

FIRE PROTECTION PLAN

And

CATASTROPHIC WILDFIRE RISK ANALYSIS

TPM 20975 RPL 2, ER# 0508028

SANTA FE HILL

Rancho Santa Fe, CA

July 18, 2007

FIRE MARSHAL
Rancho Santa Fe Fire Protection District
Post Office Box 410
Rancho Santa Fe CA 92087
(858) 756-5971

APPROVED
Date: 7-30-07
By: [Signature]
Fire Marshal

**OBTAIN FIRE AGENCY APPROVAL
PRIOR TO THE FOLLOWING INSPECTIONS:**
Underground Plumbing _____
Final _____
Other [Signature] _____
It is unlawful to make any changes or alterations on
this site plan and specifications.

Prepared by:

*Scott Franklin Consulting
Urban Wildland Fire Management
25059 Highspring Ave.
Santa Clarita, CA. 91321
Phone (661) 254-2376
Email: Scott@Fireconsult.net*

Approved: Ranch Santa Fe Fire Protection District

By: [Signature]
Fire Marshal, Clifford F. Hunter

Dated: 7-30-07

**SDC DPLU RCVD 12-13-07
TPM 20975 RPL2**

TABLE OF CONTENTS

1. INTRODUCTION	3
2. PRINCIPLES OF CHAPARRAL/COASTALSAGE MANAGEMENT....	4
3. FUEL – Arrangement, Loading and Chemical/Moisture Content.....	5
4. FUEL MANAGEMENT PRACTICES – Definitions.....	6
5. RISK OF WILDFIRE – A General Overview.....	6
6. RISK OF STRUCTURAL FIRE	6
7. MODELS	7
8. SANTA FE HILL FIRE/VEGETATION MANAGEMENT PLAN.....	8
9. INFRASTRUCTURE.....	10
10. SUMMARY.....	19
11. APPENDIX	
APPENDIX A	
Biological Resources Map	
Figure 1, Regional Location	
Figure 2, Coastal Sage Scrub, Trailside Road	
Figure 3, Looking South, Trailside Road	
Figure 4, Looking Southeast, Trailside Road	
Figure 5, Black Sage at Trailside Road	
APPENDIX B	
Residential Driveway Standard Approach	
APPENDIX C	
Fire Protection Plan	
APPENDIX D	
Olivenhain Municipal Water District Water Modeling Report	
APPENDIX E	
FRX Exterior Fire-Retardant Treated Wood Manufactures and Products	
APPENDIX F	
Typical Courtyard Tree Canopy Setback	
APPENDIX G	
San Diego County Fire Chief’s Association Fuel Modification Zone Plant List	

1. INTRODUCTION

Santa Fe Hill consists of approximately 10.21 acres of private land located in northern San Diego County. The area is within the San Dieguito Community/subregional Plan Area. The developer proposes to subdivide the project into four parcels of 2.5± acres. Fire protection is provided by Rancho Santa Fe Fire Protection District. The project area is within a designated High Hazard Fire Severity Zone. The area is subject to weather extremes in summer, fall and early winter months that have historically led to catastrophic wildfire episodes.

The summer fire threat comes with wind from the west or southwest, under a sub-tropical high-pressure system aloft. Elevated air temperatures (above 100°F) coupled with an on shore westerly wind in excess of 20 mph. The fall and winter, off shore, down slope Santa Ana wind episodes occur with precise regularity, commencing as early as mid September and lasting through March.

The down slope weather (Wx) situation occurs when there is a differential in pressure between the Great Basin (Eastern California, Nevada and Utah), and Southern or Baja California. When these conditions occur, leaf moisture is driven from grass, shrubs and trees and with low leaf moisture they become extremely fire prone.

CLOSEST FIRE STATION IS AT 16930 FOUR Gee Rd., 2.5 miles and 5.5 minutes driving time.

In discussions with Ranch Santa Fe Fire personnel (Mike Scott), two types of wildfire scenarios impact this area. The summer, very high air temperature events have occurred as well as the fall, offshore high wind Santa Ana events.

Vegetative cover found on the site is primarily Diegan coastal sage scrub and non native grass land. Vegetation found on the adjacent surrounding property consists of coastal sage scrub mixed with non native grassland. The area has been used for agricultural purposes and this has impacted native vegetation. This type of vegetation is extremely fire prone, due to its high fine fuel component.

BEHAVE (the Fire Behavior and Fuel Modeling System, including BEHAVE Plus 3.02 (2006) developed by research scientists from USDA-Forest Service (Andrews & Bevens 2003; Burgan & Rothermel 1984), will be employed to validate both wildfire risk as well as proposed Vegetation Management recommendations. The BEHAVE system provides an indication of how vegetative fuels will burn under specific fuel, weather and topography conditions. The BEHAVE system is a set of computer programs based upon energy release from specific fuels and is employed by wildfire professionals both nationally and internationally to predict wildfire behavior. Fuel Models used in BEHAVE have been classified into four groups based upon fuel loading (tons/acre), fuel height, and surface to volume ratio. The differences in fire behavior among these four models are basically related to fuel (tons/acre) and their distribution among fuel particle size classes. Observation of the location and positioning of fuels in the field (on-site) determines which fuel groups are represented. Selection of the appropriate fuel model may be

simplified if one recognizes those features that distinguish one fuel group from another, according to the following categories:

- Grasses - Fuel Models 1 through 3
- Brush - Fuel Models 4 through 7
- Timber- Fuel Models 8 through 10
- Logging Slash – Fuel Models 11 through 13

In 2004 and 2006, 45 additional fuel models were added –BEHAVE 3.02

2. PRINCIPLES OF CHAPARRAL/COASTAL SAGE MANAGEMENT

To better understand the principles of vegetation management in the chaparral community, a brief discussion regarding vegetation/fuels is appropriate. All vegetation is considered “fuel”; no “fire proof” vegetation exists. All vegetation will burn, but some require more heat in order to ignite and propagate flame.

One such example is dry grass versus green grass. Dry grass will ignite immediately, while green grass must lose its moisture before it will ignite. Chaparral with high oil content (above 6%) will burn quicker and hotter than chaparral with a high leaf moisture and low oil content. More than 90% of the flaming front of a wildfire is composed of fuel less than one-half inch in diameter, and is consumed in minutes. Small branches and leaves make up this type of fuel. Fuels larger than one inch in diameter are termed “residual” fuels and may require several hours to burn out. This larger fuel does not contribute to the forward rate of spread of the fire.

Oil and moisture content varies between fuels, depending upon the time of year. For example, Black Sage (*salvia mellifera*) may have an oil content approaching 20% of its weight, but in the spring, it has moisture content over 300%. By summer, the moisture content may be lower than 60%. Manzanita (*Arctostaphylos sp.*) oil content is about 15% and moisture varies between 120% and 50%. Scrub oak (*Quercus dumosa*) has oil content below 4% and moisture content above 100%. *Ceanothus sp.* has low oil content, with *C. spinosis sp.* retaining moisture at 100% or higher. When stressed during extreme dry periods, *Adenostoma sp.*, *Arctostaphylos sp.*, and *Artemesia sp.* will react explosively when moisture falls below 60%. Conversely, *C. spinosis* and *Q. Dumosa* require high energy to sustain ignition.

There are two types of fuel moisture to consider, dead fuel moisture (with a 1 hour time lag, 10 hour time lag, 100 hour time lag and 1000 hour time lag) and live fuel moisture. Temperature, aspect, time of day, relative humidity and month of the year are all factors that determine the percentage of dead fuel moisture. One-hour time lag fuel is less than ½ inch thick; 10 hour fuel is between ½ inch and 1 inch thick; 100 hour is between 1 inch and 3 inches; 1000 hour fuel is above 3 inches in thickness. One-hour time lag fuel can reach equilibrium with the surrounding atmosphere in one hour, and within minutes when air temperature is high (above 80° F), and relative humidity is below 25%. One-hour fuel moisture may be calculated using a set of tables that reference time of day, month, aspect,

slope, temperature and relative humidity. 10-hour time lag fuel can take up to 10 hours to reach equilibrium; 100-hour and 1000-hour fuels follow the same pattern. In southern California, 1one-hour, 10-hour and 100-hour time lag fuels are usually given equal value. 1000-hour time lag fuel, which happens to be timber, is used in measuring drought effects. Forests are considered ‘critical’ when 1000-hour fuel measures less than 15%. (Kiln dried wood is 22%). Live fuel moisture is the moisture found in the leaf and woody portion of a shrub. Live fuel moisture is calculated by first cutting a small branch (less than 3”), then weighing the branch and placing it in a low temperature oven for 12 hours; then, removing the branch and weighing it again. The difference in weight equals the loss of moisture in the leaves and woody portion of the branch. For this reason, live moisture may exceed 100% of the dry weight of the plant. Live fuel moisture is highest in the spring and early summer, and lowest in late summer, fall and early winter.

3. FUEL – Arrangement, Loading, and Chemical/Moisture Content

Measuring the force of wildfire is accomplished by observing flame lengths produced by burning vegetation. There exists a direct relationship between the amount of energy released, per second, and the length of flame generated. The United States standard for measuring energy released per second is the British thermal unit or “Btu”.

One Btu is the amount of energy required to raise one pound of water one degree Fahrenheit. A single kitchen match or single candle flame equals one Btu. A cup of gasoline contains about 8,500 Btu’s. Comparably, a pound of chaparral contains 8,500 to 10,000 Btu’s, depending upon oil content (ether extractives).

Ignite gasoline in a cup and it will burn evenly. Spread the cup of gasoline across the floor and it will burn rapidly, if not explosively. Similarly, if you aerate a pound of chaparral, as occurs naturally, raise the surrounding temperature to 100°F, and then pass a 30 mph wind through it while igniting, the chaparral will burn almost as explosively as the cup of gasoline spread across the floor.

Grind, cut or chip chaparral into pieces less than 3” long, place on the ground as “mulch” and attempt to ignite it; the chaparral will burn very slowly or only smolder. This demonstration suggests that fuel arrangement and fuel chemical/moisture content play an equally important role in wildfire combustion. Moisture in the form of high leaf and woody fuel moisture, high relative humidity (Rh above 50%), is significant because it requires energy to dry out the fuel in order for it to burn. High winds and or high temperatures remove moisture, allowing the shrub to burn more rapidly. Lower fuel moisture, both dead and live, equal higher fire intensity. Wetter fuel inhibits complete combustion as well as producing excessive smoke. Live vegetation in its natural state exhibits a high surface to volume ratio. Standing grass and standing chaparral have a high surface to volume ratio. Forest litter on the ground (leaves & small twigs) and chipped or cut biomass exhibit a very low surface to volume ratio.

Chaparral, particularly *salvia sp*, is found in most vegetative communities (excluding riparian) and has an oil content of 15 to 19%. Riparian vegetation, including Sycamore

(*Plantus racemosa*), Coastal live oak (*Quercus sp.*), green bark Ceanothus (*C. spinosis*), and Mulefat (*Baccharis sp*) are considered wet or high leaf moisture vegetation. This high leaf moisture acts as an energy sink, requiring higher Btu output to ignite or sustain ignition.

4. FUEL MANAGEMENT PRACTICES – Definitions

Terms used to describe various activities or actions regarding fuel management often times are misused or misstated. The following terms regarding fuel management practices are recognized as the standard for the fire service:

CDF – California Department of Forestry and Fire Protection, also known as CalFIRE
Defensible Space – area with low fuel volume that affords protection for fire personnel as well as residents.

DPLU – County of San Diego Department of Planning and Land Use

Fireline – a narrow line, 2' to 10' feet wide, from which all vegetation is removed.

Firebreak – specifically a Fireline wider than 10' feet, prepared annually.

Firelane – an access line, prepared either ahead of the fire or in advance of fire season, forming the basis for a firebreak.

Fire Control Line – strip cleared to mineral soil.

Fuelbreak – a strategically located wide block, or strip, on which vegetative cover has been reduced to lower or alter fuel volume.

Fuelbreak System – a system of relatively large open areas, interconnected by fuel breaks.

Fuel Modification Practice – the broad approach to fuel management on large area of wildland, or a limited approach to fuel management around structures.

Hardening of Structures – application of fire resistive rating to a structure.

Moisture of Extinction (MOE)-Moisture level, in percent, that fuel will cease to burn.

Prescribed Burning – Application of fire to wildland fuels when conditions such as weather, fuels and topography permit a specific objective to be accomplished.

Red Flag Alert – extreme fire weather condition issued by the National Weather Service when wind speed exceeds 25 mph and relative humidity falls below 15%.

Residency Time – Time the flaming front of a wildfire impacts a specific area.

Shelter in Place- area for residents or fire personnel to safely survive catastrophic wildfire.

5. RISK OF WILDFIRE – A General Overview

Continuous vegetative cover both within and surrounding the project area contributes to the risk of catastrophic wildfire.

6. RISK OF STRUCTURAL FIRE

Since there presently exists no structures on the property, no threat exists. Appropriate minimum vegetation management requirements, coupled with stringent structural safe guards, will provide for a wildfire safe development

7. MODELS

The following weather and fuel inputs have been provided to create a “worst case” wildfire scenario. These Models are used to replicate the amount of flame propagation that would exist under extreme or catastrophic wild fire weather conditions. While weather conditions play a major role in wildfire behavior, fuel conditions and topography are also a part of the equation. BEHAVE calculations assume there is no fire suppression activity.

The project area is predominantly covered by disturbed grass and coastal sage scrub. The highest number of Santa Ana wind episodes, as well as days of duration, occurs during the month of November, while the month of August has the least number.

Two fire models are employed, which are representative of the on-site vegetation. The fuel Models are:

1. Gs2 Grass, low load, dry climate grass, 1 ton/acre, 1’ in depth, 8,000 Btu/lb.
2. Sh5 Shrub, high load, dry climate shrub, 8.5 tons/acre, 6’ in depth, 8,000 Btu/lb (Coastal sage scrub).

Gs2 is found in re-vegetated areas intermixed n disturbed coastal sage areas.

Two fuel model/fire weather scenarios are employed to reflect catastrophic wildfire. The first scenario is summer, with high air temperature; the second is a fall/winter scenario with lower air temperature, high wind speed.

Source of weather (Wx) Data: RAWs Station, Ammo Dump, Target Range @ Camp Pendleton

INPUTS:

Fuel Model gr2, sh5	
Summer Fire	Fall-Winter Fire
1 hr. fuel moisture 2%	1 hr fuel moisture: 2%
Live fuel Moisture; 70%	Live fuel moisture: 55%
20-ft wind speed: 20 mph	20-ft wind speed: 25 mph
Slope: 50%	Slope: 50%
Air temperature: 103°F	88°F

OUTPUTS:

Fuel Model gr 2	
Summer Fire	Fall-Winter Fire
Rate of Spread: 69 ch/hr or 0.9 mph	Rate of Spread: 240 ch/hr or 3 mph
Flame length: 6.7 ft	Flame length: 12.3 ft
Spot dist: 0.3 miles	Spot dist: 1.0 miles
Probability of Ignition: 100%	Probability of Ignition: 100%

Fuel Model sh5	
Summer Fire	Winter Fire
Rate of Spread: 237 ch/hr or 3 mph	Rate of Spread: 565 ch/hr or 7.0 mph
Flame length: 29 ft	Flame length: 44.0 ft
Spot dist: 1.0 miles	Spot dist: 2.1 miles
Probability of Ignition: 100%	Probability of Ignition: 100%

Weather conditions vary from month to month, as does live fuel moisture, sun angle (including amount of daylight) and air temperature. Air temperature may moderate during fall and early winter, but live fuel moisture may continue to drop through January or early February. If any ground moisture is present, live fuel moisture will start rising in March and will peak in late May or early June depending upon annual rainfall, air temperature and cloud cover. BEHAVE inputs include latitude and longitude for site specific forecasting.

Note the difference in flame lengths between summer and fall. This is the result of high wind and lower live and dead fuel moisture in the fall model.

8. SANTE FE HILL FIRE/VEGETATION MANAGEMENT PLAN

Specific Fire Zone Requirements

Landscape plan shall be submitted to the Fire District for review. Submittal shall comply with criteria identified in Ordinance #03-01, Appendix II-A. Landscape plans are required to meet Fire District Standards and shall be approved prior to framing inspection. Landscape notice must be signed. Landscaping and fuel modifications shall be installed before final to insure a fire safe environment.

Besides receiving a copy of this Fire Protection Plan, every homeowner shall receive a lot exhibit showing fuel modification zone and structure setback requirements as part of the sales packet.

1. All non-native trees including conifers, pepper trees, eucalyptus and acacia species, shall be planted and maintained so that the tree drip line at maturity is a minimum of 30' from any combustible structure. All fire resistive tree species shall be planted and maintained at a minimum of 10' from the trees drip line to any combustible structure.
2. For streetcape plantings, all non-fire resistive trees shall be planted so that the center of the tree trunk is 20' from edge of curb. Fire resistive trees can be planted 10' from edge of curb to center of tree trunk. Care should be given to type of tree selected that will not encroach into the roadway, nor produce a closed canopy effect.
3. Limit planting of unbroken masses, especially trees and large shrubs. Groups should be two to three trees maximum, with mature foliage of any group separated horizontally by at least 10', if planted on less than a 20% slope, and 20' if, if planted on greater than a 20% slope.

4. If shrubs are located underneath a trees drip line, the lowest branch should be at least three times as high as the understory shrubs or 10', whichever is greater.
5. Existing trees shall be pruned 10' away from roof, eave, or exterior siding, depending upon the trees physical or flammable characteristics and the building construction features.
6. All tree branches and palm fronds shall be removed within 10' of a fireplace chimney or out door barbecue.
7. All landscaping shall be installed prior to final inspection.

With the above exceptions, all lots that abut open space areas require a 100' MINIMUM fuel modification zone.

BEHAVE 3.02 has indicated, worst case, 44' flame lengths. Therefore a 100' Fuel Modification zone meets the minimum requirements. The impact of non-enforcement will cause the developer to loose a lot, resulting in a significant impact. Therefore, it is highly beneficial to the Fire District as well as the developer to insure annual compliance.

A single Home Owners Association (HOA), funded by the residents, will be required to comply with the following requirements and retain a consultant approved by the Rancho Santa Fe Fire Marshall. The HOA will also be required to report to the Rancho Santa Fe Fire Marshall by May 1st of each year, stating that Santa Fe Hills is in compliance with this plan:

- Maintain all fuel modification zones per this plan, unless modified by the Rancho Santa Fe Fire Marshall.
- All trees shall be limbed up so as to provide 13'6" clearance above the road for emergency vehicle access.
- All access roads to maintain 30 feet fuel modification on improved widths of 16 feet, 30 feet on improved widths of 24 feet, 30 feet on improved widths of 28 feet and 30 feet on improved widths of 32 feet on each side of low fuel volume (less than 6") ground cover.

It makes little sense to require brush clearance for wildfire safety, if the property owner then introduces shrubs and trees that can readily transmit fire throughout the area.

The following shrubs and trees are highly flammable; some are not drought tolerant and therefore shall not be planted within the project area:

Salvia Spp

Pampas grass –*Cortaderia spp.*

Cypress - *Cupressus spp.*

Eucalyptus –*Eucalyptus spp.*

Juniper – *Juniperus spp.*

Pine – *Pinus spp.*

Cedar-*Cedrus spp.*

Eriogonum fasciculatum

Artemisia californica

Salvia apiana

Salvia columbariae

The following shrubs and trees are an example of those recommended for general landscaping - with appropriate maintenance:

Coastal live oak - *Quercus spp.*
California Sycamore – *Plantus racemosa*
Cottonwood – *populus fremontii*
Willow – *Salix spp.*
Mule Fat – *Baccharis viminea*
California Bay – *Umbellularia californica*
California Black Walnut – *Juglans californica*
Liquidamber – *Liquidamber styraciflua*
Ceanothus spp.
Toyon – *Heteromeles arbutifolias*
Mountain Mahogany – *Cercocarpus betuloides*
Holly leaf cherry – *P. ilicifolia*
Dwarf periwinkle – *Vinca minor*
Grass – *Stipa spp.*

NOTE: Unless noted, all perimeter and/or open space lots require a 100 ft fuel modification zone.

Zone A: From structures out 50 feet. Must be irrigated. Lawn or low-lying plants (less than 3 inches) are recommended as ground cover. Area beneath oak trees (unless newly introduced), to canopy drip line need not be irrigated. Shrubs on 10’ centers, less than 2’. Newly planted trees may be irrigated at the base of the tree.

Zone B: From 51’ to 100’. May be irrigated, but not required. Ground cover less than 4 inches, shrubs less than 3 feet, on 10’ foot centers. No restrictions on oak or sycamore trees, except height clearance (13’6”) above drive ways and roads.

All Roads and driveways must provide 30’ feet of clearance, or irrigated landscaping, each side. This clearance must meet Zone requirements, with trees set back so canopy is kept 13’6” feet above road bed in order to allow fire equipment access. Irrigation may be discontinued after 3 years.

If any type of wood fencing is chosen for corrals/wildland/open space areas, it shall be of heavy timber (minimum 4” X 6”) nominal lumber size, or non-combustible materials and set back five feet from the wild land/open space area with placement of chipped biomass, rock, and gravel or bare ground for five feet each side of the fence.

In all planted areas outside of the “wet” zones, the uniform spacing of shrubs may be modified by clustering of smaller shrubs thus creating drifts of them, as long as such clustering does not result in an average spacing of less than 15’ feet on center.

9. INFRASTRUCTURE

A. BUILDING IGNITION AND ENHANCED FIRE RESISTIVE CONSTRUCTION:

All building materials and components shall comply with DPLU County Building Code Enhanced Fire-Resistive Construction standards and Rancho Santa Fe Fire Protection District ordinances. All structural setbacks shall comply with Rancho Santa Fe Fire Protection District requirements and have the objective of preventing direct flame contact on a structure from a fire burning up a slope. A minimum 30' setback is recommended.

1. All residential and non-residential structures, including barns, RV garages, or accessory buildings over 200 sq feet in size, shall have internal fire sprinkler systems designed to NFPA and Rancho Santa Fe requirements. Single-family residential systems shall be National Fire Protection Association (NFPA) standard 13-D, and including garages and enclosed patios or porches. Systems in occupancies other than strictly residential shall be NFPA 13 property protection systems. Auxiliary structures including palapas, cabanas, trellises, and Jungle Jim play ground equipment must be approved by the fire Marshal.
2. Actual sprinkler system design and installation to be to the approval of the Rancho Santa Fe Fire Marshal.
3. Roof systems shall be listed or Fire Marshal approved Class A assemblies installed in accordance with the listing and manufacturer's installation instructions. The end of any Spanish tile roofs, or other high profile roofs, shall be blocked to prevent bird's nests and intrusion of burning embers. Where the roof profile allows a space between roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames or embers. All roof edges and valleys to be made tight so there are no gaps. Roofing construction shall comply with State Fire Code, Article 86-B, Section 8604 B.1, Emergency Supplement; 5-30-06, and Chapter 7-A of the State Building Code; Emergency Supplement dated 6-21-06.
4. Roof Valleys: When provided, valley flashings shall be not less than 0.016 inch (no. 28 galvanized sheet metal), corrosion resistant metal installed over a minimum of 36" wide underlayment consisting of one layer of No. 72 ASTM cap sheet running the full length of the valley. (CBC Chapter 7-A, Emergency supplement 6-21-06)
5. Exterior walls, and unenclosed under floor protection, on all structures to be either one-hour rated stucco assembly, approved one-hour rated walls on exterior side, approved non combustible, or other approved ignition resistant construction. No combustible wall coverings. Walls to comply with Rancho Santa Fe Fire Code. Wood shingle and shake wall coverings are prohibited. Heavy timber construction (minimum 4" X 6" nominal timber size), FRX exterior fire treated wood is acceptable.

In all construction, exterior walls will be protected with 2-inch nominal solid blocking between rafters at all roof overhangs under the exterior wall covering.

6. Eaves shall be detailed and constructed in accordance with current Rancho Santa Fe Codes. Eave vents are not allowed.
7. Vent openings or vent louvers in eaves, eave overhangs, cornices, soffits, rakes, between rafters at eaves, or in other similar overhang areas are not allowed. If allowed by Rancho Santa Fe Fire Marshal, they shall be detailed and constructed to prevent flame or ember penetration into the structure and to the satisfaction of the Fire Marshal.
8. All attic and foundation vents shall be properly designed to prevent flame or ember penetration into the structure, with Fire Marshal approved mesh size and material. Louvers and approved ¼" mesh are required by code. The Architects and the Building official shall investigate use of 3/16" or 1/8" corrosion resistant metal mesh and baffled vent systems, based on indications from recent fires regarding apparent entrance of burning debris into ventilated spaces through ¼" mesh vents. A baffle system shall be created and approved for installation behind vents to catch burning debris and sparks, while allowing adequate ventilation. Vents shall be designed to prevent flame or ember penetration into structure.
9. Any vent assemblies on roofs to be of an approved type. No turbines allowed.
10. There shall be no paper-faced insulation, or combustible insulation, in attics or other ventilated spaces.
11. Glazing facing wildland areas shall be minimized. Glazing in structures shall be tempered, double pane, glass block or have a 20 minute fire rating. Glazing on facing structures with less than 10' between them shall be tempered glass or double pane.
12. Any plastic or vinyl window frames shall comply with the following:
 - Frame and sash are comprised of vinyl materials with welded corners.
 - Metal reinforcements in the interlock area.
 - Glazed with insulated glass or tempered.
 - Frame and sash profiles are certified in AAMA lineal certification program (verified with either an AAMA product label or certified products directory).
 - Certified and labeled in accordance with ANSI or other approved agency standard.
 - Comply with ANSI/AAMA/NWWDA 101/I.S 2-97 structural requirements, as required by County Fire Code.
13. Any skylights shall be tempered.

14. Except for windows and sliding glass patio doors, there shall be no plastic or vinyl on exteriors of structures.
15. Gutter and downspouts to be non-combustible. There shall be no plastic gutters or downspouts. Gutters shall be designed to prevent build up of debris, leaves, etc.
16. Doors on structures shall be metal, approved non-combustible, or solid core heavy wood with minimum 1¾" thick, or have a 20-minute fire rating. (ref. CBC Chapter 7-A Emergency Supplement 6-21-06). Any fiberglass doors shall be to approval of the Rancho Santa Fe Fire Marshal and the Building official. Fiberglass doors on structures to have 20 minute fire rating. Doors on garages to be metal. Wood garage doors may be proposed for use, but only if fire-rated to the satisfaction of the Fire Marshal. Glazing in doors shall comply with glazing requirements in item 11 in this section.
17. Structures to be enclosed from underside of roof to ground. No open crawl spaces or open raised floor cavities.
18. Structures to have approved garden hose connections on all sides of structures.
19. Approved spark arrestors to be on all chimneys, stovepipes and flues. Arrestors to be visible from grade.
20. No hay, firewood, lumber, LPG tanks (except small tank on barbeque), etc, within 30' of residential structures or garages.
21. LPG tanks shall be properly anchored to ground to resist earthquake, or movement due to a fire or heavy rain. LPG tanks shall not have any flammable vegetation under or around tank for 30'.

B. AUXILIARY STRUCTURES: PAVILIONS, TRELLISES, ARBORS, PERGOLAS, CABANAS, PALAPAS, AND PLAYGROUND EQUIPMENT

Auxiliary structures are evaluated for a fire event (i.e., type of combustible materials, size of structure, distance from house and intended use). In addition, if structure is more than 50% covered, a Class A noncombustible roof is required.

ATTACHED, AUXILIARY STRUCTURE TO HOME: IE, Overhead doors and decking not enclosed on three sides.

1. 100-foot Fuel Modification Zone extends from attached structure perimeter.
2. Maximize use of non-combustible material. Columns must be non-combustible masonry and/or stucco or pre-cast concrete.
3. Nominal timber size (4" X 6") for fire resistive construction is required.
4. Attached structure may not extend into predetermined setbacks.

5. Any covered area shall be required to be protected with fire sprinkler system when the dimension from the wall of the structure to the edge of the covered area exceeds ten feet.

DETACHED, AUXILIARY STRUCTURES LESS THAN 250 SQUARE FEET; i.e., small playground equipment, gazebos, shed, trellis, palapas AND ARBOR.

1. When structure is 250 square feet or less, the 100' fuel modification zone extends from the house outwards, not the auxiliary structure.
2. The structures shall be a minimum of 20' from other combustible structures.
3. Maximize use of non-combustible material. Columns to be non-combustible masonry and or stucco or pre-cast concrete.
4. Nominal timber size (4" X 6") for fire resistive construction required.
5. Structure may not extend into the fuel modification setbacks from top of slope.
6. The canvas awnings for playground equipment shall be identified and maintained annually, as fire retardant.
7. Structure encloses on 3 or more side may require an automatic fire sprinkler system.
8. All palapas with thatched roof shall be at a minimum of 30' from any combustible structure. Roofing material shall be applied with a fire retardant chemical. Proof of application and UL rating of fire retardant chemical shall be provided to the Fire District prior to installation of palapas.

DETACHED AUXILIARY STRUCTURES GREATER THAN 250 SQUARE FEET: i.e., (large playground equipment, guesthouse, cabana, palapas, and pool house)

1. When auxiliary structure is 250 square feet or greater, the fuel modification zone extends from the auxiliary structure.
2. The structures shall be a minimum of 30' from other combustible structures, unless other wise permissible by local zoning requirements.
3. Maximize use of non-combustible material, Columns must be non-combustible, masonry and/or stucco or pre-cast concrete.
4. Nominal timber (4" X 6") for fire resistive construction required.
5. Structures may not extend into fuel modification set backs fro top of slope.
6. The canvas awnings shall be identified and maintained annually, as fire retardant.
7. Structures enclosed on three or more sides may require an automatic fire sprinkler system.

C. DECKS, FENCES, ADDRESSES:

1. Decks, porch covers, balconies, carports patio covers, gazebos, palapas, large jungle gyms, similar architectural appendages, unenclosed floors and roofs, and any projections from structures, will be approved non-combustible, approved fire retardant pressure-treated wood, one hour fire rated or heavy timber. The underside will be enclosed on all sides, or be heavy timber. When such appendages are attached to exterior walls, they will be constructed to maintain the fire resistive integrity of the wall. There will be no plastic or composite decks or railings, which can melt in fire conditions or contribute to fire spread (unless approved

by Rancho Santa Fe Fire Marshall). All decking, patios and gazebos, shall comply with county of San Diego DPLU Consolidated Fire Code, as amended.

2. Fences within 100' of structures shall be heavy timber (4" X 6"), block or steel. No wood allowed within 5' of structure, other than a wood gate and it's supporting post. In this case, there shall be non-combustible material for 5' to the fence to provide a fire break. Property line fencing along the perimeter shall be solid block, masonry, steel, or heavy timber. Any wood fencing for multi-use trail along the perimeter and in the interior of the project will be heavy timber. Heavy timber split rail or heavy timber fences can be used outside of the fuel modification zones as well as along the equestrian trails. No fencing or railings will be plastic or vinyl of a type, which can ignite and burn. This includes areas along roads and trails.

3. Structure addresses:

Structures will have reflective, visible, legible, street addresses; 4" high numbers with 3/8" stroke for residential; 6" numbers with 1/2" stroke for other occupancies. Characters will contrast with their background. Addresses to also be posted at the road entrance to driveways. Addresses will be visible/legible from the roadway from either direction of approach. Addresses shall not be posted on wooden posts.

D. ACCESS ROADS AND FIREFIGHTER WALKWAYS:

Access to the site is off Artisan Tr. Roads shall be all weather, 24' wide with vertical clearance in excess of 13'6".

All on site and offsite access roads must comply with San Diego County Fire Code Section 902.2. Access roads will be provided when the any portion of the exterior wall of the first floor of any structure is beyond 150' from the closest approved, 24' wide unobstructed. Fire Department vehicle access road, as measured by an approved route around exterior of the building. Roads must support a 50,000-pound fire apparatus. This includes all residences and other occupancies.

All roads, and any cul-de-sac bulbs or hammerheads, shall be paved, all weather, and meet Rancho Santa Fe requirements for fire access.

The required road widths of all roads will be a minimum of 24' unobstructed, paved, width (unobstructed by parking) and will have unobstructed vertical clearance, and be of a paved surface capable of supporting a 25-ton fire truck. Parking shall be assumed to be 8' in width due to the potential presence of dual tired trucks,

All Roads shall be posted "No Parking Fire Lane" where necessary to assure 24' width unobstructed by parking. 24' wide improved roads are designated fire lanes for the entire road width and shall be posted as such. 32' wide improved roads are designated as fire lanes with parking allowed only on one side; they shall also be posted as such. Cul-de-sac bulbs are to be posted "No Parking-Fire Lane" prohibiting parking anywhere in cul-de-sac bulb.

Phasing of the project must be approved by the Ranch Santa Fe Fire Marshal. Each phase or unit must meet all Fire Code requirements including road width, grade, paving, posting, street signs, lack of obstructions, and must also include the needed fuel modification.

There shall be no overhanging tree canopies under 13'6" high on roads. There shall be no portions of trees intruding on width of access road. There shall be no road grades over 15%. Angle of departure and approach to be approved by the Fire Marshal. Turning radius to be 28' measured from inside edge of improved width.

The current legal access to the property is a private easement from artesian Rd. and Artesian Trail. The proposed access roads will be all weather roads, capable of holding 50,000 pounds, with width of 24' and unobstructed vertical clearance of not less than 13 feet 6 inches. Individual driveways shall be tapered 36' wide, Fire access road and drive ways shall not exceed 20% gradient and gradients exceeding 15% shall not be permitted without mitigation.

Minimum mitigation shall be installation of a surface of Portland cement concrete, with heavy broom finish, perpendicular to the direction of travel. Angle of departure and approach shall not exceed 12% or as approved by the Fire Chief. Turn around is required for driveways over 150. The first layer of asphalt and temporary address identification must be in place and serviceable prior to delivery of combustible construction materials. The HOA formed and funded by the four property owners, is responsible for all maintenance of access roads, signs and compliance with fire codes. The HOA is irrevocable and cannot be unfunded. The responsibility to participate conveys with property transfer. Failure to maintain road and fire regulation compliance subjects the property owners to potential fines, forced abatement, with charges, including administrative fees, leaned against the property.

Driveways will be provided if structure is 150' beyond the Fire Department access road (the on site roads). Residential driveways, serving no more than two single-family dwellings, to be 16' wide by 13'6" high unobstructed and be to Rancho Santa Fe approval as to length and grade. Entrance to driveways shall be tapered to 36' wide. Maximum driveway grade will be 15%, unless mitigated to approval of the Fire Marshal. Mitigation can include concrete driveway with heavy broomed finish perpendicular to direction of travel, for traction. (20% max). Driveways exceeding 150' in length shall have an approved turnaround at house. It shall be posted "No Parking Fire Lane". Turning radius to be 28' inside radius and 45' outside radius.

Access roads serving more than 2 structures shall be 24' wide unobstructed, have vertical clearance clear to sky, and have cul-de-sac turnarounds (bulbs) if road exceeds 150'. Bulbs and hammerheads will post "No Parking-Fire Lane" signs. Cul-de-sac bulb to have 36' radius (72' diameter).

Any traffic calming devices, raised planters or median strips will be to Rancho Santa Fe Fire Marshal approval. Speed bumps are not permitted. There will be no trees or other plantings within the unobstructed width of access roads.

Any gates, including automatic gates, will comply with the San Diego County Fire Code Section 902.2.4.3 Any gates that are within the Rancho Santa Fe Fire Protection District must meet the District's gate requirements. Public roads may not be gated. These are private roads and the main entrance roads will be gated. Gates on the main roads shall comply with community gate requirements. It is recommended, however, that all gates including those on private lots comply with the following:

- Gate to be automatic and open entire width of roadway (minimum 24' on main roads; 16' minimum on private driveways). Main entrance gate may have two separate lanes of travel, each of which must be at least 16' wide.
- Gate shall be at least 30' in from any intersecting road (consultant recommendation)
- Vertical clearance at least 13'6".
- Battery back up for primary power failure.
- Emergency vehicle strobe light (Opticom) detectors for all directions of approach, which opens the gate and holds it open for at least 1 minute OR strobe detection in the directions of approach and automatic opening in egress direction with exit loop.
- KNOX brand key switches that override all functions and open the gate. This is to be keyed to first in emergency fire agency responders and law enforcement
- Gates to be openable manually from either side and have a traffic loop on egress side (consultant recommendation).
- Gate to be posted "No Parking -Fire Lane".
- Consultant recommends that gates have a mechanism that will open upon sounding of a siren.

Detailed plans shall be submitted to the Rancho Santa Fe Fire Marshal, and to the Rancho Santa Fe Fire Protection District, if applicable, for approval. There shall be a responsible party identified for gate maintenance and repair.

Provide 4' wide firefighter foot access around all structures. Provide locations for spotting of Fire Department ground ladders on multiple storied structures. There shall be no trees or landscape, other than groundcover, which could prohibit Fire Department from gaining access and spotting ladders.

Streets will be named and have street signs at entrance to tract and at each intersection, listing the hundred block, meet DPW DS#13 standards and have reflective

letters/numbers, and be non combustible (non wood/non plastic) on non combustible (non wood/ non plastic) posts.

Fire Truck access points will be provided for direct access to wildland areas and open spaces abutting developed areas. These access points may be intermittent 12' wide access points from various roads within the development which directly adjoin the vegetation, or may be all weather 12' wide, non paved, roads which provide access to perimeter wildland areas. Access points shall be located to the approval of the Rancho Santa Fe Fire Marshal.

Roads leading to a structure from the existing main road shall be completed and usable prior to any construction on the lot.

E. WATER SUPPLY AND FIRE FLOW:

The Olivenhain Water District will serve this development. The required fire flow is 2500 GPM at 20 PSI for 2 hours in the water mains. This must be provided, even at times of peak domestic demand. The water system will be gravity feed water system, which shall not be dependent on pumps to provide the fire flow. Minimum main size will be 8" diameter. The system shall be a looped system with supply coming from two directions. Adequate valving must be provided so that large sections of the system do not have to be shut down to make repairs on a valve or pipe. Hydrants shall have individual lateral valves. The system design shall comply with AWWA Standard M-31, "Distribution System Requirements for Fire Protection".

The water system must be designed to also supply the required fire sprinkler systems. Any potential for excessive static pressure at fire hydrants or sprinkler systems must be properly controlled by a properly engineered water system with pressure reducing stations, etc, as needed. Actual proposed static and residual pressures to be to approval of the Fire Marshal.

Fire hydrant spacing shall be at approximate 500' intervals. Hydrants shall be located at each intersection and at the entrance to any cul-de-sac bulb, prior to the bulb. Hydrants shall be located on the normal response side of the road coming from the main entrances. Fire hydrants shall meet the requirements of the water purveyor and shall have one 4" and two 2.5" gated outlets. Protection against freezing (dry barrel hydrant) shall be provided if deemed necessary by the water district. Hydrants shall have a 3' by 3' concrete pad at the base (gravel if hydrants are required to be dry barrel due to freezing) for weed control. There must be no obstructions within 3' radius of any hydrant. Reflective blue markers in the road shall identify hydrant locations.

Fire Sprinklers:

All residences are to have fire sprinklers. The sprinkler system shall be an NFPA 13-D system. (coverage shall include all attached garages (within 10' of main structure) and enclosed porches. Out buildings, barns, recreational vehicle garages, etc, and other

structures over 200 square feet shall also be sprinkled, with exceptions per RSFFPD Ordinance No. 03-01.

The actual design of the fire sprinkler systems, and their water supply, shall be by an approved Fire Protection Engineer, certified for approval by the Fire Marshal. A licensed fire sprinkler contractor shall complete installation of the system.

F. FIRE PROTECTION SYSTEMS AND EQUIPMENT:

Explanatory Note: All fire extinguishing systems shall be installed per San Diego County Consolidated Fire Code and NFPA standards, and approved by the Rancho Santa Fe Fire Marshal.

All residential and non-residential structures, barns, and accessory buildings, over 200 square feet in size, shall have internal fire sprinkler systems designed to NFPA and DPLU requirements. Single-family residential systems shall be National Fire Protection Association (NFPA) standard 13-D with coverage to meet the requirements of the Rancho Santa Fe Fire Marshal, including garages, barns, and enclosed patios or porches. Buildings with uses other than residential shall RSFFPD ordinance No. 03-01 requirements. .

Actual sprinkler system, and water supply, design and installation to be to approval of the Rancho Santa Fe Fire Marshal; systems to have freeze protection, if needed.

Such inspections shall be funded by the homeowner. The HOA shall provide training and information to homeowners as to the maintenance of the sprinkler systems, the control valves, etc. All residential units shall have smoke detectors.

G. EMERGENCY PLAN AND REPORTING OF EMERGENCIES:

An Emergency Plan shall be prepared and issued to all residents of the development. This plan shall include procedures and guidelines for protective actions to take in the event of an emergency and shall be approved by the Rancho Santa Fe Fire Marshal prior to distribution.

H. REQUIREMENTS DURING CONSTRUCTION

1. Builder shall provide a minimum of 50' of clearance around the structures during construction. The area is to be kept free of all flammable vegetation.
2. Builder to maintain an all weather access road to construction site, minimum 15' in width, less than 15% grade, during construction phase.

10. SUMMARY:

This Plan encompasses the latest Rancho Santa Fe Fire Code requirements.

All buyers and occupants of property in this development will be put on notice that this project is within a high fire hazard area. All buyers shall also be given a list of the

recommendations and requirements found in this report, as well as plot plan showing fuel modification zones as well as structure set back requirements, and shall sign an acknowledgment agreeing to comply with all fire safety requirements for this development.

This development will comply with all applicable requirements of the San Diego County Fire and Building Codes, and requirements of the Rancho Santa Fe Fire Protection District. The recommendations in this plan, when approved by the Rancho Santa Fe Fire Marshal and other applicable agencies, shall be included in the CC and R's for every lot and will be a deed encumbrance or other legal document, which follows with the property sale.

During construction, a minimum of 50' of defensible space is required around the structure, and is to be kept free of all flammable material.

As fire is dynamic and unpredictable, this plan does not guarantee that a fire won't occur or won't cause property damage, injury or loss of life. No expressed or implied guarantees are made regarding the adequacy or effectiveness of the recommendations and requirements in this plan for all situations.

Review of all specifics regarding architecture, landscape architecture, engineering, and construction are out of the scope of this Fire Protection Plan. All architectural, landscape architecture and engineering design and official plan approvals must be obtained from the authorities having jurisdiction including the Rancho Santa Fe Fire Marshal. In the event there is a practical difficulty, legal environmental constraint or other legal constraints, or engineering/architectural difficulties in complying with this plan, alternative methods of compliance may be submitted to the Fire Marshal, for review and approval if equivalent protection is provided and is in compliance with the spirit and intent of this Conceptual Fire Protection Plan.

Appendix A

Biological Resources Map

Figure 1, Regional Location

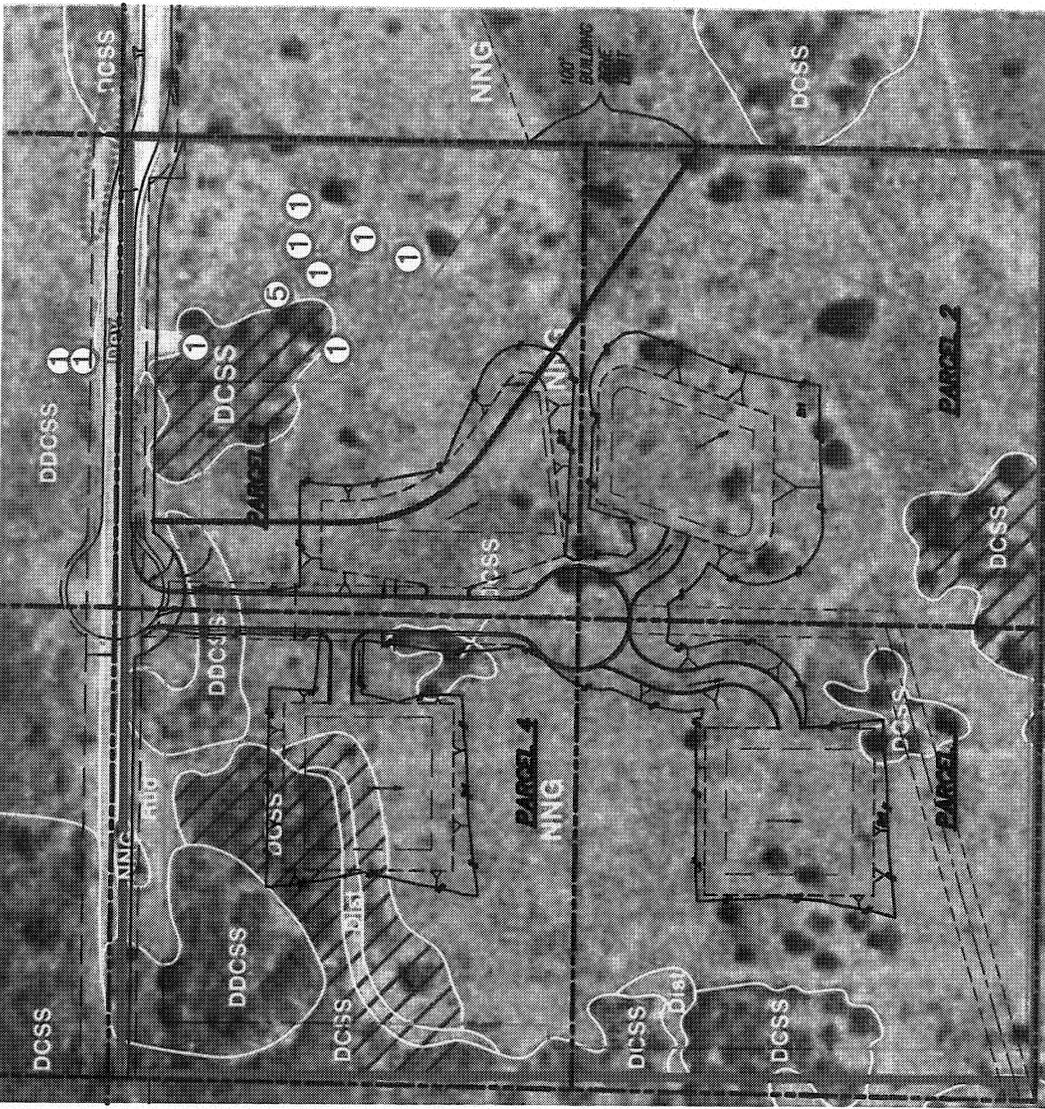
Figure 2, Coastal Sage Scrub, Trailside Road

Figure 3, Looking South, Trailside Road

Figure 4, Looking Southeast, Trailside Road

Figure 5, Black Sage at Trailside Road

BIOLOGICAL RESOURCES MAP FOR TENTATIVE PARCEL MAP 20076 RPL2

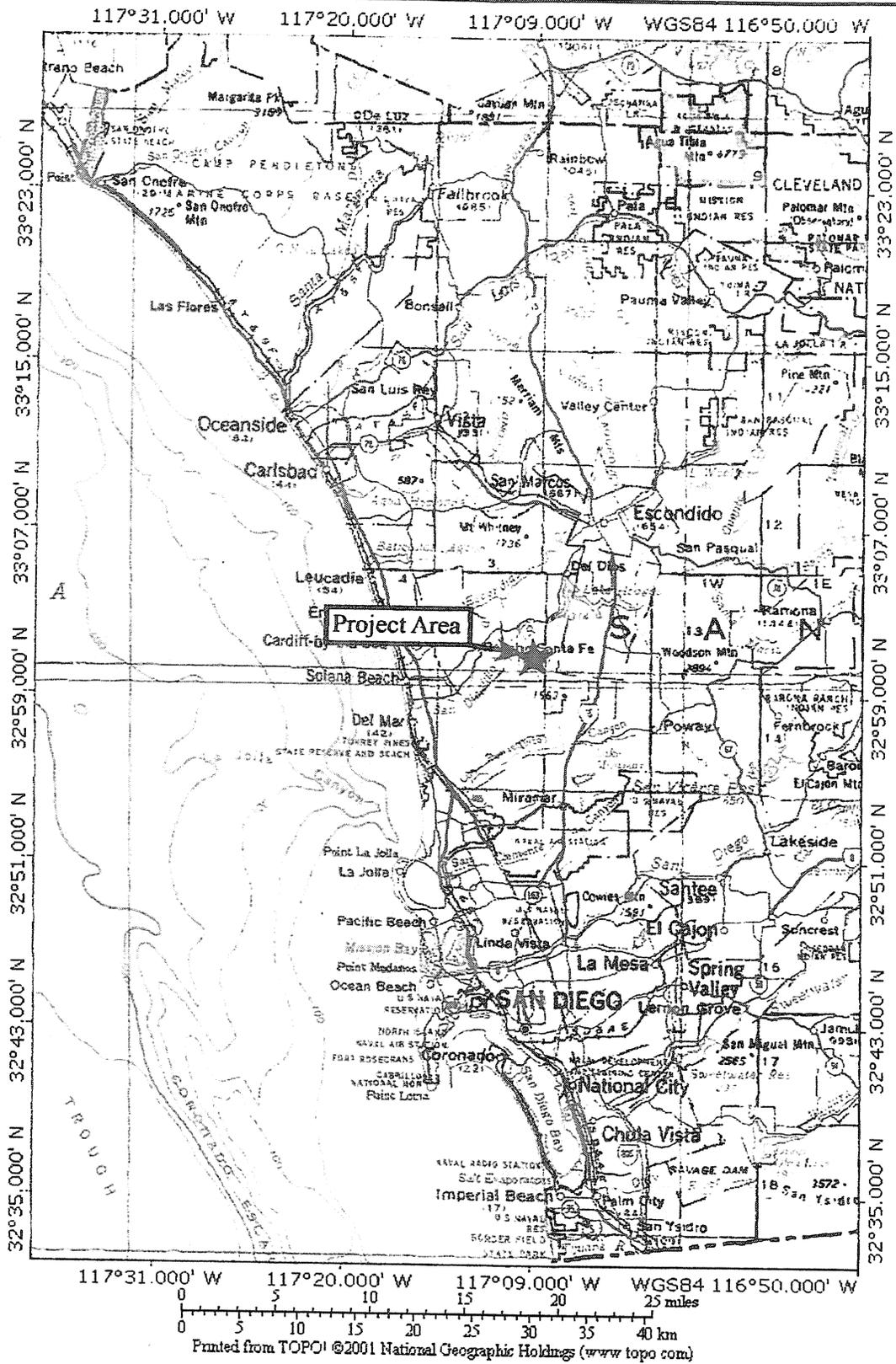


LEGEND

- DCSS DIEGAN COASTAL SAGE SCRUB
- DDCSS DISTURBED DIEGAN COASTAL SAGE SCRUB
- NNG NON-NATIVE GRASSLAND
- RUD RUDERAL
- DEV DEVELOPED
- DIST DISTURBED
- CA CALIFORNIA ADOLPHIA (LOCATION AND QUANTITY OF EACH OCCURRENCE)
- VC VERTICAL CURVE
- C.N.Y. GRADE NOT VERIFIED
- LIMITS OF PLANT SPECIES AND APPROXIMATE DISTURBED AREAS
- PROPOSED OPEN SPACE LIMITS
- PROPOSED FUEL MODIFICATION ZONE LIMIT
- PROPOSED BUILDING ZONE LIMIT
- GRADED PAD
- DIRECTION OF DRAINAGE
- CUT AND FILL SLOPE SYMBOL (2:1 MAX)
- DAYLIGHT GRADING



<p>NOI TE</p> <p>BEYOND ENGINEERING 650 AVENUE OF LEAVES, SUITE 200 SAN LEANDRO, CA 94588 TEL: (925) 338-8800 FAX: (925) 338-8801</p>	<p>BIOLOGICAL RESOURCES MAP</p> <p>PREPARED FOR: PARTNERS LAND</p> <p>DATE: 04-28-2008</p>
<p>SCALE: 1" = 100'</p>	
<p>DATE: 04-28-2008</p>	



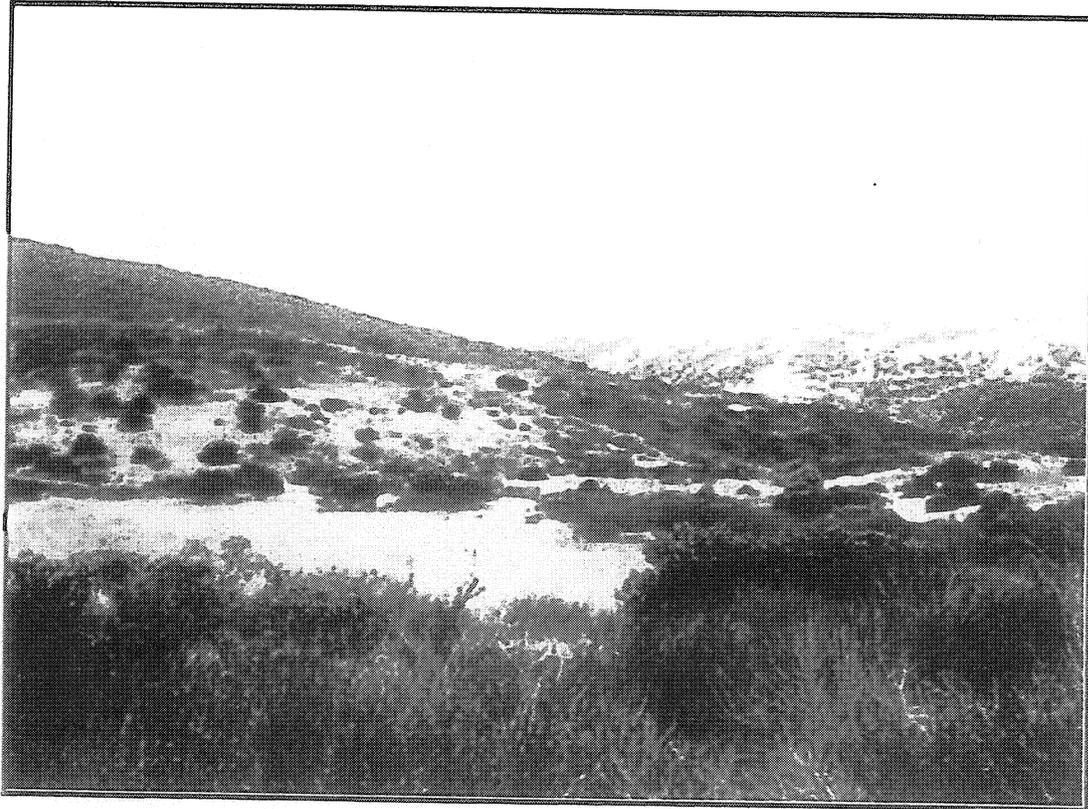
Regional Location

Figure 1



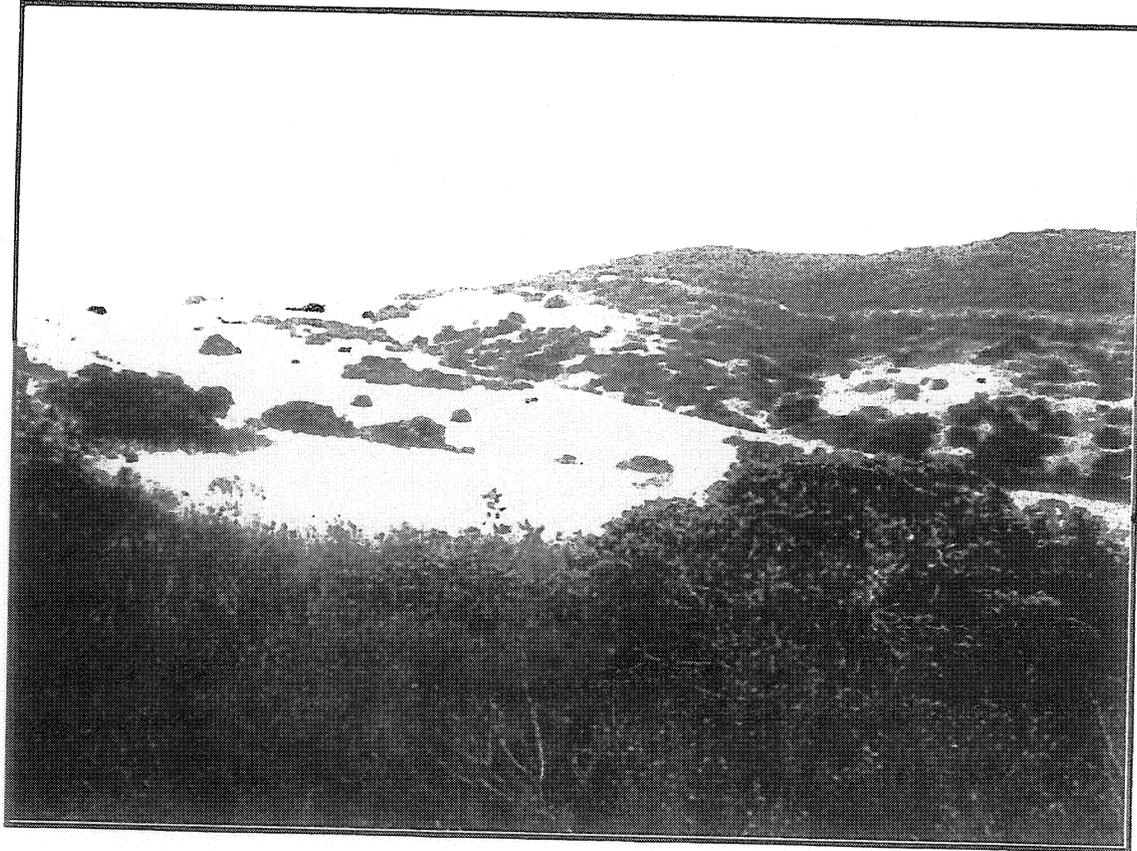
Coastal Sage Scrub, Trailside Road

Figure 2



Looking South, Trailside Road

Figure 3



Looking Southeast, Trailside Road

Figure 4



Black Sage at Trailside Road

Figure 5

Appendix B

Residential Driveway Standard Approach



Appendix C
Fire Protection Plan



Appendix D

Olivenhain Municipal Water District Water Modeling Report

Board of Directors

Robert F. Topolovac, *President*
Susan J. Varty, *Vice President*
Mark A. Muir, *Treasurer*
Harold L. Gano, *Secretary*
Jacob J. Krauss, *Director*



General Manager
David C. McCollom
Deputy General Manager/Operations
Harry Ehrlich
Assistant General Manager
Kimberly A. Thorne
General Counsel
Wesley Peltzer

1966 Olivenhain Road, Encinitas, California 92024 | Phone (760) 753-6466 | Fax (760) 753-1638 | www.omwd.com

December 13, 2006

Mr. Cliff Hunter
Rancho Santa Fe Fire Protection District
P.O. Box 410
Rancho Santa Fe, CA 92067

SUBJECT: FIRE FLOW AVAILABILITY
TPM 20975, Main Ext. 99C, District WO# 567820

This letter is being provided in response to a request from Nolte Engineering regarding the facilities required to serve TPM 20975, located at the intersection of Artesian Road and Caminito del Ventecito in the County of San Diego.

A water systems analysis (WSA) has been performed to analyze maximum day plus fire flow and peak hour demand conditions for the project¹. A copy of the analysis is enclosed for your records. Based on the results of that analysis, the facilities must be upsized to a 10-inch diameter pipeline from District's O-2 Pipeline up to the second to last hydrant along Extension 99C to the meet the minimum fire flow demand requirement of 2,500 GPM with a minimum residual pressure greater than 20 psi in the vicinity of the fire.

Should you have any questions or require additional information, please contact me at 760-632-4642.

Olivenhain Municipal Water District

Karen Ogawa
Engineering Coordinator

Cc Mr. Anthony Lang

¹ Water System Analysis for Extension 99C, Boyle Engineering, Job 23057.00 dated December 6, 2006.

7807 Convoy Court, Suite 200
San Diego, CA 92111
TEL: (858)268-8080
FAX: (858)292-7432
www.boyleengineering.com

Employee Owned

Mr. George R. Briest, PE, Engineering Manager
OLIVENHAIN MUNICIPAL WATER DISTRICT
1966 Olivenhain Road
Encinitas, CA 92024

December 6, 2006
23057.00

Extension 99C (OMWD WO#567820)

An hydraulic analysis was performed to determine if the proposed water system facilities are sufficient to serve the Ext 99C project. This project will consist of 4 single family dwelling units (estimated AAD of 5.9 gpm) and is located east of the intersection of Artesian Road and Caminito Del Ventecito and encompasses the following APN: 267-142-09-00. This proposed project is located within OMWD Zone 18 (HGL based on primary pressure reducing station valve setting is 652 ft).

The water facilities were analyzed during peak hour and maximum day plus 2,500 gpm fire flow conditions using the hydraulic computer model (H₂ONET[®]) from the District's 2000 Water Master Plan. Fire sprinkler flow conditions are not part of this analysis.

The results of the computer analyses indicate that with the installation of the proposed water facilities, this project can be served during a peak hour demand condition with a minimum residual pressure greater than 60 psi and during a maximum day plus 2,500 gpm fire flow demand condition with residual pressures greater than 20 psi in the vicinity of the fire.

Ext 99C Pressure Summary

<i>Maximum hydraulic gradient elevation based on 520 Vault PRS 6" valve:</i>	<i>652 feet</i>
<i>Street elevation range:</i>	<i>367-394 feet</i>
<i>Maximum pressure at street main based on 520 Vault PRS 6" valve:</i>	<i>112-123 psi</i>
<i>Minimum Residual Pressures:</i>	
<i>Max. day plus 2,500 gpm fire flow (at fire hydrant):</i>	<i>Greater than 20 psi</i>
<i>Peak Hour</i>	<i>Approx. 105 psi</i>

High velocities (approximately 16 fps) occur along the western segment of the existing 8-inch Ext. 99 during the fire flow event. As such this project is required to upsize a section of Ext. 99 to a 10-inch diameter (approximately 1000 feet) as shown on Figure 1. In addition, the project is required to install a 10-inch water main up to the second to last hydrant along Ext. 99C.

This hydraulic analysis is premised upon current criteria. It is not a representation, express or implied, that Olivenhain Municipal Water District will furnish water at a future date. Applications for service are governed by separate District rules and regulations, and are the subject of separate and distinct proceedings, apart from hydraulic analysis.

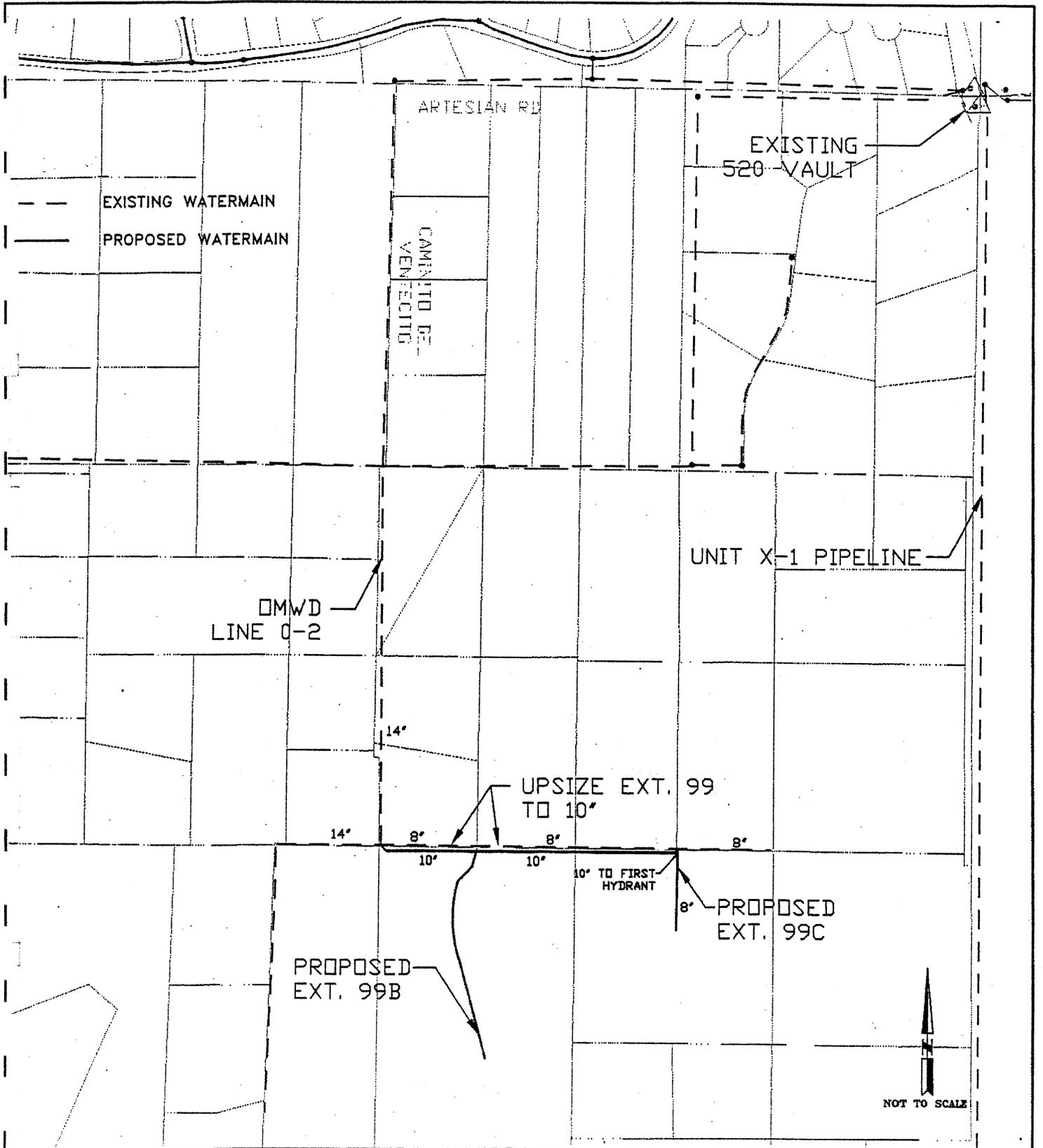
All water supplied by the District is imported from the Metropolitan Water District of Southern California via the San Diego County Water Authority. In the event that a water shortage or a threatened water shortage exists, the District reserves the right to restrict or terminate future water service to customers of the District. The District has adopted a water conservation ordinance, which is available to all applicants upon request.

If you have any questions or need additional information, please contact Alex Bucher at our office.

Boyle Engineering Corporation
District's Consulting Engineer


Anders K. Egense, PE
Project Manager

Enclosure: Figure 1



EXTENSION 99C
WATER SYSTEM ANALYSIS

BOYLE
ENGINEERS CORPORATION

OLIVENHAIN
Municipal Water District

PLATE 1
PROPOSED FACILITIES

23057.00

Appendix E

FRX Exterior Fire-Retardant Treated Wood Manufactures and Products

Filing Category: FIRE-RETARDANT-TREATED WOOD

FRX EXTERIOR FIRE-RETARDANT-TREATED WOOD

CHEMCO, INC.
POST OFFICE BOX 875
FERNDALE, WASHINGTON 98248

1.0 SUBJECT

FRX Exterior Fire-retardant-treated Wood.

2.0 DESCRIPTION

2.1 General:

Chemco, Inc., FRX fire-retardant-treated lumber and plywood are pressure-impregnated with FRX fire-retardant chemicals, in accordance with approved quality control procedures, and are for use in exterior applications, other than roofing applications, where the 1997 *Uniform Building Code*™ (UBC) or the 2000 *International Building Code*® (IBC) permit the use of wood or fire-retardant-treated wood.

2.2 Materials:

FRX is a fire-retardant chemical used in a pressure-treatment process for structural grade southern yellow pine and Douglas fir lumber.

The FRX treatment also applies to Structural 1 exterior-grade plywood of any species.

2.3 Limitations:

FRX treated wood products are not permitted to be used in contact with the ground, in roofing applications, or in interior locations.

2.4 Flame Spread:

FRX fire-retardant-treated lumber and plywood have a flame-spread rating of 25 or less when tested in accordance with UBC Standard 8-1 (ASTM E 84), and as modified by Section 207 of the UBC and Section 2303.2 of the IBC.

2.5 Structural Adjustment Factors:

The strength properties of lumber, when treated with FRX fire-retardant chemicals and used in applications at ambient temperatures up to 80°F (26.7°C), are subject to the design factors shown in Table 1.

Plywood, when treated with FRX fire-retardant chemicals and used in applications at temperatures up to 80°F (26.7°C), is subject to the span limitations shown in Table 2.

2.6 Fasteners:

Fasteners used in FRX fire-retardant-treated lumber and plywood must be hot-dipped galvanized steel, stainless

steel, silicon bronze or copper, and are subject to the strength adjustments indicated in Table 1.

2.7 Hygroscopicity:

FRX-treated lumber and plywood are not recognized for use in interior locations.

2.8 Installation:

Structural systems that include FRX fire-retardant-treated lumber or plywood must be designed and installed in accordance with the applicable code, using the appropriate lumber design value adjustment factors and plywood spans from Tables 1 and 2 of this report.

FRX lumber must not be ripped or milled, since this will alter the surface-burning characteristics and invalidate the flame-spread classification.

2.9 Identification:

Lumber and plywood treated with FRX fire-retardant chemicals must be identified by the structural grade mark of an approved agency. In addition, all treated lumber and plywood are stamped with the name of the quality control agency (Fire Tech Services, Inc.); the Chemco, Inc., name and address; the flame-spread rating; the treating date; and the evaluation report number (ICBO ES ER-5851). (See Figure 1.)

3.0 EVIDENCE SUBMITTED

Reports of tests conducted in accordance with the ICBO ES Acceptance Criteria for Fire-retardant-treated Wood (AC66), dated January 2002, and a quality control manual.

4.0 FINDINGS

That the FRX fire-retardant-treated lumber and plywood described in this report comply with the 1997 *Uniform Building Code*™, the 2000 *International Building Code*® and the 2000 *International Residential Code*®, subject to the following conditions:

4.1 Strength calculations are subject to the design factors or span ratings shown in Tables 1 and 2.

4.2 The strength design factors and span ratings given in this report are only used for unincised dimensional lumber and plywood of the species noted in this report.

4.3 The treated lumber and plywood are used where the fire-retardant-treated wood is permitted for exterior use under UBC Section 601.5.4, Item 2, and IBC Section 603.1, Item 1.2.

4.4 The treated lumber and plywood are not used in roofing applications.

ES REPORTS™ are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICBO Evaluation Service, Inc., express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



- 4.5 The treated wood is not used in contact with the ground.
- 4.6 The treated lumber is not ripped or milled, since this will alter the surface-burning characteristics and invalidate the flame-spread classification.

4.7 The lumber and plywood are treated at Ferndale, Washington, under a quality control program with inspections by Fire Tech Services, Inc. (AA-641).
 This report is subject to re-examination in one year.

**TABLE 1—STRENGTH DESIGN FACTOR
 RATIOS OF FRX FIRE-RETARDANT-TREATED LUMBER COMPARED TO UNTREATED LUMBER
 APPLICABLE AT TEMPERATURES UP TO 80°F (26.7°C)^{1,2}**

PROPERTY	SOUTHERN YELLOW PINE	DOUGLAS FIR
Compression parallel to grain	1.00	1.00
Horizontal shear	0.91	1.00
Tension parallel to grain	0.78	0.88
Bending: modulus of elasticity	1.00	0.96
Bending: extreme fiber stress	1.00	1.00
Fasteners/connectors	0.90	0.90

¹Duration of load adjustments for snow loads, seven-day (construction) loads, and wind loads are as specified in the UBC or IBC.
²FRX-treated lumber is not permitted in roof framing applications.

**TABLE 2—ALLOWABLE TOTAL SHEATHING LOAD (psf)
 FOR FRX-TREATED PLYWOOD^{1,2,3,4}**

PLYWOOD THICKNESS (inch)	PLYWOOD RATING	SPAN (inches)								
		12	16	19.2	24	30	32	36	40	48
5/16	20/0	185	104	67	47					
3/8	24/0	280	161	103	71	28				
18/32, 1/2	32/16	408	231	145	102	65	57			
18/32, 5/8	40/20	641	381	231	160	103	88	57	46	
23/32, 3/4	48/24	805	453	290	202	128	114	71	61	41

For SI: 1 inch = 25.4 mm, 1 psf = 47.9 N/m².

¹Fastener size and spacing must be as required in the code for untreated plywood of the same thickness.
²Plywood is Structural 1, exterior-grade.
³FRX-treated plywood is not permitted in roofing applications.
⁴Values are based on a reduction factor of 0.88.

CHEMCO, INC.
Ferndale, WA
FRX Pressure Treated
Fire Retardant Lumber

ICBO ES Report No. _____
Classification: Exterior

Species:

When tested per UBC Std. 8-1
(ASTM E 84) there was no evidence
of significant progressive
combustion when the test was
extended for 30 minutes.
FSI -
SDI -

Treated - Month/Year

Fire Tech Services, Inc.
(AA-641)

**MATERIAL NOT TO BE USED IN
ROOFING APPLICATIONS**

FIGURE 1—LUMBER STAMP

CHEMCO, INC.
Ferndale, WA
FRX Pressure Treated
Fire Retardant Plywood

ICBO ES Report No. _____
Classification: Exterior

Species:

When tested per UBC Std. 8-1
(ASTM E 84) there was no
evidence of significant progressive
combustion when the test was
extended for 30 minutes.
FSI -
SDI -

Treated - Month/Year

Fire Tech Services, Inc.
(AA-641)

**MATERIAL NOT TO BE USED IN
ROOFING APPLICATIONS**

FIGURE 2—PLYWOOD STAMP

ICC Evaluation Service, Inc.
www.icc-es.org

Business/Regional Office ■ 5380 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

DIVISION: 06—WOOD AND PLASTICS
Section: 06070—Wood Treatment

REPORT HOLDER:

HOOVER TREATED WOOD PRODUCTS, INC.
154 WIRE ROAD
THOMSON, GEORGIA 30824
(706) 595-7355
www.frtw.com

EVALUATION SUBJECT:

PYRO-GUARD® FIRE-RETARDANT-TREATED WOOD

ADDITIONAL LISTEES:

JASPER WOOD PRODUCTS, LLC
37385 JASPER LOWELL ROAD
JASPER, OREGON 97438

KILFOYLE KRAFTS
1510 SOUTH HIGHWAY 10
PRICE, UTAH 84501

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 International Building Code® (IBC)
- 2003 International Residential Code® (IRC)
- 1997 Uniform Building Code™ (UBC)
- BOCA® National Building Code®/1999 (BNBC)
- 1999 Standard Building Code® (SBC)

Properties evaluated:

- Flame spread
- Structural strength
- Corrosion
- Hygroscopicity

2.0 USES

PYRO-GUARD® fire-retardant-treated wood is used in areas not exposed to the weather or wetting where the code permits the use of wood or fire-retardant-treated wood.

3.0 DESCRIPTION

3.1 General:

PYRO-GUARD® fire-retardant-treated wood is lumber and plywood that is pressure impregnated with the Hoover Treated Wood Products, Inc., fire retardant chemical PYRO-

GUARD®, PYRO-GUARD® fire-retardant-treated lumber and plywood is produced in accordance with an approved quality control procedure at facilities listed in Section 5.9 of this report.

PYRO-GUARD® treated lumber of the following species is recognized as being fire-retardant-treated wood: alpine fir, balsam fir, black spruce, Douglas fir, Englemann spruce, hem-fir, jack pine, lodgepole pine, ponderosa pine, red spruce, southern pine, spruce-pine-fir (SPF), western hemlock, white fir, and white spruce.

PYRO-GUARD® treated plywood fabricated with face and back veneers of the following species is recognized as being fire-retardant-treated wood: southern pine and Douglas fir for structural applications, and lauan for interior applications.

3.2 Flame Spread:

PYRO-GUARD® fire-retardant-treated wood, when tested in accordance with ASTM E 84 modified in accordance with Section 2303.2 of the IBC, has a flame-spread index of 25 or less.

3.3 Structural Strength:

The structural performance of PYRO-GUARD® fire-retardant-treated wood has been evaluated using ASTM D 5516 and D 6305 for plywood and ASTM D 5864 and D 6841 for lumber. The effects of the PYRO-GUARD® treatment on the strength of treated lumber shall be accounted for in the design of wood members and their connections. Load-duration factors greater than 1.6 shall not be used in design.

3.3.1 Lumber: The design value adjustments in Table 2 shall be used to modify the design values for untreated lumber found in the AF&PA National Design Specification (NDS) Supplement Design Values for Wood Construction, for the applicable species, use and property. Southern pine and Douglas fir have been evaluated for use in roof framing and shall be subjected to the adjustments indicated in Table 2 for roof framing. Other softwood species described in Section 3.1 shall be subjected to the design adjustments indicated in Table 2 for service temperatures up to 100°F (38°C).

3.3.2 Plywood: The maximum loads and spans shown in Table 1 shall be used to modify the panel span rating for untreated plywood described in the applicable codes, as determined by thickness and construction. The adjusted maximum loads and spans are based on tests of southern pine and Douglas fir and are applicable to all softwood species.

3.4 Corrosion:

The corrosion rate of aluminum, carbon steel, galvanized steel, copper or red brass in contact with wood is not increased by PYRO-GUARD® fire-retardant treatment when the product is used as recommended by Hoover Treated Wood Products.

ES REPORTS™ are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, Inc., express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



3.5 Hygroscopicity:

The moisture content of PYRO-GUARD® fire-retardant-treated lumber and plywood is less than 28 percent when evaluated in accordance with ASTM D 3201 at 92 percent relative humidity (Section 2303.2.4 of the IBC). PYRO-GUARD® is suitable for use in interior conditions where sustained relative humidity is 92 percent or less and condensation does not occur.

4.0 DESIGN AND INSTALLATION

Structural systems that include PYRO-GUARD® fire-retardant-treated lumber or plywood shall be designed and installed in accordance with the applicable code using the appropriate lumber design value adjustment factors and plywood spans from Tables 1 and 2 of this report. Ventilation shall be provided in compliance with the applicable codes.

Fasteners used in PYRO-GUARD® fire-retardant-treated wood shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper, in accordance with IBC Section 2304.9.5, IRC Section R319.3, UBC Section 2304.3, and SBC Section 2306.3, and shall be subject to the design value adjustments indicated in Table 2 of this report.

5.0 CONDITIONS OF USE

The PYRO-GUARD fire-retardant-treated wood described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 All strength calculations shall be subject to the design factors or span ratings shown in Tables 1 and 2 of this report.
- 5.2 The strength design factors and span ratings given in this report shall only be used for unincised dimensional lumber and plywood of the species noted in this report.
- 5.3 All of the wood species listed in Section 3.1 of this report are permitted for interior applications and have been evaluated for structural performance for interior applications where the service temperature does not exceed 100°F (37.8°C). Southern pine and Douglas fir have been evaluated for structural performance for roof framing applications as indicated in Table 2 of this report. Southern pine and Douglas fir plywood are permitted for structural applications limited to the spans and loads indicated in Table 1 of this report.
- 5.4 PYRO-GUARD treated wood shall not be installed where it will be exposed to weather or damp or wet conditions.
- 5.5 PYRO-GUARD treated wood shall not be used in contact with the ground.
- 5.6 Except for the following, PYRO-GUARD lumber shall not be ripped or milled, as this may alter the surface-burning characteristics and invalidate the flame-spread classification: End cuts, holes, and joints such as tongue and groove, bevel, scarf and lap may be used.
- 5.7 Exposure to precipitation during storage or installation shall be avoided. If material does become wet, it shall be replaced or permitted to dry (maximum 19 percent moisture content for lumber and 15 percent moisture content for plywood) prior to covering or enclosure by wallboard or other construction materials (except for protection during construction).
- 5.8 The strength design factors and plywood spans in Tables 1 and 2 of this report are applicable under elevated temperatures resulting from cyclic climatic conditions in the continental United States. They are not applicable under continuous elevated temperatures resulting from manufacturing or other processes which shall require special consideration in design. Such conditions are outside the scope of this report.
- 5.9 Treatment is at the facilities of Hoover Treated Wood Products, Inc., in Thomson, Georgia, Pine Bluff, Arkansas, Milford, Virginia, Detroit, Michigan, and Winston, Oregon, and the Jasper Wood Products facility in Jasper, Oregon; and the Kilfoyle Krafts facility in Price, Utah; under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668) and Timber Products Inspection Inc. (AA-696).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fire-retardant-treated Wood (AC86), dated November 2005.

7.0 IDENTIFICATION

Lumber and plywood treated with PYRO-GUARD® fire-retardant chemicals shall be identified by the structural grade mark of an approved agency. In addition, all treated lumber and plywood shall be stamped with the name of the inspection agency [Underwriters Laboratories Inc. (AA-668) or Timber Products Inspection Inc. (AA-696)], the Hoover Treated Wood Products, Inc., name and address, labeling information in accordance with Section 2303.2.1 of the IBC, and the evaluation report number (ESR-1791).

TABLE 1— MAXIMUM LOADS AND SPANS FOR PYRO-GUARD® TREATED PLYWOOD

PLYWOOD ¹ THICKNESS (Inches)	UNTREATED ROOF/SUBFLOOR SPAN RATING	PYRO-GUARD ^{1,2,3,4,5,6,7,8,9,10,11,12} ROOF SHEATHING MAX. LIVE LOAD (psf)				PYRO-GUARD ^{13,14} Span (Inches)
		Span (Inches)	Climate Zone ^{15,7}			
			1A	1B	2	
$\frac{15}{32}, \frac{1}{2}$	32/16	24	19	30	43	16
$\frac{19}{32}, \frac{5}{8}$	40/20	24 32	42 20	64 32	87 45	20 20
$\frac{23}{32}, \frac{3}{4}$	48/24	32 48	34 10	51 18	71 27	24 24
$\frac{7}{8}$	—	48	12	20	30	—
$1\frac{1}{8}$	—	48	21	33	47	48

For SI: 1 inch = 25.4 mm, 1 psf = 48 N/m².

¹All loads are based on two-span condition with panels 24 inches wide or wider, strength axis perpendicular to supports.

²Fastener size and spacing shall be as required in the applicable building code for untreated plywood of the same thickness; except that roof sheathing shall be fastened with (1) minimum 8d common or 8d deformed shank nails spaced a maximum 8 inches o.c. at edges and a maximum of 12 inches o.c. at intermediate supports for panels on 24- and 32-inch spans and spaced a maximum of 8 inches o.c. on all supports for panels on a 48-inch span, or (2) other fasteners with comparable withdrawal and lateral load capacities at the same maximum spacings. For $1\frac{1}{8}$ -inch roof sheathing panels, use minimum 10d common or deformed shank nails.

³Roof spans and loads apply to roof systems having the minimum ventilation areas required by the applicable building code. Fifty percent of required vent area shall be located on upper portion of sloped roofs to provide natural air flow.

⁴For low-sloped or flat roofs with membrane or built-up roofing having a perm rating less than 0.2, use rigid insulation having a minimum R value of 4.0 between sheathing and roofing, or use next thicker panel than tabulated for the span and load (e.g., $\frac{19}{32}$ for 24 inches, $\frac{23}{32}$ for 32 inches); and use a continuous ceiling air barrier and vapor retarder with a perm rating less than 0.2 on the bottom of the roof framing above the ceiling finish.

⁵Panel edge clips are required for roof sheathing: one midway between supports for 24-inch and 32-inch spans, two at $\frac{1}{3}$ points between supports for 48-inch span. Clips shall be specifically manufactured for the plywood thickness used.

⁶Tabulated loads for Zone 1A are based on a duration of load adjustment for 7-day (construction) loads of 1.25. Tabulated loads for Zone 1B and Zone 2 are based on a duration of load adjustment for snow of 1.15. All values within the table are based on a dead load (DL) of 8 psf. If the DL is less than or greater than 8 psf, the tabulated live load shall be increased or decreased by the difference. Applicable material weights, psf: asphalt shingles - 2.0, $\frac{1}{2}$ -inch plywood - 1.5, $\frac{3}{4}$ -inch plywood - 1.8, $\frac{5}{8}$ -inch plywood - 2.2.

⁷Climate Zone definition:

1 - Minimum design roof live load or maximum ground snow load up to 20 psf:

A - Southwest Arizona, Southeast Nevada (Las Vegas-Yuma-Phoenix-Tucson triangle)

B - All other qualifying areas of the continental United States

2 - Minimum ground snow load over 20 psf

⁸PYRO-GUARD® treated plywood shall not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.

⁹The $\frac{19}{32}$ -inch and $\frac{5}{8}$ -inch thicknesses are limited to performance rated 4-ply or 5-ply. $\frac{23}{32}$ - and $\frac{3}{4}$ -inch thicknesses are limited to performance rated 5-ply or 7-ply.

¹⁰Subfloor applications are limited to 100 psf maximum live load, except $1\frac{1}{8}$ -inch thickness on 48-inch span limited to 65 psf total load.

¹¹Deflection of roof sheathing at tabulated maximum live load is less than $\frac{1}{240}$ of the span, and under maximum live load plus dead load is less than $\frac{1}{180}$ of the span.

¹²Staples used to attach asphalt shingles shall be minimum $\frac{19}{16}$ -inch crown and minimum 1-inch leg, or otherwise comply with the applicable code, with the quantity of fasteners adjusted in accordance with Table 2 of this report.

TABLE 2—DESIGN VALUE ADJUSTMENTS FOR PYRO-GUARD® TREATED LUMBER

PROPERTY	SERVICE TEMPERATURE ^a TO 100°F/38°C			PYRO-GUARD® ROOF FRAMING, CLIMATE ZONE ^{1,2}					
	SP	DF	Other	1A		1B		2	
				SP	DF	SP	DF	SP	DF
Extreme fiber in bending	0.91	0.97	0.88	0.90	0.90	0.85	0.93	0.89	0.96
Tension parallel to grain	0.88	0.95	0.83	0.90	0.90	0.84	0.87	0.88	0.93
Compression parallel to grain	0.94	1.00	0.94	0.94	0.94	0.94	0.98	0.94	1.00
Horizontal shear	0.95	0.96	0.83	0.92	0.95	0.93	0.95	0.94	0.96
Modulus of elasticity	0.95	0.96	0.94	0.95	0.96	0.95	0.96	0.95	0.96
Compression perp. to grain	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fasteners/connectors	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

¹Climate Zone definition:

- 1 - Minimum design roof live load or maximum ground snow load up to 20 psf:
 - A - Southwest Arizona, Southeast Nevada (Las Vegas-Yuma-Phoenix-Tucson triangle)
 - B - All other qualifying areas of the Continental United States
- 2 - Minimum ground snow load over 20 psf

²Duration of load adjustments for snow loads, 7-day (construction) loads, and wind loads given in the National Design Specifications for Wood Construction apply.

³Where lumber decking serves as both exposed ceiling and roof sheathing, use extreme fiber in bending adjustments of 0.84, 0.83, and 0.89 for southern pine zones 1A, 1B, and 2, respectively; 0.92, 0.92, and 0.96 for Douglas fir zones 1A, 1B, and 2, respectively; except that where insulation having a minimum R value of 4.0 is installed above the decking, extreme fiber in bending adjustments of 0.91 for southern pine and 0.97 for Douglas fir are permitted in all zones.

⁴Modulus of elasticity values apply to all treated lumber decking.

⁵Roof framing adjustment factors apply to roof systems with minimum ventilation areas per applicable code. Locate 50 percent of required vent area on upper portion of sloped roofs to provide natural air flow.

⁶Species: SP - southern pine; DF - Douglas fir; Other softwoods - limited to those species listed in Section 3.1 of this report.

<p>PYRO-GUARD® — HOOVER — TREATED WOOD PRODUCTS INC. (PLANT LOCATION) PROCESS CONTROL STANDARD 2200P MONITORED BY TP</p> <p style="text-align: center;">KDAT ICC-ESR-1791 KDAT MEA-359-88-M</p>	<div style="text-align: center;">  <p>TREATED LUMBER 15P9 R7002</p> <p>SPECIES</p> <p>SURFACE BURNING CHARACTERISTICS</p> <p>FLAMESPREAD:</p> <p>SMOKE DEVELOPED:</p> <p style="text-align: center;">30 MINUTE TEST</p> </div>
--	---

<p>PYRO-GUARD® — HOOVER — TREATED WOOD PRODUCTS INC. (PLANT LOCATION) PROCESS CONTROL STANDARD 2200P MONITORED BY TP</p> <p style="text-align: center;">KDAT ICC-ESR-1791 KDAT</p>	<div style="text-align: center;">  <p>TREATED PLYWOOD 17PO R7003</p> <p>SPECIES</p> <p>SURFACE BURNING CHARACTERISTICS</p> <p>FLAMESPREAD:</p> <p>SMOKE DEVELOPED:</p> <p style="text-align: center;">30 MINUTE TEST</p> </div>
---	--

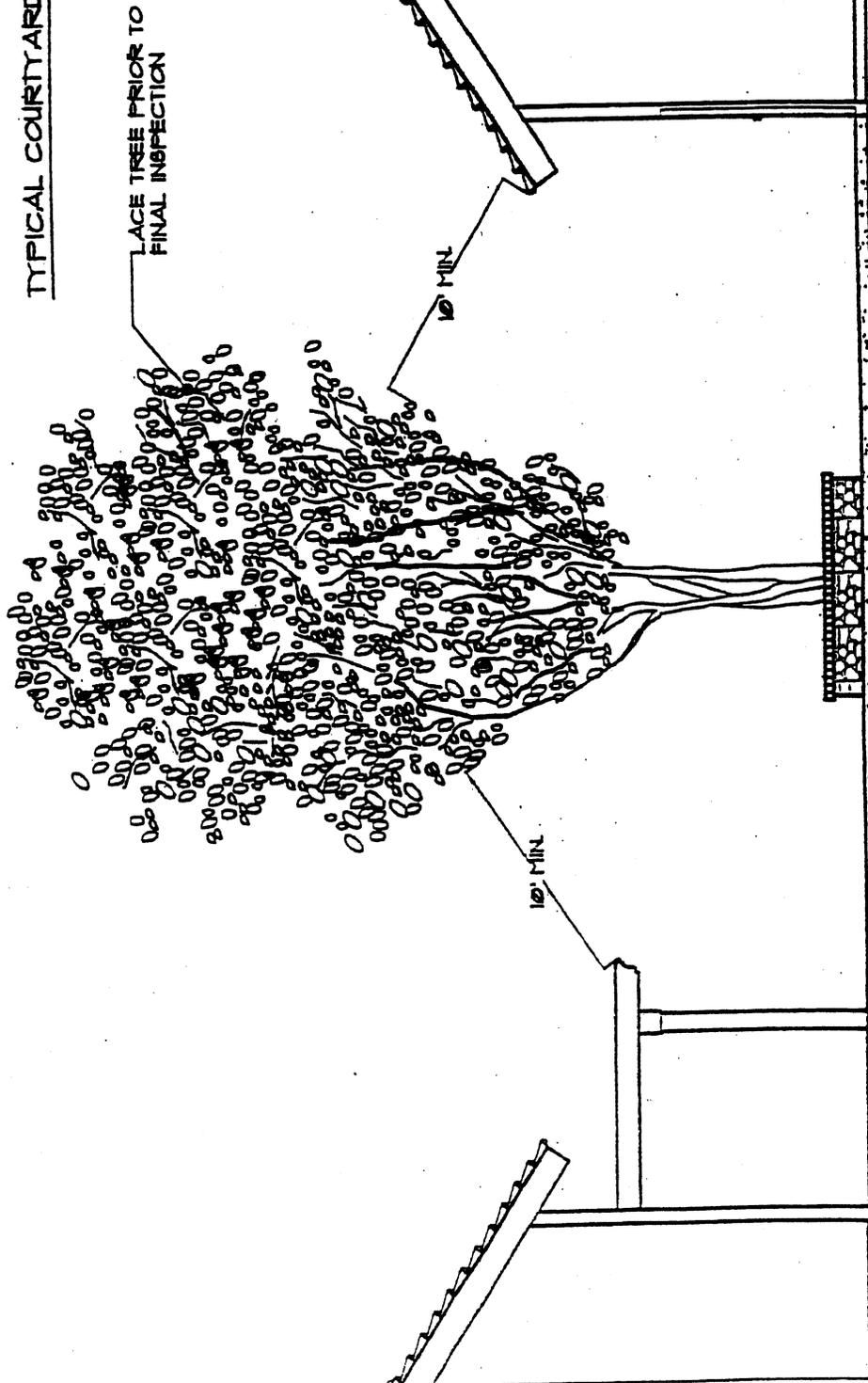
FIGURE 1—LUMBER AND PLYWOOD STAMPS

Appendix F

Typical Courtyard Tree Canopy Setback



TYPICAL COURTYARD TREE CANOPY SETBACK



Appendix G

San Diego County Fire Chief's Association Fuel Modification Zone Plant List



SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
 FUEL MODIFICATION ZONE PLANT LIST
 July 15, 1997

	Code	Botanical Name	Common Name	Plant Type
1	W	Abelia x grandiflora	Glossy Abelia	Shrub
2	<input checked="" type="checkbox"/>	Acacia redolens	Desert Carpet	Shrub
3	<input type="checkbox"/>	Acer macrophyllum	Big Leaf Maple	Tree
		Agave attenuata	Century Plant	Succulent
5	W	Achillea Tomentosa	Woolly Yarrow	Low shrub
6	X	Aeonium decorum	Aeonium	Ground cover
7	X	Aeonium simsii	ncn	Ground cover
8	W	Agave attenuata	Century Plant	Succulent
9	<input type="checkbox"/>	Agave shawii	Shaw's Century Plant	Succulent
10	N	Agave victoriae-reginae	ncn	Ground cover
11	X	Ajuga reptans	Carpet Bugle	Ground cover
12	W	Alnus cordata	Italian Alder	Tree
13	<input type="checkbox"/>	Alnus rhombifolia	White Alder	Tree
14	N	Aleo arborescens	Tree Aloe	Shrub
15	N	Aloe aristata	ncn	Ground cover
16	N	Aloe brevifolia	ncn	Ground cover
17	W	Aloe vera	Medicinal Aloe	Succulent
18	W	Alyogyne huegelii	Blue Hibiscus	Shrub
19	<input type="checkbox"/>	Ambrosia chamissonis	Beach Bur-Sage	Perennial
20	<input type="checkbox"/>	Amorpha fruticosa	Western False Indigobush	Shrub

FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
21	W	Anigozanthus flavidus	Kangaroo Paw	Perennial accent
22	<input type="checkbox"/>	Antirrhinum nuttalianum ssp. nuttalianum	ncn	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	<input type="checkbox"/>	Arctostaphylos glandulosa ssp.	Eastwood Manzanita	Shrub
28	W	Arctostaphylos hookeri 'Monterey Carpet'	Monterey carpet Manzanita	Low Shrub
29	N <input type="checkbox"/>	Arctostaphylos pungens		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 Artemisia	Ground cover
34	X	Artemisia pycnocephala	Beach Sagewort	Perennial
35	X	Atriplex canescens	Four-Wing Saltbush	Shrub
36	X <input type="checkbox"/>	Atriplex lentiformis ssp. breweri	Brewer Saltbush	Shrub
37	<input type="checkbox"/>	Baccharis emoryi	Emory Baccharis	Shrub
38	W <input type="checkbox"/>	Baccharis pilularis ssp. consanguinea	Chaparral Bloom	Shrub
39	X	Baccharis pilularis var. pilularis 'Twin Peaks#2'	Twin Peaks	Ground cover
40	<input type="checkbox"/>	Baccharis salicifolia	Mulefat	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
41	N	Baileya pauciradiata	Desert Marigold	Ground cover
42	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small tree
43	N☐	Bougainvillea spectabilis	Bougainvillea	Shrub
44	N☐	Brahea armata	Mexican Blue Palm Blue Hesper Palm	Palm
45	N☐	Brahea brandegeei	San Jose Hesper Palm	Palm
46	N☐	Brahea edulis	Guadalupe Palm	Palm
47	☐	Brickellia californica		Subshrub
48	w ☐	Bromus carinatus	California Brome	Grass
49	☐	Camissonia cheiranthifolia	Beach Evening Primrose	Perennial subshrub
50	N	Carissa macrocarpa	Green Carpet Natal Plum	Ground cover/Shrub
51	X	Ceanothus glandulosus	Scrub Toy Plant	Ground cover
52	W	Ceanothus gloriosus 'Point Reyes'	Point Reyes Ceanothus	Shrub
53		Ceanothus glaucus 'Point Redwood'	Point Redwood Ceanothus	Shrub
54	W	Ceanothus glaucus 'Yankee Point'	Yankee Point Ceanothus	Ground cover
55	W	Ceanothus glaucus 'var. horizontalis'	Common Ceanothus	Shrub
56	W	Ceanothus glaucus 'var. horizontalis - Yankee Point'	Yankee Point Ceanothus	Shrub
57	☐	Ceanothus leucanthus	Big Pod Ceanothus	Shrub
58	W	Ceanothus prostratus	Squaw Carpet Ceanothus	Shrub
59	☐	Ceanothus spinosus	Green Bark Ceanothus	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
--	------	----------------	-------------	------------

60	N <input type="checkbox"/>	Ceanothus verruscus	Wart-Stem Ceanothus	Shrub
61	W	Cerastium tomentosum	Snow-in-Summer	Ground cover/Shrub
62	W	Ceratonia siliqua	Carob	Tree
63	W <input type="checkbox"/>	Cercis occidentalis	Western Redbud	Shrub/Tree
64	X	Chrysanthemum leucanthemum	Oxeye Daisy	Ground cover
65		Cistus monspeliensis		Ground cover
66	W	Cistus hybridus	White Rockrose	Shrub
67	W	Cistus laurifolius		Shrub
68	W	Cistus incanus ssp. cotinifolius		Shrub
69		Cistus sp.		Shrub
70		Cistus sp.		Shrub
71		Cistus sp.		Shrub
72	<input type="checkbox"/>	Clarkia purpurea or unguiculata	Showy Fairwell to spring	Annual
73	<input type="checkbox"/>	Cneoridium dumosum	Bushrue	Shrub
74	<input type="checkbox"/>	Collinsia heterophylla	Chinese Houses	Annual
75	w <input type="checkbox"/>	Comarostaphylis diversifolia	Summer Holly	Shrub
76		Corymbium californicum	Bushy Waxwood Clam	Shrub
77	W	Coprosma kirkii	Creeping Coprosma	Ground cover/Shrub
78	W	Coprosma pumila	Prostrate Coprosma	Low Shrub
79	<input type="checkbox"/>	Coreopsis californica	California Coreopsis	Annual
80	W	Coreopsis lanceolata	Coreopsis	Ground Cover

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
81	N	Correa pulchella	Australian Fuchsia	Ground cover
82	W	Cotoneaster buxifolius	ncn	Shrub
83	W	Cotoneaster congestus 'Likiang'	Likiang Cotoneaster	Ground cover/Vine
84	W	Cotoneaster Parneyi	ncn	Shrub
85	X	Crassula Lactea	ncn	Ground cover
86	X	Crassula multicava	ncn	Ground cover
87	X	Crassula ovata	Jade Tree	Shrub
88	X	Crassula tetragona	ncn	Ground cover
89	w□	Croton californicus	California Croton	Ground cover
90	X	Delosperma 'alba'	White Trailing Ice Plant	Ground cover
91	□	Dendromecon rigida	Bush Poppy	Shrub
92	□	Dichelostemma Capitatum	Blue Dicks	Herb
93	N	Distictis 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	ncn	Ground cover
97	X	Drosanthemum speciosum	Dewflower	Ground cover
98	□	Dudleya lanceolata	Lance-leaved Dudleya	Succulent
99	□	Dudleya pulverulenta	Chalk Dudleya	Succulent
100	W	Elaeagnus pungens	Silverberry	Shrub
101	□	Encelia californica	California Encelia	Small Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Type
102	<input type="checkbox"/>	<i>Epilobium canum</i> (<i>Zauschneria californica</i>)	Hoary California Fuchsia	Shrub
103	<input type="checkbox"/>	<i>Eriastrum sapphirinum</i>	Majave Woolly Star	Annual
104	N	<i>Eriobotrya japonica</i>	Loquat	Tree
105	<input type="checkbox"/>	<i>Eriodictyon crassifolium</i>	Thick-Leaf Yerba Santa	Shrub
106	<input type="checkbox"/>	<i>Eriodictyon trichocalyx</i>	Yerba Santa	Shrub
107	w <input type="checkbox"/>	<i>Eriophyllum confertiflorum</i>	ncn	Shrub
108	W	<i>Erythrina species</i>	Coral Tree	Tree
109	N	<i>Escallonia species</i>	several varieties	Shrub
110	w <input type="checkbox"/>	<i>Eschscholzia californica</i>	California Poppy	Flower
111	X	<i>Eschscholzia mexicana</i>	Mexican Poppy	Herb
112	N	<i>Euonymus fortunei</i>	Winter Creeper Euonymus	Ground cover
113	N	<i>Feijoa sellowiana</i>	Pineapple Guava	Shrub/Tree
114	N	<i>Fragaria chiloensis</i>	Wild Strawberry /Sand Strawberry	Ground cover
115	<input type="checkbox"/>	<i>Frankenia salina</i>	Alkali Heath	Ground cover
116	W <input type="checkbox"/>	<i>Fremontodendron californicum</i>	California Flannelbush	Shrub
117	X	<i>Gaillardia x grandiflora</i>	Blanketflower	Ground cover
118	W	<i>Galvezia speciosa</i>	Bush Snapdragon	Shrub
119	W	<i>Garrya veatchii</i>	Silktassel	Shrub
120	X	<i>Gazania hybrids</i>	South African Daisy	Ground cover
121	X	<i>Gaxania rigens leucolaena</i>	Trailing Gazania	Ground cover

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
122	<input type="checkbox"/>	Gilia capitata	Globe Gilia	Perennial
123	W	Gilia leptantha	Showy Gilia	Perennial
124	W	Gilia tricolor	Bird's Eyes	Perennial
125	W	Ginkgo biloba	Maidenhair Tree	Tree
126	<input type="checkbox"/>	Gnaphalium californicum	California Everlasting	Annual
127	W	Grewia occidentalis	Starflower	Shrub
128	<input type="checkbox"/>	Grindelia camporum bracteosum	Gum Plant	Ground cover
129	N <input checked="" type="checkbox"/>	Hakea suaveolens	Sweet Hakea	Shrub
130	W	Hardenbergia comptoniana	Lilac Vine	Shrub
131	N	Helianthemum mutabile	Sunrose	Ground cover /Shrub
132	<input type="checkbox"/>	Helianthemum scoparium	Rush Rose	Shrub
133	<input type="checkbox"/>	Heliotropium curassavicum	Salt Heliotrope	Ground cover
135	W	Hesperaleo parviflora	Red Yucca	Perennial
136	<input checked="" type="checkbox"/>	Heteromeles arbutifolia	Toyon	Shrub
137	X	Hypericum calycinum	Aaron's Beard	Shrub
138	N	Iberis Sempervirens	Edging Candytuft	Ground cover
139	N	Iberis Umbellatum	Globe Candytuft	Ground cover
140	<input type="checkbox"/>	Isocoma menziesii	Coastal Goldenbush	Small shrub
141	<input type="checkbox"/>	Isomeris arborea	Bladderpod	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
142	W <input type="checkbox"/>	<i>Iva hayesiana</i>	Poverty Weed	Ground cover
143	N <input type="checkbox"/>	<i>Juglans californica</i>	California Black Walnut	Tree
144	<input type="checkbox"/>	<i>Juncus acutus</i>	Yellow Bush Penstemon	Subshrub
145	<input type="checkbox"/>	<i>Keckiella antirrhinoides</i>	Yellow Bush Penstemon	Subshrub
146	<input type="checkbox"/>	<i>Keckiella cordifolia</i>	Heart Leaved Penstemon	Subshrub
147	<input type="checkbox"/>	<i>Keckiella ternata</i>	Blue Stemmed Bush Penstemon	Subshrub
148	W	<i>Kniphofia uvaria</i>	Red Hot Poker	Perennial
149	W	<i>Lagerstroemia indica</i>	Crape Myrtle	Tree
150	W	<i>Lagunaria patersonii</i>	Primrose Tree	Tree
151	X	<i>Lampranthus aurantiacus</i>	Bush Ice Plant	Ground cover
152	X	<i>Lampranthus filicaulis</i>	Redondo Creeper	Ground cover
153	X	<i>Lampranthus spectabilis</i>	Trailing Ice Plant	Ground cover
154	W	<i>Lantana camara</i> cultivars	Yellow Sage	Shrub
155	W	<i>Lantana montevidensis</i>	Trailing Lantana	Shrub
156	<input type="checkbox"/>	<i>Lasthenia californica</i>	Dwarf Goldfields	Annual
157	W	<i>Lavandula dentata</i>	French Lavendar	Shrub
158	W	<i>Leptospermum laevigatum</i>	Australian Tea Tree	Shrub
159	W	<i>Leucophyllum frutescens</i>	Texas Ranger	Shrub
160	<input type="checkbox"/>	<i>Leymus condensatus</i>	Giant Wild Rye	Large grass
161	N	<i>Ligustrum japonicum</i>	Texas Privet	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
 FUEL MODIFICATION ZONE PLANT LIST
 July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
--	------	----------------	-------------	------------

162	X	Limonium pectinatum	ncn	Ground cover
163	X	Limonium perezii	Sea Lavender	Shrub
164	w <input checked="" type="checkbox"/>	Liquidambar styraciflua	American Sweet Gum	Tree
165	W	Liriodendron tulipifera	Tulip Tree	Tree
166	X	Lonicera japonica 'Halliana'	Hall's Japanese Honeysuckle	Vining shrub
167	<input type="checkbox"/>	Lonicera subspicata	Wild Honeysuckle	Vining shrub
168	X	Lotus corniculatus	Bird's Foot Trefoil	Ground cover
169	<input type="checkbox"/>	Lotus heermannii	Northern Woolly Lotus	Perennial
170	<input type="checkbox"/>	Lotus scoparius	Deerweed	Shrub
171	W <input type="checkbox"/>	Lupinus arizonicus	Desert Lupine	Annual
172	W	Lupinus benthamii	Spider Lupine	Annual
173	<input type="checkbox"/>	Lupinus bicolor	Sku Lupine	Flowering annual
174	<input type="checkbox"/>	Lupinus sparsiflorus	Lupini/Coulter's Lupine	Annual
175	W	Lyonothammus florbundus ssp. asplenifollus	Fernleaf Ironwood	Tree
176	W	Macadamia integrifolia	Golden Abundance Oregon	Shrub
177	W	Mahonia aquifolium 'Golden Abundance'	Golden Abundance Oregon Grape	Shrub
178	W	Mahonia nevinii	Nevin Mahonia	Shrub
179	<input type="checkbox"/>	Malacothamnus fasciculatus	Chaparral Mallow	Shrub
180	X	Malephora luteola	Trailing Ice Plant	Ground cover
181	W	Maytenus boaria	Mayten Tree	Tree

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

182	W	Melaleuca nesophila	Pink Melaleuca	Shrub
-----	---	---------------------	----------------	-------

183	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
184	<input type="checkbox"/> *	Mimulus aurantiacus	Monkeyflower	Flower
185	<input type="checkbox"/>	Mirabilis californica	Wishbone Bush	Perennial
186	N	Myoporum debile	ncn	Shrub
187	N	Myoporum insulare	Boobyalla	Shrub
188	W	Myoporum parvifolium	ncn	Ground cover
189	W	Myoporum 'Pacificum'	ncn	Shrub
190	<input type="checkbox"/>	Nassella (=Stipa) lepida	Foothill Needlegrass	Ground cover
191	<input type="checkbox"/>	Nassella (=Stipa) pulchra	Purple Needlegrass	Ground cover
192	<input type="checkbox"/>	Nemophila menziesii	Baby Blue Eyes	Annual
193	X	Nerium oleander	Oleander	Shrub
194	<input type="checkbox"/>	Nolina cismontana	Chaparral Nolina	Shrub
195	N	Nolina bigelovii, or N. interrata	Mexican Grasstree	Shrub
196	W	Oenothera berlandieri	Mexican Evening Primrose	Ground cover
197	N	Oenothera hookeri	California Evening Primrose	Flower
198	W	Oenothera speciosa	Showy Evening Primrose	Perennial
199	X	Ophiopogon japonicus	Mondo Grass	Ground cover
200	<input type="checkbox"/> *	Opuntia littoralis	Prickly Pear	Cactus
201	<input type="checkbox"/> *	Opuntia oricola	Oracle Cactus	Cactus

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

Code	Scientific Name	Common Name	Plant Type
202	<input type="checkbox"/> * Opuntia polifera	Coast Cholla	Cactus

203	W	Osmanthus fragrans	Sweet Olive	Shrub
204	X	Osteospermum fruticosum	Trailing African Daisy	Ground cover
205	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
206	W	Pelargonium peltatum	Ivy Geranium	Ground cover
207	X	Penstemon spectabilis	Beard Tongue	Shrub
208	W	Photinia fraseri	ncn	Shrub
209	W	Pistacia chinensis	Chinese Pistache	Tree
210	X	Pittosporum undulatum	Victorian Box	Tree
211	<input type="checkbox"/>	Plantago erecta	California Plantain	Annual
212	**	Plantago insularis	Woolly Plantain	Annual
214	W <input type="checkbox"/>	Platanus racemosa	California Syoamore	Tree
215	W	Plumbago auriculata	Plumbago Cape	Shrub
216	<input type="checkbox"/>	Populus fremontii	Western Cottonwood	Tree
217	X	Portulacaria afra	Elephant's Food	Shrub
218	<input type="checkbox"/>	Potentilla glandulosa	Sticky Cinquefoil	Subshrub
219	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground cover
220	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
221	<input type="checkbox"/>	Prunus ilicifolia ssp. ilicifolia	Holly Leaved Cherry	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Form
222	X	Prunus lyonil	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	<input type="checkbox"/>	Quercus agrifolia	Coast Live Oak	Tree
227	<input type="checkbox"/> ●*	Quercus berberdifolia	California Scrub Oak	Shrub
228	<input type="checkbox"/> ●*	Quercus dumosa	Coastal Scrub Oak	Shrub
229	X <input type="checkbox"/>	Quercus engelmannii	Engelmann Oak	Tree
230	X	Quercus suber	Cork Oak	Tree
231	X	Rhamnus alaternus	Italian Buckthorn	Shrub
232	<input type="checkbox"/>	Rhamnus californica	California Coffee Berry	Shrub
233	<input type="checkbox"/>	Rhamnus crocea	Redberry	Shrub
234	<input type="checkbox"/>	Rhamnus crocea sp. ilicifolia	Hollyleaf Redberry	Shrub
235	N	Rhaphiolepis species	Indian Hawthorn	Shrub
236	<input type="checkbox"/>	Rhus integrifolia	Lemonade Berry	Shrub
237	N	Rhus lancea	African Sumac	Tree
238	<input type="checkbox"/> ●	Rhus ovata	Sugarbush	Shrub
239	<input type="checkbox"/>	Ribes aureum	Golden Currant	Shrub
240	<input type="checkbox"/>	Ribes indecorum	White Flowering Currant	Shrub
241	<input type="checkbox"/>	Ribes speciosum	Fuchsia Flowering Gooseberry	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
FUEL MODIFICATION ZONE PLANT LIST
July 15, 1997

	Code	Botanical Name	Common Name	Plant Height
242	W	Ribes viburnifolium	Evergreen Currant	Shrub

243	<input type="checkbox"/>	Romneya coulteri	Matilija Poppy	Shrub
244	X	Romneya coulteri 'white cloud'	White Cloud Matilija Poppy	Shrub
245	w <input checked="" type="checkbox"/>	Rosmarinus officinalis	Rosemary	Shrub
246	w <input checked="" type="checkbox"/>	Salvia greggii	Autumn Sage	Shrub
247	w <input checked="" type="checkbox"/>	Salvia sonomensis	Creeping Sage	Ground cover
248	<input type="checkbox"/>	Sambucus mexicana	Mexican Elderberry	Tree
249	W	Santolina chamaecyparissus	Lavender Cotton	Ground cover
250	W	Santolina virens	Green Lavender Cotton	Shrub
251	<input type="checkbox"/>	Satureja chandleri	San Miquel Savory	Perennial
252	<input type="checkbox"/>	Scirpus acutus	Hard-Stem Bulrush	Perennial
253	<input type="checkbox"/>	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	ncn	Ground cover
257	X	Sedum ilineare	ncn	Ground cover
258	X	Sedum x rubrotinctum	Pork and Beans	Ground cover
259	X	Senecio serpens	ncn	Ground cover
260	<input type="checkbox"/>	Sisyrinchium bellum	Blue-Eyed Grass	Ground cover
261	<input type="checkbox"/>	Solanum douglasii	Douglas Nightshade	Shrub

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
 FUEL MODIFICATION ZONE PLANT LIST
 July 15, 1997

Code	Botanical Name	Common Name	Plant Height
------	----------------	-------------	--------------

262	<input type="checkbox"/>	<i>Solanum xantii</i>	Purple Nightshade	Perennial
263	W	<i>Stenocarpus sinuatus</i>	Firewheel Tree	Tree
264	W	<i>Strelitzia nicolai</i>	Giant Bird of Paradise	Perennial
265	W	<i>Strelitzia reginae</i>	Bird of Paradise	Perennial
266	<input type="checkbox"/>	<i>Symphoricarpos mollis</i>	Creeping Snowberry	Shrub
267	W	<i>Tecoma stans</i> (<i>Stenolobium stans</i>)	Yellow Bells	Shrub/Small tree
268	X	<i>Tecomaria capensis</i>	Cape Honeysuckle	Ground cover
269	N	<i>Teucrium chamaedrys</i>	Germander	Ground cover
270	N	<i>Thymus serpyllum</i>	Lemon Thyme	Ground cover
271	N	<i>Trachelospermum jasminoides</i>	Star Jasmine	Shrub
272	<input type="checkbox"/>	<i>Trichostema lanatum</i>	Woolly Blue-Curis	Shrub
273	X	<i>Trifolium hirtum</i> 'Hyron'	Hyron Rose Clover	Ground cover
274	X	<i>Trifolium fragiferum</i> 'O'Connor's'	O'Connor's Legume	Ground cover
275	<input type="checkbox"/>	<i>Umbellularia californica</i>	California Laurel	Tree
276	<input type="checkbox"/>	<i>Verbena lasiostachys</i>	Western Vervain	Perennial
277	N	<i>Verbena peruviana</i>	ncn	Ground cover
278	X	<i>Verbena species</i>	Verbena	Ground cover
280	<input type="checkbox"/>	<i>Vitis girdiana</i>	Desert Wild Grape	Vine
281	X	<i>Vulpia myuros</i> 'Zorro'	Zorro Annual Fescue	Grass

SAN DIEGO COUNTY FIRE CHIEF'S ASSOCIATION
 FUEL MODIFICATION ZONE PLANT LIST
 July 15, 1997

Code	Botanical Name	Common Name	Plant Form
------	----------------	-------------	------------

282	W	Westringia fruticosa		Shrub
283	W	Xanthorrhoea species	Grass Tree	Perennial accent /Shrub
284	W	Xylosma congestum	Shiny Xylosma	Shrub
285	X	Yucca species	Yucca	Shrub
286	<input type="checkbox"/>	Yucca whipplei	Yucca	Shrub

- X = Plant species prohibited in fuel modification zones adjacent to reserve lands. Acceptable on all other fuel modification locations and zones.
- W = Plant species appropriate for use in irrigated portions of fuel modification zones adjacent to reserve lands. Acceptable in all other fuel modification locations and zones.
- = Plant species native to San Diego County. Acceptable in all fuel modification zones in all locations.
- N = Plant species acceptable on a limited basis (maximum 30% of the area at time of planting) in irrigated portions of fuel modification zones adjacent to reserve lands. Acceptable in all other fuel modification locations and zones.
- * = If locally collected.
- ** = Not native but can be used in all zones.
- = Plant species acceptable on a limited use basis. Refer to qualification requirements following plant palette.

UNDESIRABLE PLANTS AND WEEDS

Within Fuel Modification Zone

BOTANIC NAME

Adenostoma fasciculatum

Adenostoma sparsifolium

COMMON NAME

Chamise

Red Shanks

Anthemix cotula
Artemisia californica
Arundo Donax
Brassica rapa
Brassica nigra
Cardaria draba
Cirsium vulgare
Conyza canadensis
Cortaderia seloana
Cytisus Spp.
Eriogonum fasciculatum
Heterotheca grandiflora
Lactuca serriola
Nicotiana bigelovii
Nicotiana glauca
Salsola australis
Salvia mellifera
Silybum marianum
Tamarix Spp.
Urtica urens

Mayweed
California Sagebrush
Giant Cane
Wild Turnip, Yellow Mustard, Field
Black Mustard
Hoary Cress, Perennial Peppergrass
Wild Artichoke
Horseweed
Pampas Grass
Scotch Broom, French Broom, etc.
Common Buckwheat
Telegraph plant
Prickly Lettuce
Indian Tobacco
Tree Tobacco
Russian Thistle or Tumbleweed
Black Sage
Milk Thistle
Tamarisk
Burning Nettle
Most species of Eucalyptus