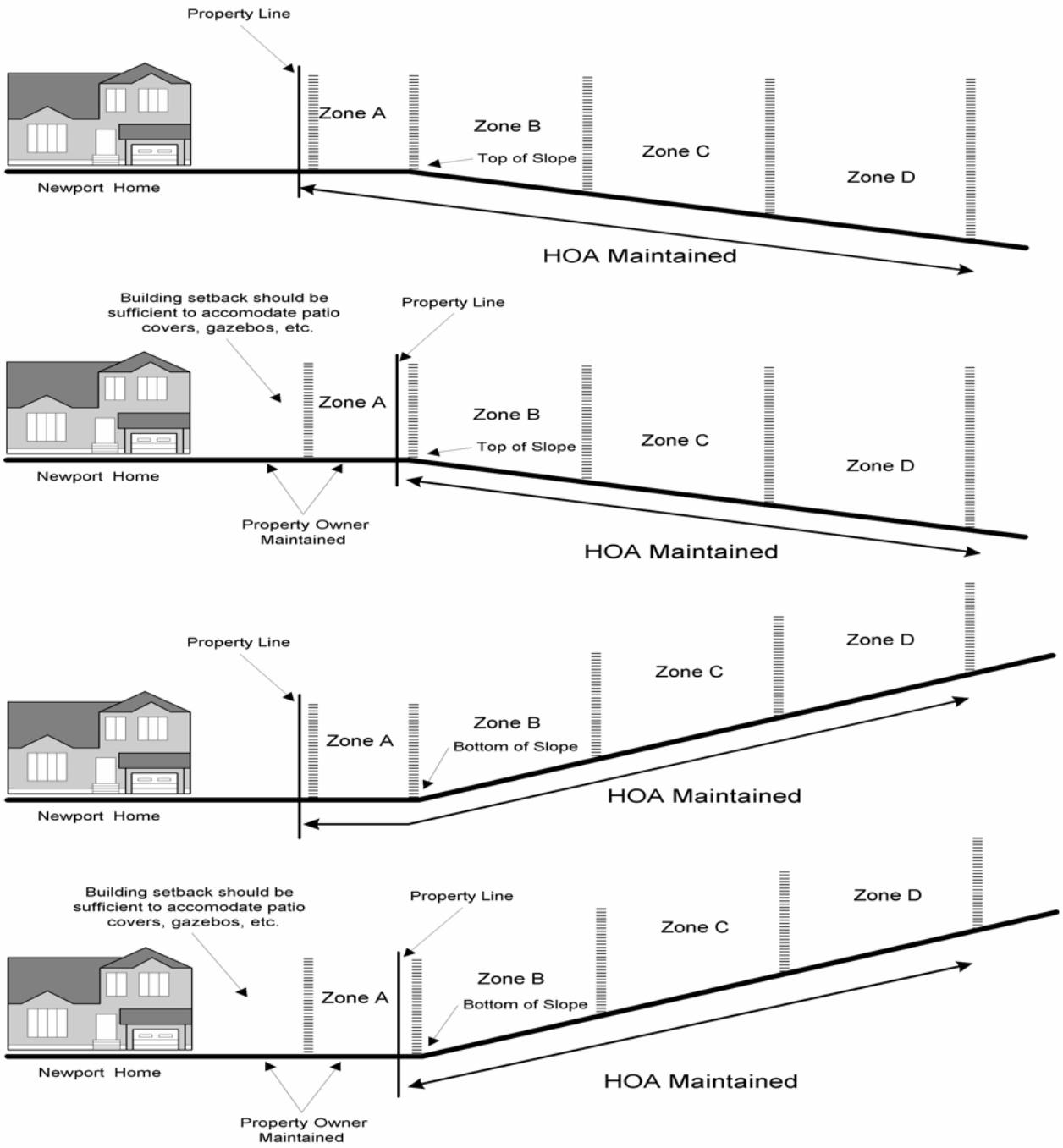
☐ Delineation of each fuel modification zone	X	X
☐ Scale Dimensions	X	X
☐ Site Characterization	X	X
☐ Photographs of area with emphasis on existing vegetation and topography	X	X
☐ Indication of permanent zone marker locations and detail		X
☐ Delineation of impacted existing vegetation	X	X
☐ Description of vegetation removal methodology	X	X
☐ Note indicating compliance with approved NBFD Fire Resistive Plant List	X	X
☐ Plant palette & specifications, including a plant legend (botanical & common names) for existing and proposed plants (1" = 40' min.)		X
☐ Designation of irrigated areas	X	X
☐ Irrigation plans and specifications (1" = 40' min.)		X
☐ Removal of combustible plant species	X	X

DELINEATION OF PROPOSED DEVELOPMENT:

☐ Property lines	X	X
☐ Contour lines	X	X
☐ Building lines or statement indicating limits of proposed development	X	X
☐ Emergency and maintenance access easements	X	X
☐ Description of existing improvements, land uses, & vegetation for 100' beyond property lines in all directions	X	X
☐ Statement, on the plans, of ultimate maintenance responsibility requirement	X	X
☐ On title sheet, indicate tract/project conditions, CC&Rs, and/or deed restrictions relative to fuel modification areas		X
☐ Location of all proposed offsite fuel modification areas with easements	X	X

Attachment 2

FUEL MODIFICATION CONFIGURATION OPTIONS



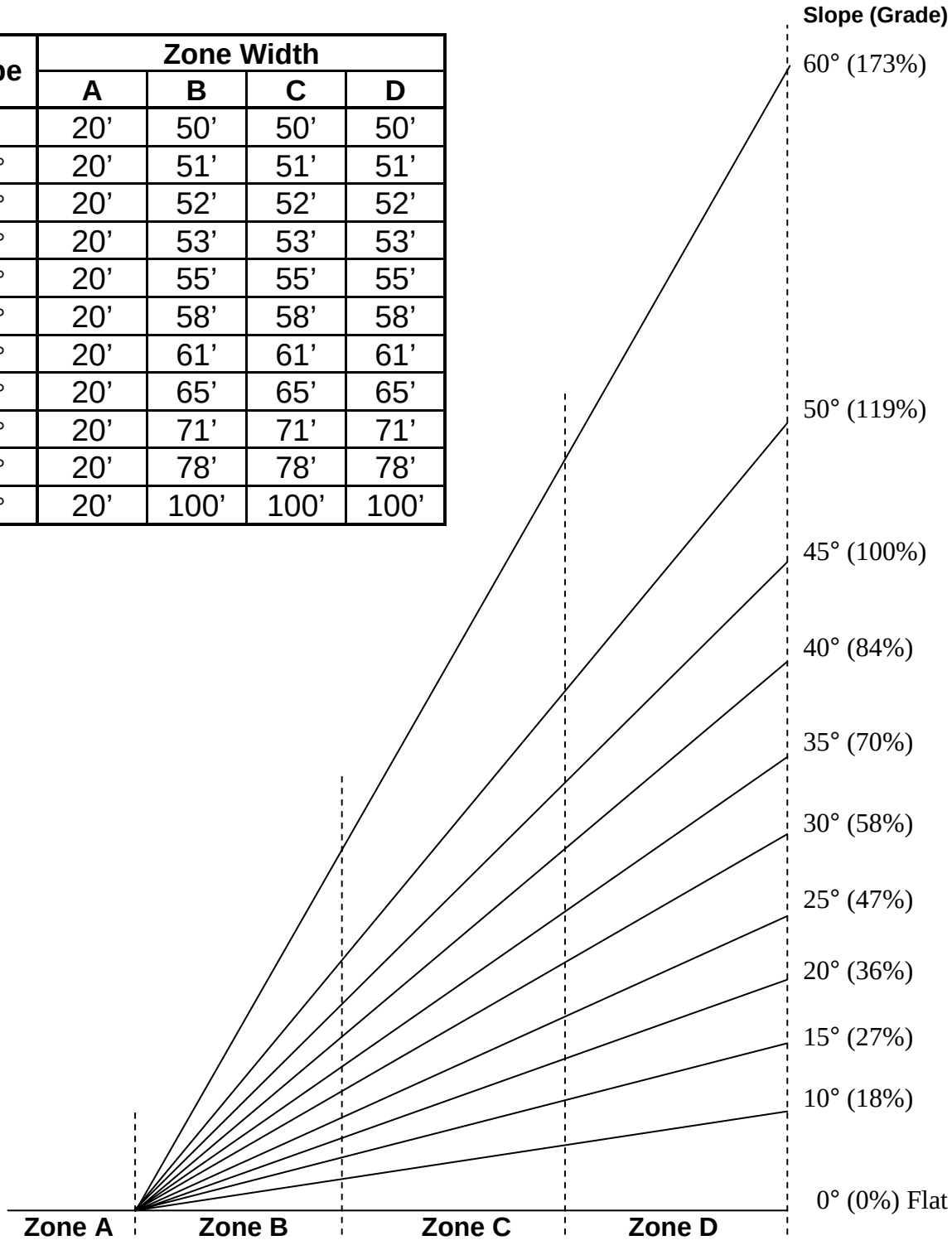
Note 1: The location of property lines will vary; however, if property lines must be located within fuel modification area, appropriate documentation (e.g., maintenance easements and/or deed restrictions) shall be established to: 1) restrict certain activities and uses on those portions of any private property within the fuel modification area, and 2) identify those responsible for the establishment and continued maintenance of the fuel modification area located on private property.

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

Attachment 3

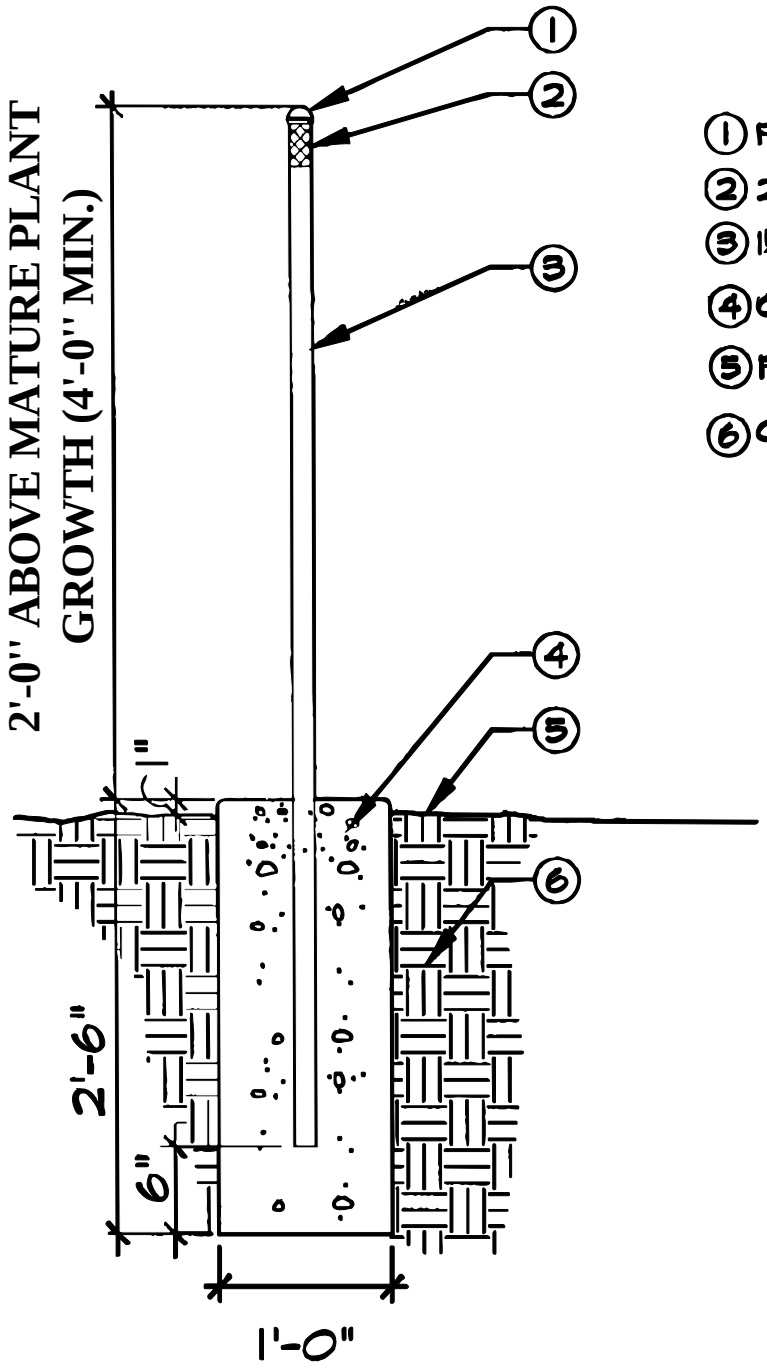
INCLINE MEASUREMENT FOR SELECTED SLOPES

Slope	Zone Width			
	A	B	C	D
0°	20’	50’	50’	50’
10°	20’	51’	51’	51’
15°	20’	52’	52’	52’
20°	20’	53’	53’	53’
25°	20’	55’	55’	55’
30°	20’	58’	58’	58’
35°	20’	61’	61’	61’
40°	20’	65’	65’	65’
45°	20’	71’	71’	71’
50°	20’	78’	78’	78’
60°	20’	100’	100’	100’



Attachment 4

ZONE MARKER DETAILS



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

Attachment 5

SAMPLE CC&R MAINTENANCE LANGUAGE

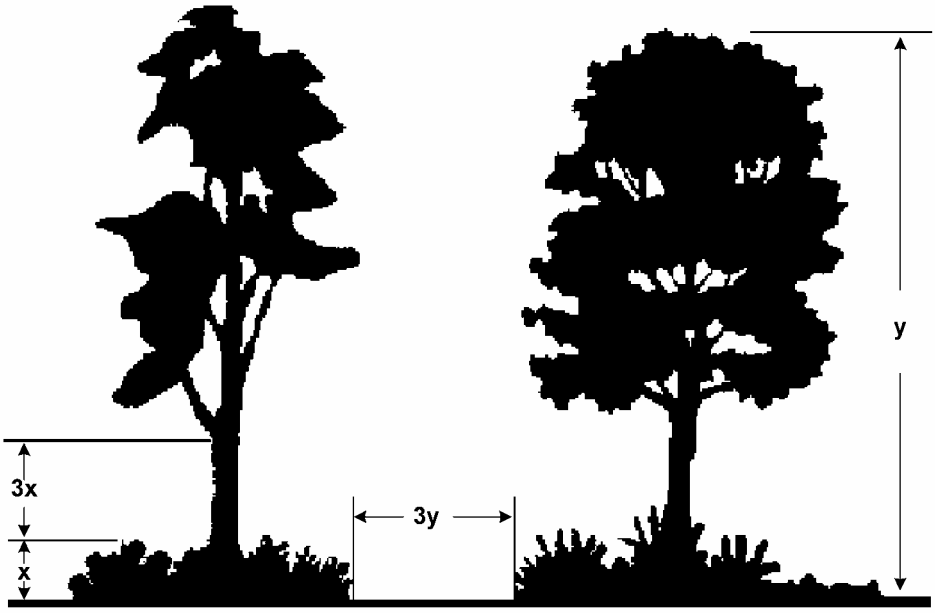
The following is a sample fuel modification maintenance condition intended to be inserted into CC&Rs:

> " _____ is responsible for maintaining, in accordance with any Newport Beach Fire Department requirements, those portions of the Covered Property identified as Fuel Modification Zones in Exhibit ___ and exhibits to any Supplemental Declarations. Construction or maintenance of structural improvements in Fuel Modification Zones, construction or maintenance of any combustible structural improvements on or adjacent to Fuel Modification Zones, and installation, maintenance, or modification of any landscaping improvements in Fuel Modification Zones that are inconsistent with any plant palette required by the Newport Beach Fire Department or the City of _____ are prohibited. All setback requirements with respect to the Fuel Modification Zones must be complied with."

Attachment 6

TREE AND SHRUB PRUNING AND SPACING

In Zones B, C, and D, sensitive and/or protected plant species shall be identified on the fuel modification plans and tagged in the field for further disposition. Trees and large tree-form shrubs (e.g., oak, sumac, toyon), which are being retained with the approval of the agency having jurisdiction, shall be pruned to provide clearance of three times the height of the understory plant material or 10 feet, whichever is higher (see figure below). Dead and excessively twiggy growth shall also be removed. Plant groupings specified in the NBFD "Fire Resistive Plant" must be spaced at a distance of at least three times the plant material height or 20 feet, whichever is greater (see figure below).



Note: Drawing not to scale

Attachment 7

UNDESIRABLE PLANT SPECIES

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be either physical or chemical. Physical properties that would contribute to high flammability include large amounts of dead material retained within the plant, rough or peeling bark, and the production of copious amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants are notorious for containing these volatile substances.

Plants with these characteristics shall not be planted in any of the fuel modification zones. Should these species already exist within these areas, they shall be removed because of the potential threat they pose to any structures. They are referred to as target species since their complete removal is a critical part of hazard reduction. These fire-prone plant species are (but not limited to):

MANDATORY REMOVAL (COMBUSTIBLE PLANT LIST)

Botanical Name	Common Name
Cynara cardunculus	Artichoke Thistle
Ricinus communis	Castor Bean Plant
Cirsium vulgare	Wild Artichoke
Brassica nigra	Black Mustard
Silybum marianum	Milk Thistle
Salsola australis	Russian Thistle/Tumblewood
Nicotiana bigelovii	Indian Tobacco
Nicotiana glauca	Tree Tobacco
Lactuca serriola	Prickly Lettuce
Conyza canadensis	Horseweed
Heterotheca grandiflora	Telegraph Plant
Anthemix cotula	Mayweed
Urtica Urens	Burning Nettle
Cardaria draba	Noary Cress, Perennial Peppergrass
Brassica rapa	Wild Turnip, Yellow Mustard, Field Mustard
Adenostoma fasciculatum	Chamise
Adenostoma sparsifolium	Red Shanks
Cortaderia selloana	Pampas Grass
Artemisia californica	California Sagebrush
Eriogonum fasciculatum	Common Buckwheat
Salvia mellifera	Black Sage

Ornamental	Common Name
Corraders	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine

Attachment 8

FIRE RESISTIVE PLANT LIST

(Note: Legend can be found on page 30)

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

23.	X	Aptenia cordifolia x 'Red Apple'	Red Apple Aptenia	Ground cover
24.	W	Arbutus unedo	Strawberry Tree	Tree
25.	W	Arctostaphylos 'Pacific Mist'	Pacific Mist Manzanita	Ground Cover
26.	W	Arctostaphylos edmundsii	Little Sur Manzanita	Ground Cover
27.	o	Arctostaphylos glandulosa ssp.	Eastwood Manzanita	Shrub
28.	W	Arctostaphylos hookeri 'Monterey Carpet'	Monterey Carpet Manzanita	Low Shrub
29.	N	Arctostaphylos pungens	no common name	Shrub
30.	N	Arctostaphylos refugioensis	Refugio Manzanita	Shrub
31.	W	Arctostaphylos uva-ursi	Bearberry	Ground Cover
32.	W	Arctostaphylos x 'Greensphere'	Greensphere Manzanita	Shrub
33.	N	Artemisia caucasica	Caucasian Artesmisia	Ground Cover
34.	X	Artemisia pycnocephala	Beach Sagewort	Perennial
35.	X	Atriplex canescens	Four-Wing Saltbush	Shrub
36.	X	Atriplex lentiformis ssp. breweri	Brewer Saltbush	Shrub
37.	o	Baccharis emoyi	Emory Baccharis	Shrub
38.	W o	Bacharis pilularis ssp. Consanguinea	Chaparral Bloom	Shrub
39.	X	Baccharis pilularis var. pilularis 'Twin Peaks #2'	Twin Peaks	Ground Cover
40.	o	Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground Cover
42.	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small Tree
43.	N n	Bougainvillea spectabilis	Bougainvillea	Shrub
44.	N n	Brahea armata	Mexican Blue Palm/Blue Hesper Palm	Palm
45.	N n	Brahea brandegeei	San Jose Hesper Palm	Palm
46.	N n	Brahea edulis	Guadalupe Palm	Palm
47.	o	Brickellia californica	no common name	Subshrub
48.	W o	Bromus carinatus	California Brome	Grass

49.	o	Camissonia cheiranthifiloa	Beach Evening Primrose	Perennial Shrub
50.	N	Carissa macrocarpa	Green Carpet Natal Plum	Ground Cover/Shrub
51.	X	Carpobrotus chilensis	Sea Fig Ice Plant	Ground Cover
52.	W	Ceanothus gloriosus 'Point Reyes'	Point Reyes Ceanothus	Shrub
53.	W	Ceanothus griseus 'Louis 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.	W	Ceanothus griseus var. horizontalis 'Yankee Point'	Yankee Point Ceanothus	Shrub
57.	o	Ceanothus megarcarpus	Big Pod Ceanothus	Shrub
58.	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
59.	o	Ceanothus spinosus	Green Bark Ceanothus	Shrub
60.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
61.	W	Cerastium tomentosum	Snow-in-Summer	Ground cover/Shrub
62.	W	Ceratonia siliqua	Carob	Tree
63.	W	Cercis occidentalis	Western Redbud	Shrub/Tree
64.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Ground Cover
65.	W	Cistus Crispus	no common name	Ground Cover
66.	W	Cistus hybridus	White Rockrose	Shrub
67.	W	Cistus incanus	no common name	Shrub
68.	W	Cistus incanus ssp. Corsicus	no common name	Shrub
69.	W	Cistus salviifolius	Sageleaf Rockrose	Shrub
70.	W	Cistus x purpureus	Orchid Rockrose	Shrub
71.	W	Citrus species	Citrus	Tree
72.	o	Clarkia bottae	Showy Fairwell to Spring	Annual
73.	o	Cneoridium dumosum	Bushrue	Shrub
74.	o	Collinsia heterophyllia	Chinese Houses	Annual

75.	W o	Comarostaphylis diversifolia	Summer Holly	Shrub
76.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
77.	W	Coprosma kirkii	Creeping Coprosma	Ground Cover/Shrub
78.	W	Coprosma pumila	Prostrate Coprosma	Low shrub
79.	o	Coreopsis californica	Califiornia Coreopsis	Annual
80.	W	Coreopsis lanceolata	Coreopsis	Ground Cover
81.	N	Corea pulchella	Australian Fuscia	Ground Cover
82.	W	Cotoneaster buxifolius	no common name	Shrub
83.	W	Cotoneaster congestus ‘Likiang’	Likiang Cotoneaster	Ground Cover/Vine
84.	W	Cotoneaster parneyi	no common name	Shrub
85.	X	Crassula lactea	no common name	Ground Cover
86.	X	Crassula multicava	no common name	Ground Cover
87.	X	Crassula ovata	Jade Tree	Shrub
88.	X	Crassula tetragona	no common name	Ground Cover
89.	W o	Croton californicus	California Croton	Ground Cover
90.	X	Delosperma ‘alba’	White trailing Ice Plant	Ground Cover
91.	o	Dendromecon rigida	Bush Poppy	Shrub
92.	o	Dichelostemma capitatum	Blue Dicks	Herb
93.	N	Distinctis buccinatoria	Blood-Red Trumpet Vine	Vine/Climbing vine
94.	N	Dodonaea viscosa	Hopseed Bush	Shrub
95.	X	Drosanthemum floribundum	Rosea Ice Plant	Ground Cover
96.	X	Drosanthemum hispidum	no common name	Ground Cover
97.	X	Drosanthemum speciosus	Dewflower	Ground Cover
98.	o	Dudleya lanceolata	Lance-leaved Dudleya	Succulent
99.	o	Dudleya pulverulenta	Chalk Dudleya	Succulent
100.	W	Elaeagnus pungens	Silverberry	Shrub

101.	o	Encelia californica	California Encelia	Small Shrub
102.	o *	Epilobium canum [Zauschneria californica]	Hoary California Fuschia	Shrub
103.	o	Eriastrum Sapphirinum	Mojave Woolly Star	Annual
104.	N	Eriobotrya japonica	Loquat	Tree
105.	o	Eriodictycon crassifolium	Thick Leaf Yerba Santa	Shrub
106.	o	Eriodictycon trichocalyx	Yerba Santa	Shrub
107.	W o	Eriophyllum confertiflorum	no common name	Shrub
108.	W	Erythrina species	Coral Tree	Tree
109.	N	Escallonia species	Several varieties	Shrub
110.	W o	Eschscholzia californica	California Poppy	Flower
111.	X	Eschscholzia mexicana	Mexican Poppy	Herb
112.	N	Euonymus fortunei	Winter Creeper Euonymus	Ground Cover
113.	N	Feijoa sellowiana	Pineapple Guava	Shrub/Tree
114.	N	Fragaria chiloensis	Wild Strawberry/Sand Strawberry	Ground Cover
115.	o	Frankenia salina	Alkali Heath	Ground Cover
116.	W	Fremontondendron californicum	California Flannelbush	Shrub
117.	X	Gaillardia x grandiflora	Blanketflower	Ground Cover
118.	W	Galvezia speciosa	Bush Snapdragon	Shrub
119.	W	Garrya ellipta	Silktassel	Shrub
120.	X	Gazania hybrids	South African Daisy	Ground Cover
121.	X	Gazania rigens leucolaena	Training Gazania	Ground Cover
122.	o	Gillia capitata	Globe Gilia	Perrenial
123.	W	Gilia leptantha	Showy Gilia	Perrenial
124.	W	Gilia tricolor	Bird’s Eyes	Perrenial
125.	W	Ginkgo biloba	Maidenhair Tree	Tree
126.	o	Gnaphalium californicum	California Everlasting	Annual

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

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

179.	o	Malacothamnus fasciculatus	Chapparal Mallow	Shrub
180.	X	Malephora luteola	Training Ice Plant	Ground Cover
181.	W	Maytenus boaria	Mayten Tree	Tree
182.	W	Melaleuca nesophila	Pink Melaleuca	Shrub
183.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
184.	o *	Mimulus species	Monkeyflower	Flower
185.	o	Mirabilis californica	Wishbone Bush	Perrenial
186.	N	Myoporum debile	no common name	Shrub
187.	W	Myoporum insulare	Boobyalla	Shrub
188.	W	Myoporum parvilfolium	no common name	Ground Cover
189.	W	Myoporum ‘Pacificum’	no common name	Ground Cover
190.	o	Nassella (stipa) lepidra	Foothill Needlegrass	Ground Cover
191.	o	Nassella (stipa) pulchra	Purple Needlegrass	Ground Cover
192.	o	Nemophilia menziesii	Baby Blue Eyes	Annual
193.	X	Nerium oleander	Oleander	Shrub
194.	o	Nolina cismontana	Chapparal Nolina	Shrub
195.	N	Nolina species	Mexican Grasstree	Shrub
196.	W	Oenothera belandieri	Mexican Evening Primrose	Ground Cover
197.	N	Oenothera hookeri	California Evening Primrose	Flower
198.	W	Oenothera speciosa	Show Evening Primrose	Perrenial
199.	X	Ophiopogon japonicus	Mondo Grass	Ground Cover
200.	o *	Opuntia littoralis	Prickly Pear	Cactus
201.	o *	Opuntia oricola	Oracle Cactus	Cactus
202.	o *	Opuntia prolifera	Coast Cholla	Cactus
203.	W	Osmanthus fragrans	Sweet Olive	Shrub
204.	X	Osteospermum fruticosum	Training African Daisy	Ground Cover

205.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
206.	W	Pelargonium peltatum	Ivy Geranium	Ground Cover
207.	X	Penstemon species	Beard Tongue	Shrub
208.	W	Photinia fraseria	no common name	Shrub
209.	W	Pistacia chinesis	Chinese Pistache	Tree
210.	X	Pittosporum undulatum	Victorian Box	Tree
211.	o	Plantago erecta	California Plantain	Annual
212.	**	Plantago insularis	Woolly Plantain	Annual
213.	X	Plantago sempervirens	Evergreen Plantain	Ground Cover
214.	W	Plantanus racemosa	California Sycamore	Tree
215.	W	Plumbago auritulata	Plumbago Cape	Shrub
216.	o	Popolus fremontii	Western Cottonwood	Tree
217.	X	Portulacaria afra	Elephant's Food	Shrub
218.	o	Potentilla glandulosa	Sticky Cinquefoil	Subshrub
219.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground Cover
220.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
221.	o	Prunus ilicifolia ssp. Ilicifolia	Holly Leafed Cherry	Shrub
222.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
223.	N	Punica granatum	Pomegranate	Shrub/Tree
224.	W	Puya species	Puya	Succulent/Shrub
225.	W	Pyracantha species	Firethorn	Shrub
226.	o	Quercus agrifolia	Coast Live Oak	Tree
227.	o n *	Quercus berberdifolia	California Scrub Oak	Shrub
228.	o n *	Quercus dumosa	Coastal Scrub Oak	Shrub
229.	X	Quercus engelmannii	Engelmann Oak	Tree
230.	X	Quercus suber	Cork Oak	Tree

231.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
232.	o	Rhamnus californica	California Coffee Berry	Shrub
233.	o	Rhamnus crocea	Redberry	Shrub
234.	o	Rhamnus crocea ssp. Ilicifolia	Hollyleaf Redberry	Shrub
235.	N	Rhaphiolepis species	Indian Hawthorne	Shrub
236.	o	Rhus integrifolia	Lemonade Berry	Shrub
237.	N	Rhus lancea	African Sumac	Tree
238.	o n	Rhus ovata	Sugarbush	Shrub
239.	o	Ribes aureum	Golden Currant	Shrub
240.	o	Ribes indecorum	White Flowering Currant	Shrub
241.	o	Ribes speciosum	Fuschia Flowering Goosebberry	Shrub
242.	W	Ribes viburnifolium	Evergreen currant	Shrub
243.	o *	Romneya coulteri	Matilija Poppy	Shrub
244.	X	Romneya coulteri ‘White Cloud’	White Cloud Matilija Poppy	Shrub
245.	W n	Rosmarinus officinalis	Rosemary	Shrub
246.	W n	Salvia greggii	Autums Sage	Shrub
247.	W n	Salvia sonomensis	Creeping Sage	Ground Cover
248.	o	Sambucus mexicana	Mexican Elderberry	Tree
249.	W	Santolina chamaecyparissus	Lavender Cotton	Ground Cover
250.	W	Santolina virens	Green Lavender Cotton	Shrub
251.	o	Satureja chandleri	San Miguel Savory	Perennial
252.	o	Scirpis scutus	Hard Stem Bulrush	Perennial
253.	o	Scirpus californicus	California Bulrush	Perennial
254.	X	Sedum acre	Goldmoss Sedum	Ground Cover
255.	X	Sedum album	Green Stonecrop	Ground Cover
256.	X	Sedum confusum	no common name	Ground Cover

257.	X	Sedum lineare	no common name	Ground Cover
258.	X	Sedum x rubrotinctum	Pork and Beans	Ground Cover
259.	X	Senecio serpens	no common name	Ground Cover
260.	o	Sisyrinchium bellum	Blue Eyed Grass	Ground Cover
261.	o	Solanum douglasii	Douglas Nightshade	Shrub
262.	o	Solanum xantii	Purple nightshade	Perennial
263.	W	Stenicarpus sinuatus	Firewheel Tree	Tree
264.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
265.	W	Strelitzia reginae	Bird of Paradise	Perennial
266.	o	Symphoricarpos mollis	Creeping Snowberry	Shrub
267.	W	Tecoma stans (Stenolobium stans)	Yellow Bells	Shrub/Small Tree
268.	X	Tecomaria capensis	Cape Honeysuckle	Ground Cover
269.	N	Teucarium chamedrys	Germander	Ground Cover
270.	N	Thymus serpyllum	Lemon Thyme	Ground Cover
271.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
272.	o	Trichosstems lanatum	Woolly Blue Curls	Shrub
273.	X	Trifolium hirtum ‘Hyron’	Hyron Rose Clover	Ground Cover
274.	X	Trifolium fragerum ‘O’Connor’s’	O’Connor’s Legume	Ground Cover
275.	o	Umbellularia californica	California Laurel	Tree
276.	o	Verbena lasiostachys	Western Vervain	Perennial
277.	N	Verbena peruviana	no common name	Ground Cover
278.	X	Verbena species	Verbena	Ground Cover
279.	X	Vinca Minor	Dwarf Periwinkle	Ground Cover
280.	o	Vitis girdiana	Desert Wild Grape	Vine
281.	X	Vulpia myuros ‘Zorro’	Zorro Annual Fescue	Grass
282.	W	Westringia fruticosa	no common name	Shrub

283.	W	Xannithorrhoea species	Grass Tree	Perennial accent/shrub
284.	W	Xylosma congestum	Shiny Xylosma	Shrub
285.	X	Yucca species	Yucca	Shrub
286.	o	Yucca whipplei	Yucca	Shrub

Legend:

X = Plant species prohibited in wet and dry fuel modification zones adjacent to reserve lands. Acceptable on all other fuel modification locations and zones.

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

o **=** Plant species native to Orange County. Acceptable in all fuel modification wet and dry zones in all locations.

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

***** = If locally collected.

****** = Not native but can be used in all zones.

n = Plant species acceptable on a limited use basis. Refer to qualification requirements following plant palette.

Approved Plant Palette – Qualification statements for Select Plant Species

2. Acacia redolens desert carpet: May be used in the upper ½ of the "B" fuel modification zone. The plants may be planted at 8' on center, maximum spacing in meandering zones not to exceed a mature width of 24' or a mature height of 24".

43. Bougainvillea spectabilis (procumbent varieties): Procumbent to mounding varieties may be used in the mid "B" fuel modification zone. The plants may be planted in clusters at 6' on center spacing not to exceed eight plants per cluster. Mature spacing between individual plants or clusters shall be 30' minimum.

44. Brahea armata: Additional information may be required as directed by NBFD.

45. Brahea brandegeel: Additional information may be required as directed by NBFD.

46. Brahea edulis: May be used in upper and mid "B" fuel modification zone. The plants shall be used as single specimens with mature spacing between palms of 20' minimum.

129. **Hakea Suaveolens:** May be used in the mid "B" fuel modification zone. The plants shall be used as single specimens with mature spacing between plants of 30' minimum.

136. Heteromeles arbutifolia: May be used in the mid to lower "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30' minimum.

164. Liquidambar styraciflua: May be used in the mid "B" fuel modification zone. The plant shall be used as single specimens with mature spacing between trees and 30' minimum.

227. Quercus berberdifolia: Additional information may be required as directed by NBFD.

228. Quercus dumosa: May be used in the mid to lower "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30' minimum.

238. Rhus ovata: May be used in the mid to lower "B" fuel modification zone of inland areas only. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 30' minimum.

245. Rosmarinus officinalis: Additional information may be required as directed by NBFD.

246. Salvia greggii: Additional information may be required as directed by NBFD.

247. Salvia sonomensis: May be used in the mid to upper "B" fuel modification zone. The plants may be planted in clusters of up to 3 plants per cluster. Mature spacing between individual plants or clusters shall be 15' minimum.

APPENDIX C

Conceptual Fuel Modification Plan

FIRE BEHAVIOR ANALYSIS:
SLOPE: 22%
MAX FLAME LENGTH: 37.1 ft.
SPREAD RATE: 2.45 mph

EXISTING EDGE
OF CSS HABITAT

EXISTING EDGE
OF CSS HABITAT

80 FT.

70 FT.

50 FT.

BLOCK RETAINING
WALL

FIRE BEHAVIOR ANALYSIS:
SLOPE: 25%
MAX FLAME LENGTH: 37.2 ft.
SPREAD RATE: 2.47 mph

EXISTING LANDSCAPE
EASEMENT

50 FT.

78 FT.

BLOCK RETAINING
WALL

TS-1

TS-2

TS-3

TS-4

TS-5

TS-6/Clubhouse

TS-7

EXISTING
BUILDING
TO REMAIN

1 inch equals 20 feet

FUEL MODIFICATION ZONE DESCRIPTIONS

Special Treatment Zone:
Environmentally sensitive area adjacent to coastal sage scrub habitat. Landscaping vegetation shall be limited to Carex grass species or ground cover only from the NBFD fire resistive plant list. Ground cover to be irrigated and maintained at a height of 8 inches or less and free of dead plant material. No shrubs or trees to be planted in this zone.

Zone A:
Defensible space zone located immediately adjacent to proposed structures. This zone shall include irrigated ground cover selected from the fire resistive plant list maintained at a height not to exceed 8 inches. Any shrubs or trees proposed for planting in this zone shall be in accordance with planting guidelines and spacing standards established in the NBFD Fuel Modification Standards. All combustible plant species shall be removed and the area shall be maintained free of dead and dying plant material. Maintenance shall include ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying fire resistant plantings, maintenance of the operations integrity, and programming of the irrigation system, regular trimming to prevent ladder fuels.

Zone B:
This zone lies within existing maintenance easement. No additional landscaping is anticipated for this area. Surface fuels shall be maintained at a height not to exceed 18 inches, grasses shall not exceed 8 inches in height. All non-native trees and shrubs shall be removed from this zone. Any proposed planting in this zone shall be in accordance with planting guidelines and spacing standards established in the NBFD Fuel Modification Standards. All undesirable plant species shall be removed and the area shall be maintained free of dead and dying plant material.

Zone C/D:
No additional landscaping is anticipated for this zone. Treatment of this zone shall include removal of all dead and dying vegetation. All fine fuels shall be reduced to a maximum of 8-12 inches in height. Trees and large tree-form shrubs which are being retained shall be pruned to provide clearance of three times the height of the under story plant material or 10 feet, whichever is higher. Dead and excessively twiggy growth shall also be removed. All existing plants or plant groupings except cacti, succulents, trees, and tree-form shrubs shall be separated by a distance of three times the height of the plant material or 20 feet, whichever is greater.

HYATT REGENCY NEWPORT BEACH

SUNSTONE HOTEL INVESTORS, INC.

CONCEPTUAL FUEL MODIFICATION PLAN

SEPTEMBER 28, 2007

DUDEK