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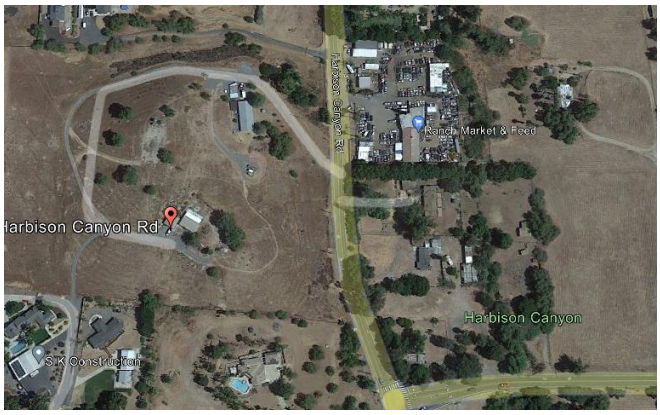
FIRE PROTECTION PLAN



HARBISON CANYON TPM

2030 HARBISON CANYON ROAD, EL CAJON, CA 92019

PROJECT NUMBERS: PDS2022-TPM-21316; PDS2022-ER-21-14-001

APN 513-101-11-00

APPLICANT: NAGHAM SABAH HAKEEM & RAGEED ARMANY

1233 PFEIFER LANE, EL CAJON, CA 92020

Prepared for the County of San Diego

by

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SECTION 1
INTRODUCTION

This Fire Protection Plan (FPP) has been prepared for the Harbison Canyon TPM-21316 Lot Division, located at 2030 Harbison Canyon Road, El Cajon, CA.

The purpose of the FPP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts.

As part of the assessment, the Plan has considered the property location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management.

The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends methods of treatments that will protect one or more at-risk communities and essential infrastructures.

The Plan recommends measures that property owners will take to reduce the probability of ignition of structures throughout the area addressed by the Plan.

1.1 Project Location, Description and Environmental Setting

1.1.1 Project Location

The Project Site is in the unincorporated eastern San Diego County. The geographic coordinates are 32*-43'-42" -N x 116*-47'-53" West. The existing parcel is identified as San Diego County APN 513-101-11-00.

Further geographical description of the Project Site is:

- 23.86 miles east of the Pacific Ocean
- 16.21 miles north of U.S/Mexico International Border
- 5.36 miles east of the central business district of the City of El Cajon

The Project Site is in the Crest-Dehesa Planning Group jurisdictional area.

1.1.2 Project Description

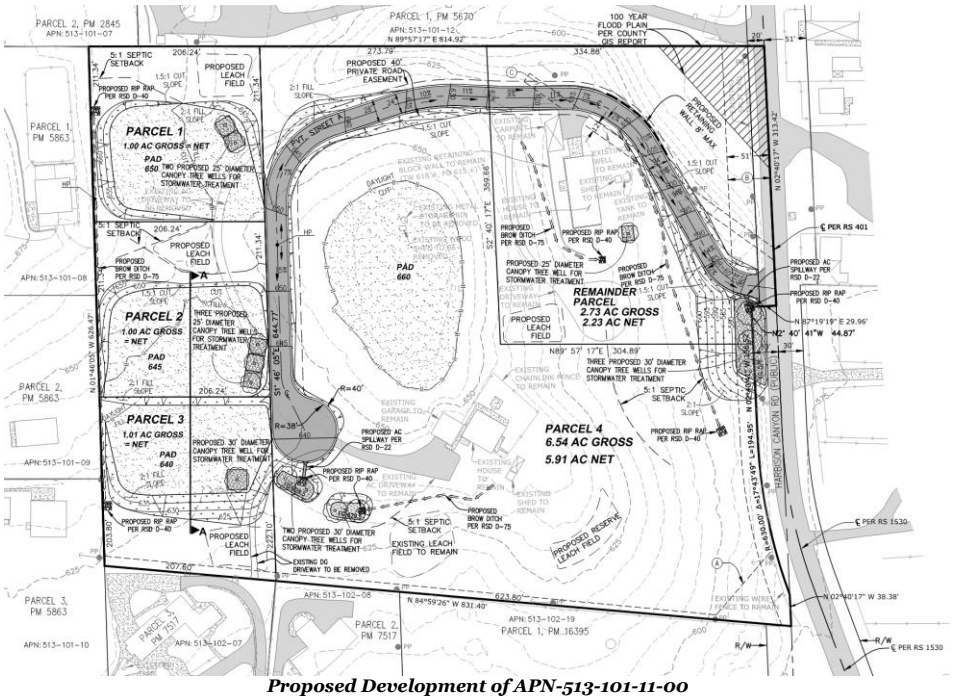
The Project has been assigned the following County of San Diego development permit: PDS2022-TPM -21316.

PDS 2022-TPM-21316 proposes to subdivide an existing 12.37-acre parcel into four (4) single family lots with one (1) Remainder Parcel. There is one (1) existing single-family

dwelling on Parcel 4 and another existing single-family dwelling on the Remainder Parcel.

- Parcel 1 – 1 acre
- Parcel 2 – 1 acre
- Parcel 3 – 1.01 acres
- Parcel 4 – 6.54 acres
- Remainder Parcel – 2.73 acres

The Project Site is designated for SR-1 Semi-Rural Land Use and is zoned A-72 for General Agriculture.



Proposed Development of APN-513-101-11-00

1.1.2.1 Proposed Project Use

When developed, the Project will provide parcels for future construction of single-family dwellings, with existing single-family dwellings on Parcel 4 and the Remainder parcel.

When developed, the divided parcels will provide an in-filling project that mitigates existing exposures created by native and non-native vegetation species.

1.1.3 Location of Easements

The following easements have been recorded on the Project Site:

- SDG&E Public Utility Easements, document recorded March 30, 1953, in Book 4791, Page 23
- Forty-foot-wide San Diego County Roadway Easement, document recorded August 16, 1972, in Document 1972-216628
- Twelve-foot-wide Public Utility Easement recorded February 20, 1973, as Document # 1973-044103.
- SDG&E Easement recorded June 6. 1940 in Book `1033, Page 302 Book 2
- Twenty-five foot wide Unnamed Easement recorded June 13, 1946, in Book 2153, page 78.

1.1.4 – Open Space and Riparian Areas

Mapping of the undeveloped Project Site does not identify existing Open Space Easements or Riparian Areas.

The County of San Diego Scoping Document indicates there *may* be sensitive resources on the Project Site that require mitigation(s). The document also indicates that portions of the Site may have jurisdictional waters that may be protected by the County Resource Protection Ordinance (RPO).

If there is an RPO wetland on the Project Site, it will require an appropriate wetlands buffer, measuring between fifty (50') and 200 feet wide, depending on the identified resources.

1.1.5 – Off-Site Improvements

There are seven (7) existing and developed single-family dwelling parcels located outside of the Project Site, along the Project Site's western, southern, and northern perimeter boundaries.

1.1.5.1 – Roads

Harbison Canyon Road, a two-lane, paved, publicly maintained road with a south-to-north configuration, is located immediately adjacent to the Project Site's eastern property boundary line. Harbison Canyon Road has a forty (40') foot wide easement, with an improved paved width of twenty-four (24) feet. The roadway corridor does not provide off-street parking.

Harbison Canyon Road Right-of-Way Corridor South of Project Site

1.1.5.2 – Utilities

1.1.5.2.1 Fuel Gases

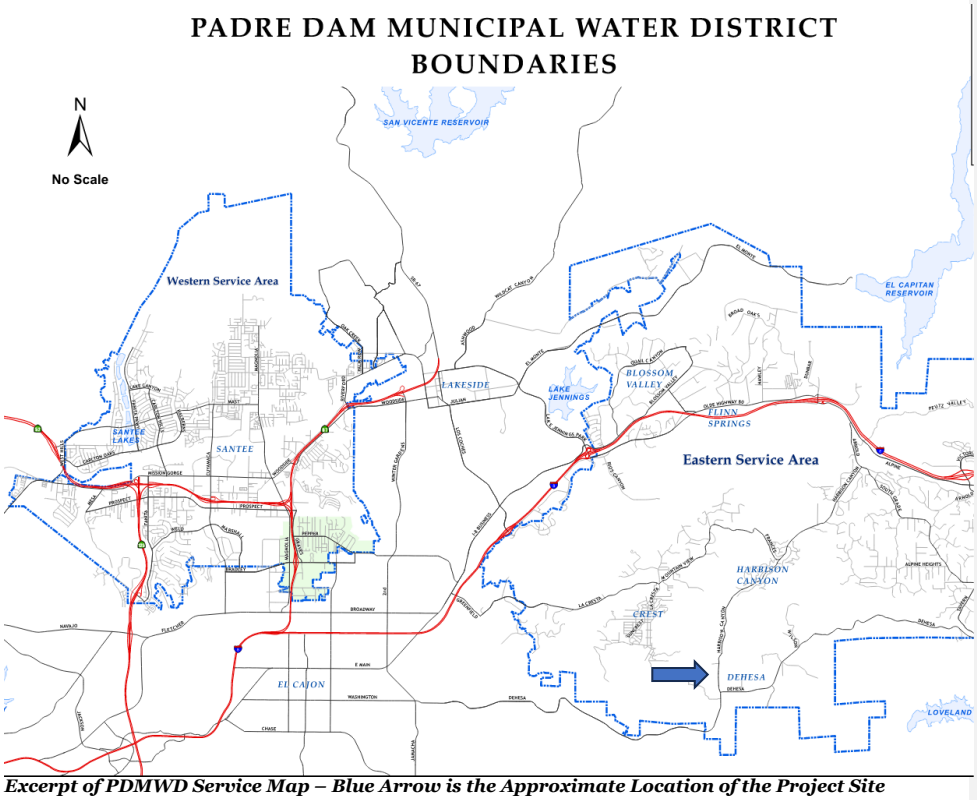
The Project is serviced by private LP gas vendors.

1.1.5.2.2 Electrical Utility

The Project Site's electrical utilities are served by Sempra Energy-SDGE.

1.1.5.2.3 Water Utilities

The Project Site is inside the jurisdictional boundaries of the Padre Dam Municipal Water District. The Project Site is in Padre Dam's Eastern Service Area.



Excerpt of PDMWD Service Map – Blue Arrow is the Approximate Location of the Project Site

1.1.5.2.4 Telephonic Utilities

Telephone utilities on the Project Site are provided as determined by individual property owner selections.

1.1.5.2.5 Sewage/Sanitary Disposal

Sewage disposal will be provided by individually owned and maintained septic systems on each existing/proposed parcel.

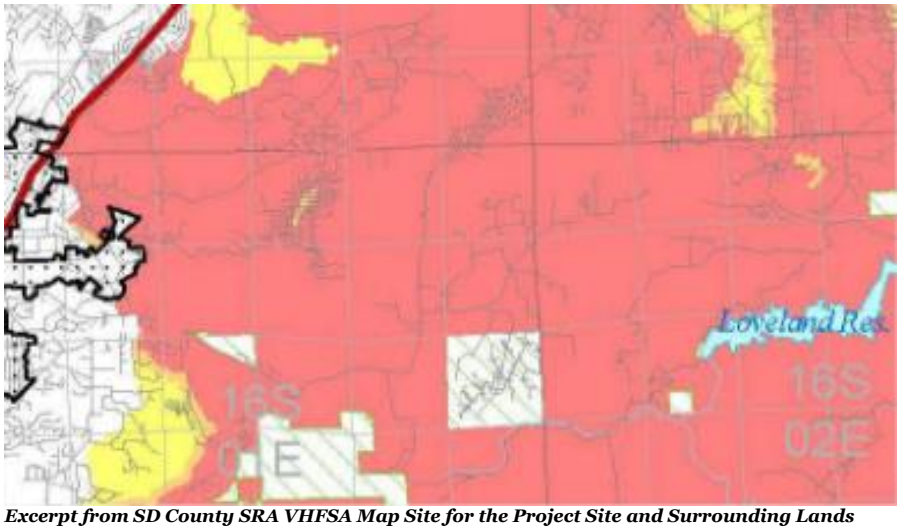
1.1.3 Environmental Setting

1.1.3.1 Dates of Site Inspections/Visits

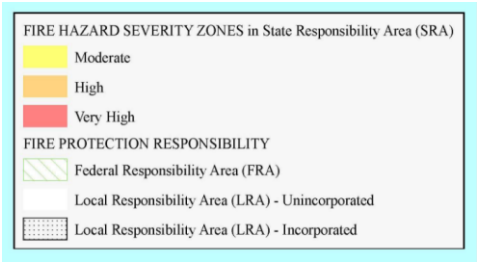
A site visit was conducted by the Consultant on November 26, 2023.

1.1.3.2 Fire Severity Area

Analysis of the San Diego County CAL-FIRE FRAP Very High Fire Severity Area (VHFSA) map shows that the Project Site is in a State Responsibility Area (SRA) in a designated VHFSA location.



Excerpt from SD County SRA VHFSA Map Site for the Project Site and Surrounding Lands



1.1.3.3 Topography

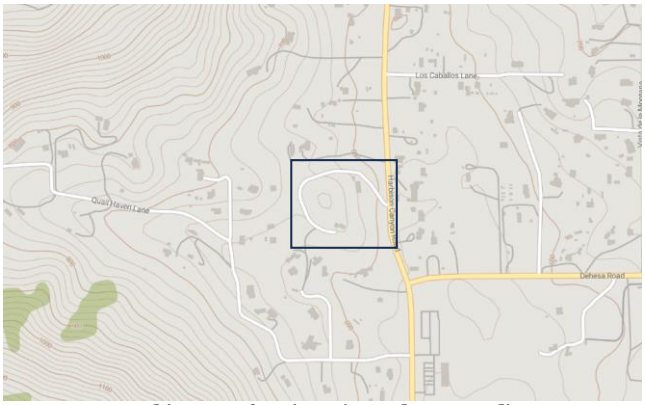
The Project Site is at the southern end of the Harbison Canyon Drainage and north of the Dehesa Valley plain and drainages.

The Harbison Canyon drainage, which has a south-to-north configuration, is approximately 0.80 miles (4224 feet) wide near the Project Site. Approximately 0.40 miles (2112 feet) north of the Project, the canyon narrows significantly, to an average width of 1100 feet> The width of the canyon further diminishes when one continues traveling up-canyon in a northerly direction.

West and southwest of the Project Site, the topography rapidly evolves into steep mountain slopes that rise towards the unincorporated community of Crest. The mountain sides have numerous drainages and canyons.

Typical Mountains/Slopes West and North of the Project Site

Typical Mountains Southwest of Project Site



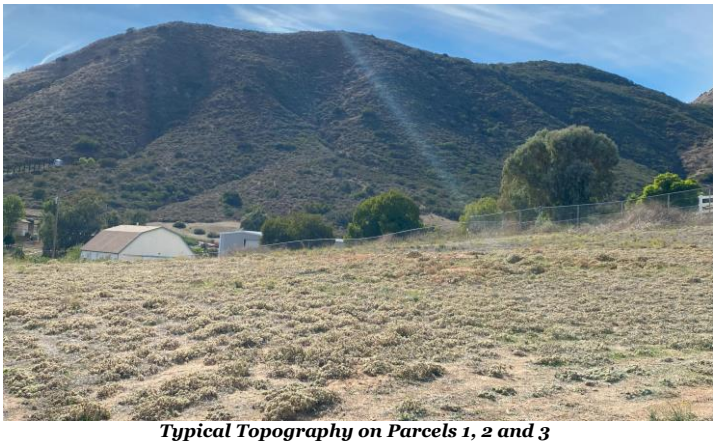
Topographic Map of Project Site and Surrounding Area

A slope analysis of the Project Site indicates it has gradients ranging between 12 and 32%.

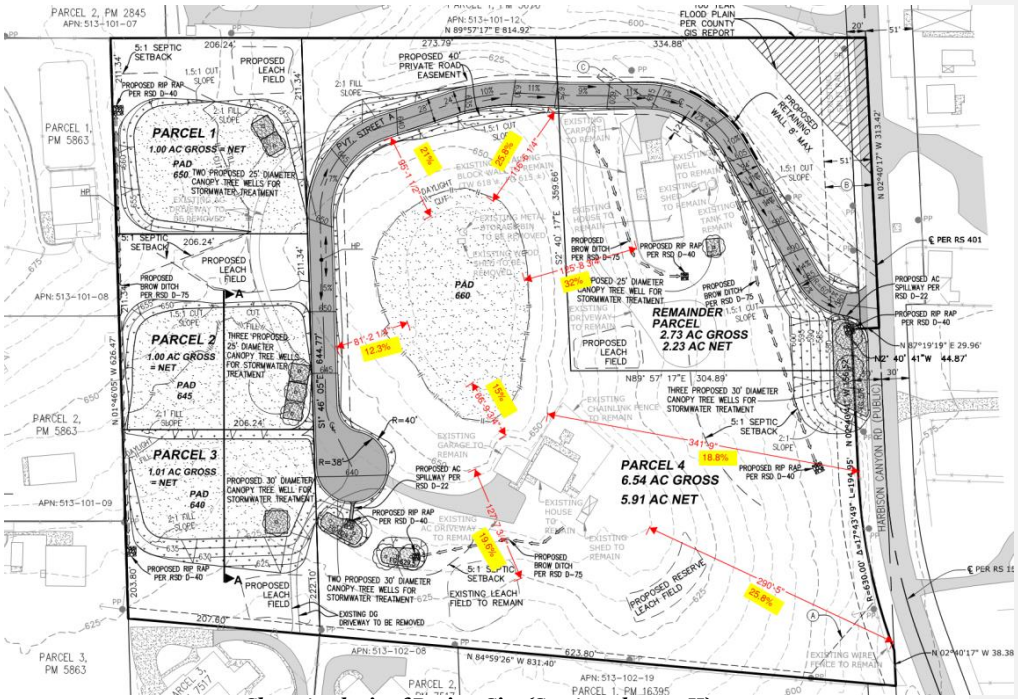
The steepest gradient (32%) is between the existing single-family dwelling on the Remainder Lot and the dome-shaped knoll at the center of the undivided parcel. The slopes on Parcel 4 at the southeast corner of the Project Site exhibit moderate steepness, with gradients ranging between 18.8 and 25.8%.

Slopes on Parcel 4, Southeast Corner of Project Site, Looking Northwest

The western portion of the Project Site, where Parcels 1 through 3 will be developed, is relatively flat.



Typical Topography on Parcels 1, 2 and 3



Slope Analysis of Project Site (See Attachment H)

1.1.3.4 Vegetation

The predominate vegetation on the Project Site is annual native and non-native grass species. There are several shrub and tree species present. Tree species include pepper trees, oaks, palms, and pines.

1.1.3.4.1 General Description of Identified Vegetation Types

1.1.3.4.1.1 Grass Fuel Type Models (GR)

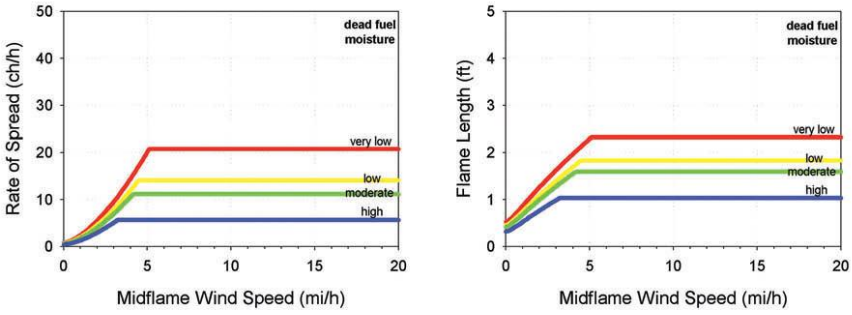
The primary carrier of fire in the GR fuel models is grass. Grass fuels can vary from heavily grazed stubble or sparse natural grass to dense grass more than six (6) feet tall. Fire behavior varies from moderate spread rate and low flame lengths in the sparse grass to extreme spread rate and flame lengths in tall grass models. All GR fuels are dynamic, meaning that their live herbaceous fuel load shifts with live to dead as a function of live moisture content. The effect of live moisture content on spread rate and intensity is strong.

1.1.3.4.1.1.1 GR-1 Short, Sparse Dry Climate Grass

The primary carrier of fire in the GR1 Fuel Model is sparse grass, though small amounts of fine dead fuel may be present. The vegetation in the GR-1 Fuel Model is short, either naturally or by grazing, and may be sparse and discontinuous.

The 15% moisture level of extinction (dead fuel load) is indicative of a dry climate fuel. Fuel Model GR-1 is also applied to high extinction fuel beds because predicted spread rates and flame length are lower when compared to other GR Fuel Models. Fine fuel loading is 0.4 tons per acre.

Fuel Model GR-1, Dry Climate Sparse Grass of Proposed Parcels 1, 2 and 3

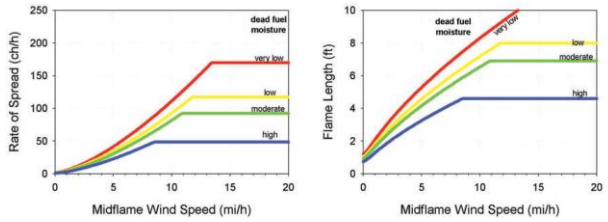


1.1.4.1.1.2 GR-2 Low Load, Dry Climate Grass

The primary carrier fire in GR-2 is grass, though small amounts of fine dead fuels may be present. Fuel loading is greater than GR-1 Grasses, and the fuel bed may be more

continuous. Shrubs, if present, do not impact fire behavior. The fuel load is an average of one (1) ton per acre and the extinction moisture content is 15%.

Fuel Model GR-2 Dry Climate Moderate Lod Grass



1.1.3.5 Fire History

The entire Project Site was burned over during the 1970 Laguna Fire.

The Project Site had limited exposure to fire behavior associated with the 2003 Cedar Fire. Historical aerial photography indicates burn scarring on the mountainsides west,

northwest, southwest and east of the Project Site with minimal flame front intrusion into developed residential lots near the Project.

2004 Aerial Image of the Project Site and Surrounding Lands, Post Cedar Fire Event

On July 13, 2022, a vegetation fire was reported at 1913 Harbison Canyon Road. The fire burned an estimated thirty-seven (37) acres. It was approximately 800 feet north of the Project Site on the east side of the Harbison Canyon right-of-way corridor.

July 13, 2022, Harbison Fire

1.1.3.6 Climate

Like most of Southern California, San Diego County and the project site has a Mediterranean Climate typified by warm to hot dry summers and mild to cool winters.

Summer temperatures range between the mid-nineties and low one hundreds during the summer and fall months with occasional extraordinarily hot, dry spells like desert conditions occurring.

Rainfall averages nine to fifteen inches at the lower elevations where the project site is located.

Santa Ana winds are one of the most notable weather conditions in Southern California and San Diego County. Typically, these dry winds occur during the late summer and fall months (September through November) but may occur any time during the year. With combined adiabatic (compression) heating (for every 1000 feet of elevation decline, temperature increases five degrees) and wind velocities exceeding 40 miles per hour, Santa Ana winds can, and do, severely exacerbate wildfires, especially during drought conditions.

The U.S. Forest Service Weather Information Management System provides information about weather patterns in San Diego County.

Daily afternoon weather observations in San Diego County were analyzed for forty-four years (1961-2005) at selected fire stations. San Diego County is divided into five climate zones between the coast and desert. Weather data between April and December are used to represent the annual fire season in San Diego County, with the most severe fire weather conditions in September and October. The following table was derived by the analysis of San Diego County's Interior Climate Zone where the project is located.

Worst Case Weather and Burning Conditions, Interior Zone

Period	Temperature	Humidity	Wind Speed	Burning Index
Summer	90-109	5-9%	18 mph	153
Santa Ana	90-109	5-9%	24 mph	168
Peak	90-109	5-9%	56 mph	-

SECTION 2
GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

2.1 Emergency Services – Availability and Travel Time

2.1.1 Emergency Services Availability

The Project is in the sphere of influence and boundaries of the San Diego County Fire Protection District. The District is an "all-risk" agency, supplying 24-7-365 fire protection services to an area of more than 1500 square miles.

The District was formed in 2008 to unify the administrative support, communications, and operation of fifteen rural fire agencies and to extend around-the-clock protection to 1.5 million acres the unincorporated County. The District currently has a high level of service using an Integrated Cooperative Regional Fire Protection System. It delivers fire protection and emergency services to over forty communities, using thirty-five fire stations and 500+ responders.

The Insurance Services Office (ISO) recently evaluated the District. After a comprehensive process, ISO issued the District a Fire Protection 3/3X Classification. The classification indicates that the District is ranked among the top twenty per cent of fire departments in the United States for its capabilities of fighting building fires.

The District uses the following types and numbers of fire apparatus:

Quantity	Apparatus Type
26	Structural Engines
7	Wildland Engines
12	Type VI Patrols
2	Trucks
4	Urban Search & Rescues
14	Water Tenders
10	Command Vehicles

2.1.1.1 – Fire Station Locations

The closest paid-staff District facility is Fire Station 24 in Harbison Canyon. Station 24 is located at 551 Harbison Canyon Road. This station is staffed twenty-four (24) hours per day with career firefighters and is approximately 2.8 miles from the Project site.

San Diego County FPD Station 24

2.1.2 – Travel Time

The estimated response travel time from Station 24 to the Project site is 3-1/2 minutes at a constant driving speed of 50 miles per hour.

Using the NFPA 1142 response time formula method, and assuming a constant 35 miles per hour travel speed, the estimated fire apparatus response time from Station 24 to the project site is approximately five (5) minutes (*4.7 minutes).*

Using the trip calculator available from www.mapquest.com website, response time from Station 24 to the Project Site is five (5) minutes.

The next closest, paid status fire stations to the Project Site are:

- Sycuan Fire Station, two miles. Travel Time is seven (7) minutes.
- San Miguel FPD Station 23, 4.6 miles. Travel time is seven (7) minutes.
- CAL-FIRE Monte Vista Headquarters, eight (8) miles. Travel time is twelve (12) minutes.
- FS 23 – CAL-FIRE Flynn Springs, 9 miles. Travel Time is sixteen (16) minutes.
- SDCFA Headquarters, Jamul Station 36, 13 miles; travel time is eighteen (18) minutes.

Table S-1, Travel Time Standards, from the County of San Diego General Plan's Safety Element indicates that a maximum response time of ten (10) minutes is allowed for Single Family Dwellings in Land Use Designations SR-1, Semi-Rural Residential Areas.

Table S-1 Travel Time Standards from the Closest Fire Station*

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	■ Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1) ■ Commercial and Industrial Designations in the Village Regional Category ■ Development located within a Village Boundary	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	■ Semi-Rural Residential Areas (> SR-1 and SR-2 and SR-4) ■ Commercial and Industrial Designations in the Semi-Rural Regional Category ■ Development located within a Rural Village Boundary	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	■ Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) ■ *All* Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low-density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.

The County of San Diego General Plan specifies a maximum response time of ten (10) minutes for Semi-Rural Zoning and twenty (20) minutes for Rural Zoning.

Finding: *The Project has compliance with the General Plan's Emergency Response Time criteria.*

2.1.3 Fire Response Dispatch Patterns

The Project Site is located on lands designated by the CAL-FIRE Fire and Resource Assessment Program as a Very High Fire Severity Area (VHSFA). It is also in lands designated as State Responsibility Area (SRA), in which CAL-FIRE has primary responsibility for suppressing wildfire incidents.

CAL-FIRE Vegetation Fire Responses

Low Wildland – Two (2) Type III engines, one (1) Battalion Chief

Medium Wildland – Four (4) Type III engines, one (1) BC, one (1) bulldozer, two (2) hand crews, two (2) helicopters, one (1) air attack, two (2) air tankers

High Wildland – six (6) Type III engines, one (1) BC, two (2) dozers, four (4) hand crews, three (3) helicopters, one (1) air attack, three (3) air tankers

NOTE: These are basic response levels. Response levels are subject to change based on anticipated weather and fire behavior conditions, staffing patterns for unusual events, and State-wide resource commitments.

2.2 Emergency Access and Evacuation

2.2.1 Fire Department Access to the Project Site

San Diego County Fire Protection District apparatus responding from SDCFA Station 24 will be the first arriving fire suppression company.

The engine company assigned to Station 24 will proceed southbound on Harbison Canyon Road until reaching the existing driveway leading into the Project Site. This driveway will be replaced by an approved private road with a paved all-weather paved driving surface. The private road intersection with Harbison Canyon Road is on the west shoulder of the right-of-way corridor. Upon reaching the driveway/private road, the apparatus will turn west/right on to the private road and proceed to the buildings needing emergency assistance.

2.2.2 On-Site Road System

The existing driveway serves two (2)single-family dwellings. The driveway has an improved width with an average of fifteen (15') feet wide. Ten feet of the driveway is

paved with asphalt (on the southern portion) and five (5') feet of graded decomposed granite (on the northern side).

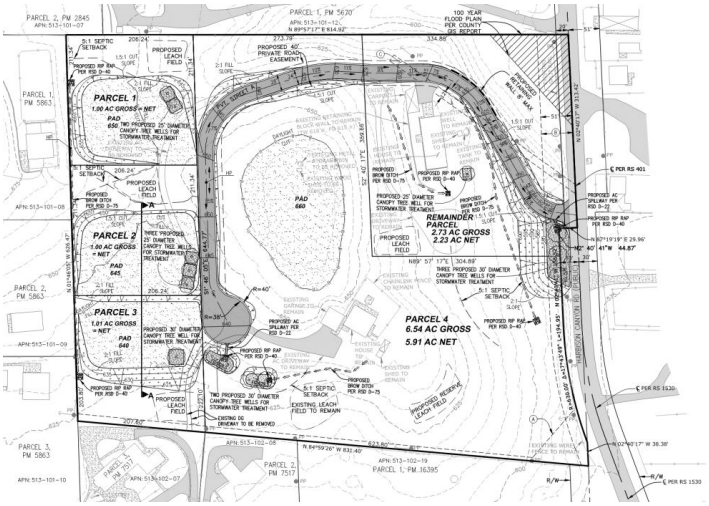
The private, to-be-named road has a proposed maximum length between Harbison Canyon Road and the cul-de-sac bulb entrance that measures 970 feet. The road will have a forty (40') foot wide easement and a paved improved width of twenty-four (24) feet. The roadway initially has an east-to-west configuration from the intersection before turning ninety (90*) degrees and becoming a north-to-south right of way corridor.

2.2.2.1 Access to Proposed Individual Parcels

Parcels 1, 2 and 3 will be on the west side of the to-be-name Street "A" roadway right-of-way corridor.

All proposed parcels have a maximum width of approximately 200 feet. As such, private driveways serving individual lots will not exceed the maximum dead-end driveway length of 150 feet and will not require installation of approved fire department turn-arounds. Exact building locations on individual parcels have not been determined in the early phase of TPM planning.

All driveways will have a minimum sixteen (16') foot wide improved paved driving surface capable of supporting the minimum imposed load of a 75,000 lb. fire apparatus.



Proposed Roadway System

2.2.2.2 Access to Existing Parcel # 4

There is an existing single-family residence on Parcel # 4.

The existing, pre-development access road has an all-weather driving surface along its entire length, terminating in an existing and reasonably compliant fire department turnaround.

Existing Project Site Roadway System

Development of the Project Site will modify access to Parcel # 4.

The existing driveway will be replaced with a forty (40') wide road easement and the twenty-four (24') foot wide to-be-named Street "A" roadway corridor. At the south end of Street "A," a terminal cul-de-sac bulb will be installed. The east side of the cul-de-sac bulb will connect with the existing paved driveway serving Parcel # 4 with no additional modifications.

Existing & Proposed Access Road Systems Serving Parcel # 4

2.2.2.3 Access to Remainder Parcel

There is an existing single-family residence on the proposed Remainder Parcel.

The existing access road has an all-weather driving surface along the north side of the Remainder Parcel.

The existing single-family dwelling has a driveway on its north side that is Code compliant.

Finding: *With its limited length, the Remainder Parcel will not require installation of a fire department turnaround feature*.

Finding: *The private driveway exceeds the minimum sixteen (16') foot width for a residential driveway serving one building*.

There is a semi-cul-de-sac shaped feature on the north side of the pre-development access road, opposite the driveway to the Remainder Parcel.

Existing and Proposed Remainder Parcel Road Access, Looking South

2.2.3 Maximum Road Length

Section 503.2.5.1 of the County Consolidated Fire Code places maximum length limitations on dead-end roads.

The maximum length of a dead-end road, including all dead-end roads accessed from that dead-end road, shall not exceed the cumulative lengths, regardless of the number of parcels served, prescribed by Table 503.4.5.1:

TABLE 503.2.5.1
DEAD-END ROADS - MAXIMUM LENGTH
(Title 14 SRA 1273.09 Ref.)

Zoning for Parcel(s) Served by Dead-End Road	Cumulative Length of Dead-End Road(s) (Feet)
Less than 1 acre	800
1 acre to 4.99 acres	1,320
5 acres to 19.99 acres	2,640
20 acres or larger	5,280

All lengths shall be measured from the edge of the roadway surface at the intersection where the road begins to the end of the road surface at its farthest point.

Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply.

Each dead-end road shall have a turnaround approved by the fire code official and constructed at its terminus. A Turnaround shall be provided to all building sites on driveways over 150 feet in length and shall be within fifty (50) feet of the building.

2.2.4 Evacuation Routes From the Project Site

Residents of the Project Site have several evacuation options in the event of wildfires or other emergencies.

Residents will initially egress along the to-be-named street proposed for the Project Site. At the Harbison Canyon Road intersection, residents will be provided with two separate directions of egress travel away from the Project Site. Residents may either turn north or south on Harbison Canyon Road.

2.2.4.1 Evacuation Route Options to the North and West

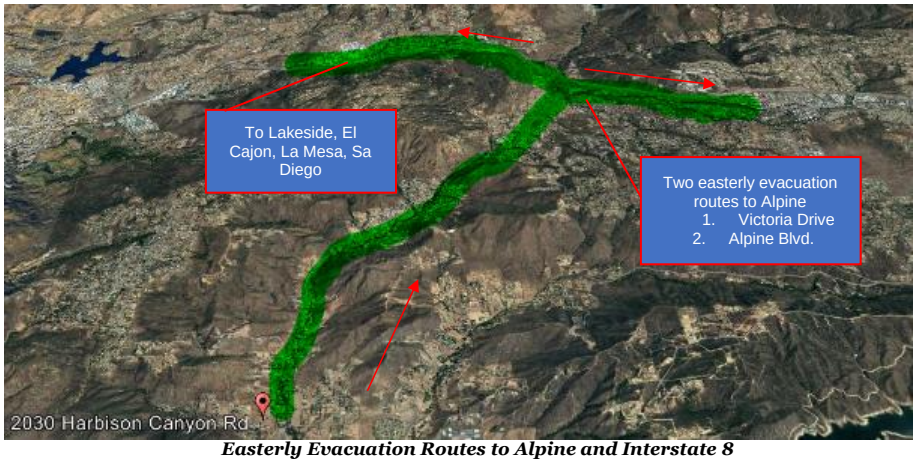
Turning left on Harbison Canyon Road, residents have the option of
Traveling toward the community of Alpine.

The next intersection they will reach with two alternative directions of travel will be Frances Drive. This intersection is approximately 950 feet north of Fire Station 24.

Turning left on Frances Drive, residents will proceed in a westerly direction to Mountain View Drive. Mountain View Drive continues in a western direction to the community of Crest. At the intersection of Mountain View Drive and La Cresta Road, residents will turn right on to La Cresta Road. La Cresta Road will direct residents towards the City of El Cajon and other western communities.

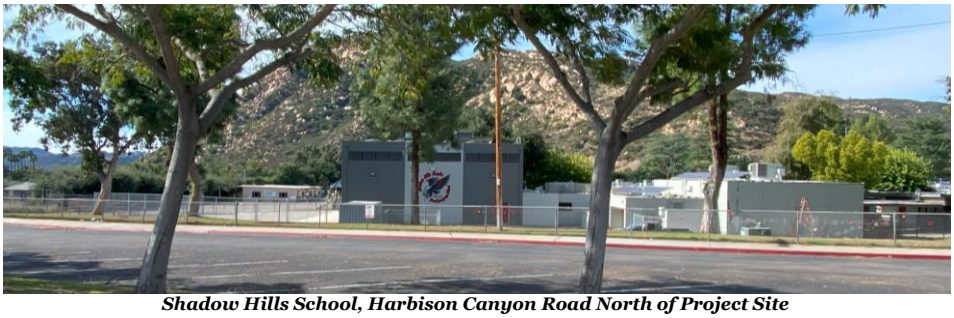
Evacuation Route Through Crest to El Cajon

If residents elect to bypass Frances Drive and Mountain View Road, they can continue northbound on Harbison Canyon Road to its intersection with Victoria Drive. At this intersection, they are given two additional separate evacuation routes out of the area. They can either turn right and continue east to the community of Alpine, with pre-established community safe zones and an evacuation center; or turn left and proceed westerly to Alpine Blvd.



Easterly Evacuation Routes to Alpine and Interstate 8

NOTE – Shadow Hills School, located on the west side of Harbison Canyon Road prior to the Harbison Canyon Road and Victoria Drive intersection, is a designated community evacuation shelter for the Alpine community.



Shadow Hills School, Harbison Canyon Road North of Project Site

At the intersection of Alpine Blvd and Victoria Drive, two alternative directions of travel are provided. Turning left (west) on to Alpine Blvd., residents can proceed towards Lakeside, El Cajon, La Mesa, and San Diego. Turning right (east), they can proceed along an alternative route to the community of Alpine.

NOTE: If a fire threatening the project site is to the northeast, or in the Alpine and upper Harbison Canyon drainage, evacuating northbound on Harbison Canyon Road is NOT recommended because of anticipated fire behavior and the potential for entrapment on the northerly evacuation roadways.

2.2.4.2 Dehesa Road and Southerly Evacuation Routes

By turning right (south) on Harbison Canyon, residents will travel downhill to the intersection of Harbison Canyon and Dehesa Roads, a distance of approximately 900 feet. Two alternative evacuation travel directions are provided at this location.

Southbound Dehesa Road – Evacuation Route towards the City of El Cajon

Turning right (west), residents will follow Dehesa Road through Dehesa Valley to the City of El Cajon, or to other communities further to the west.

Turning left (east), residents can travel approximately one mile and will reach the Sycuan Casino complex, which can provide an evacuation center and community safe zone on the premises. The Casino Complex is surrounded by a significant fuel modified expanse of land and provides a large amount of indoor and outdoor parking. The outdoor parking lots provide additional areas of fuel-modified and fuel-barren lands of defensible space.

Evacuation Route from Project Site to Sycuan Resort

2.2.4.3 – Alpine Community Shelters and Evacuation Centers

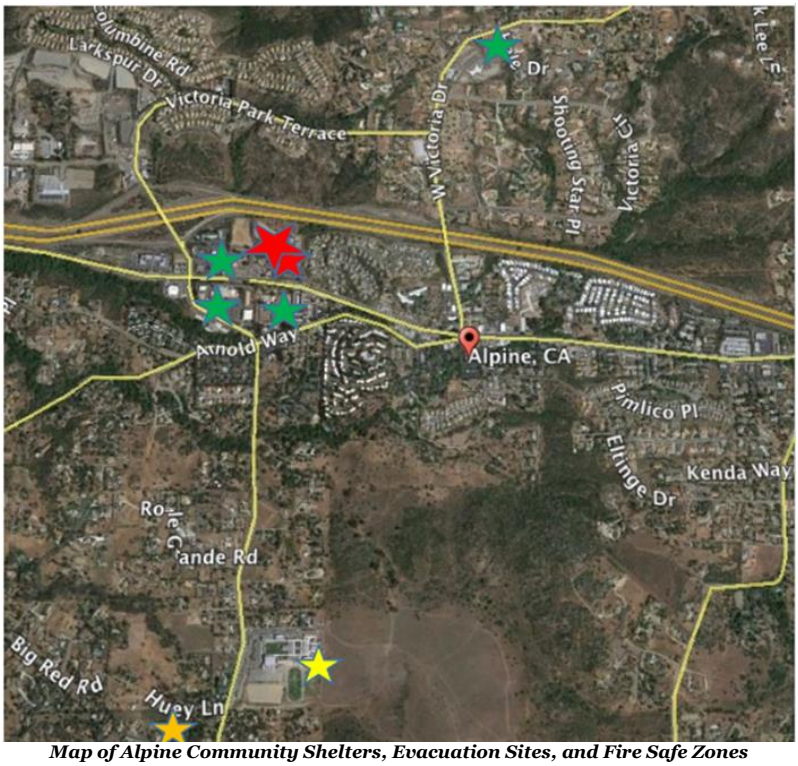
If evacuating northbound on Harbison Canyon Road, residents may elect to use the shelters, evacuation center or community fire safe zones located in Alpine.

2.2.4.3.1 Shelters - Alpine has four primary shelters and an evacuation site available, with planned Red Cross assistance.

Primary Shelters:

- Alpine Elementary School, 1850 Alpine Boulevard (RED side-by-side stars)
- Shadow Hills Elementary School, 8770 Harbison Canyon Road
- Joan MacQueen Middle School, 2001 Tavern Road (YELLOW star)
- Boulder Oaks Elementary School, 2320 Tavern Road (ORANGE star)

2.2.4.3.2 Evacuation Site – The Evacuation Site is designated at the Alpine Community Center, located at 1830 Alpine Boulevard (RED side-by-side stars)



Map of Alpine Community Shelters, Evacuation Sites, and Fire Safe Zones

2.2.4.3.3 Fire Safe Zones

If it is impossible to evacuate from the Alpine area because of traffic congestion on the roads, all the above locations can serve as Fire Safe Zones.

2.2.4.3.4. Emergency Services

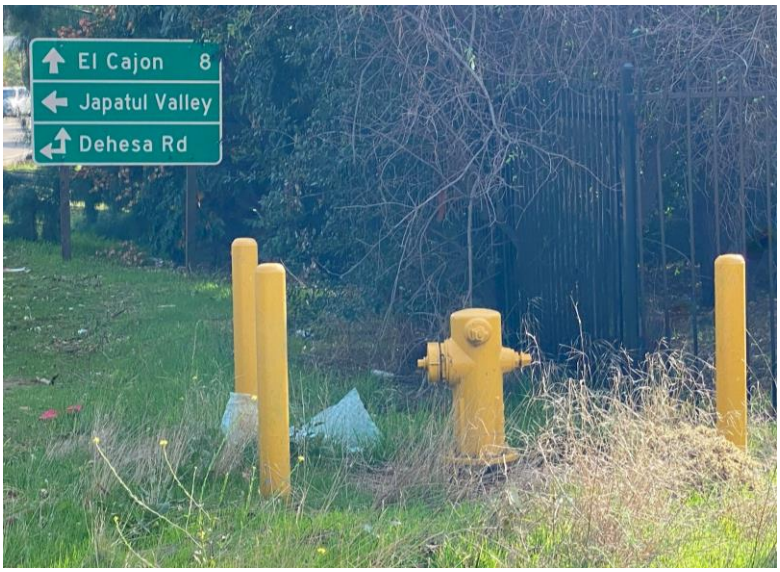
The Red Cross has been contracted to provide emergency services at all these locations as and when they are needed.

2.3. Existing Water Supply

The Project Site is in the Eastern Service Area of the Padre Dam Municipal Water District.

The District has an existing water main, and several fire hydrants installed along Harbison Canyon Road in the vicinity of the Project Site.

There is a residential style fire hydrant with one 2-1/2" and one 4" port approximately 360 feet south of the Project Site's existing driveway.



A second residential style fire hydrant is located ninety-five (95') feet northeast of the intersection of Harbison Canyon Road and the existing driveway/to-be-named private street. The hydrant is on the east side of the Harbison Canyon right-of-way corridor and serves the Ranch Market and Feed site.

A third residential fire hydrant is located at 1553 Harbison Canyon Road, approximately 500 feet north of the Project Site.

2.4 Fire Sprinkler Systems

There are two existing single-family dwelling buildings on the Project Site. Neither of the existing dwellings have automatic fire sprinkler systems installed.

All new and future buildings will have automatic fire sprinkler systems compliant with NFPA Pamphlet 13-D for residential fire sprinklers in one- and two-family dwellings installed as required by the most current edition of the FPD ordinances and San Diego County Consolidated Fire Code.

2.5 Ignition Resistant Construction

There are two existing buildings or structures on the proposed Project Site.

Existing Single-Family Dwelling, 2030 Harbison Canyon Road, Remainder Lot

Existing Single-Family Dwelling on Proposed Parcel # 4

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas.

2.6 Defensible Space, Ornamental Landscaping and Vegetation Management

There are two existing structures and buildings on the proposed Project Site.

Defensible Space, Vegetation Management and Ornamental Landscaping are regulated by provisions found in the County of San Diego Consolidated Fire Code, California Fire Code, International Wildland Urban Interface Code, California Public Resources Code, California Health and Safety Code and the California Government Code. Buildings and structures erected in brush covered lands are required to have defensible space and fuel modification zones measuring 100 feet in depth.

All regulatory provisions contain exception clauses allowing diminished defensible space depth when sufficient clearance cannot be accomplished because of parcel constraints and restrictions. In such cases, defensible space is provided as "Zone 1" (removal of all native vegetation with replacement consisting of fire- and/or drought-

resistant species and “approved”, irrigated landscaping) fuel modification zones that extend to established property lines.

Recent revisions to State legislation limits extension of 100-foot-deep defensible space zones to properties in extra hazardous locations and only after an evaluation by CAL-FIRE (or Local Fire Authority Fire) Prevention personnel and when written justification has been produced. Property owners cannot be required to provide off-site fuel modification zones and defensible space beyond their property lines.

Existing Buildings and Defensible Space

Aerial photography, dated May 13, 2023, indicates that the existing single-family dwelling on the Remainder Parcel has adequate and compliant defensible space provisions. The defensible space surrounding the residence on Lot 4 may need additional mitigations before Code compliant fuel modification zones are provided.

SECTION 3
ANTICIPATED FIRE BEHAVIOR IN THE VICINITY

3.1 Fire Behavior Model

3.1.1 Summary Narrative

Anticipated Fire Behavior was analyzed after visiting the Project and identifying the on- and off-site natural vegetative fuels. Terrain and topographical inputs were determined by site visits and making comparisons with two- and three-dimensional maps.

Weather inputs were derived from the Interior Zone Worst Case Weather and Burning Conditions Table supplied by the *County of San Diego Guidelines for Fire Protection Plans* and by 2003 Cedar Fire weather and fuel parameters, which have been established as worst-case fire behavior conditions in San Diego County.

3.1.2 BEHAVE-Plus Fire Modeling

The above data inputs were subjected to analysis by the BEHAVE-Plus 5.0.5 Wildland Fire Modeling program to determine potential wildfire behavior at the Project Site.

The BEHAVE-Plus Fire Behavior Prediction and Fuel Modeling System is a computer-based systematic method of predicting wild land fire behavior. It was developed by the U.S. Forest Service at the Intermountain Forest Fire Laboratory, Missoula, Montana, and is used by wild land fire experts and scientists nationwide.

BEHAVE-Plus is designed to predict fire spread and describes fire behavior only at the flame front of a fire.

The BEHAVE fire model describes a wildfire spreading through surface fuels, which are burnable materials within six (6) feet of, and contiguous with, the ground. BEHAVE's primary fire behavior calculation parameter are dead fuels less than one-quarter (1/4") inch in diameter, which readily carry fire across the landscape. Fuels larger than three (3) inches in diameter are not included in BEHAVE calculations.

3.1.2.1 Use of Fire Model Inputs – Caveat

The BEHAVE-Plus Fire Behavior Model is a tool used by fire authorities to estimate the behavior of fire moving towards a structure under certain assumptions. The Fire Behavior Model is only an estimate and is not designed to replace the experience of the local Fire Authority, who is familiar with local wildfire behavior. The Behave-Plus fire model is not the only recognized fire model that is available; it is identified in this report only because it is the model currently used by most fire consultants and required by San Diego County.

3.1.3 FIREMAP Modeling

A second fire modeling program, FIREMAP, was used to confirm BEHAVE-Plus modeling outputs.

FIREMAP was developed to perform data-driven predictive modeling and analysis of fires that have a high potential for rapid spread. It enables "what-if" analysis of fire scenarios during pre-incident planning analysis and during real-time fire forecasting. The program is programmed with information about previous fires, past and current weather conditions and information on vegetation and landscapes from a variety of GIS and other sources of information.

Data and modeling sources include:
• FARSITE fire modeling
• Historical fire perimeters – CAL-FIRE FRAP Program and USGS GeoMAC
• Fuels – USGS LANDFIRE Program 2.4.2.3

3.1.4 Fire Behavior Threat Analysis

Evaluation of expected fire behavior on the Project site used historical data, analysis of significant wind events and identifying the different fuel models present in the area.

Analysis of the potential and foreseeable fire exposure threats to the Project Site are based on typical late summer and worst-case northeast Santa Ana wind event conditions.

For typical summer and Santa Ana weather conditions, the application of worst-burning conditions was applied for a more accurate assessment of fire conditions.

The difference in weather conditions is based on late summer afternoon west and southwest wind conditions, with 6 to 12 mile per hour velocities, and Cedar Fire wind speeds with an average velocity of 25 m.p.h. All vegetation fuel models are below their minimum fuel moisture content and extinction parameters.

3.1.4.1 BEHAVE Fire Modeling

Fire behavior modeled by BEHAVE is associated with the following burning conditions:

- Rate of Spread, characterized by distances in chains-per-hour and feet-per minute.
- Flame length, the depth of the flame front moving across the landscape.
- Safe separation distance from the flame front and building walls; and
- Fire brand/ember spotting distance from the main body of the fire and the likelihood of ignition in downwind susceptible fuels.

The table below summarizes Worst-Case fire behavior on the *non-mitigated* Project Site lands for the various fuel models during Santa Ana wind event burning conditions:

Fuel Model	Flame Length	Rate of Spread	Safety Separation	Spotting Distance
GR2 Santa Ana SE Parcel 4	13.3 feet	280ft./min.	53 feet	0.8miles/100%
Gr-1 Santa Ana SE Parcel 4	4 feet	61 ft/min	16 feet	0.2 miles/100%
GR-1 Central Parcel 4 Santa Ana	4 feet	61 feet/min.	16 feet	0.2 miles/ 100%
GR-2 Central Parcel 4 Santa Ana	13.2 feet	280ft./min.	53 feet	0.6 miles/100%
GR-1 Santa Ana NW Parcel 4	4 feet	61 ft/min.	16 feet	0.2 miles/ 100%
GR-2 Santa Ana NW Parcel 4	13.2 feet	276 ft./min	53 feet	0.6 miles/100%
SH-2 Santa Ana SE Parcel 4	11.2 feet	49 ft./min	45 feet	0.5 miles/100%
SH-5 Santa Ana SE Parcel 4	33.1 feet	306 ft./min.	132 feet	1.1 miles/100%

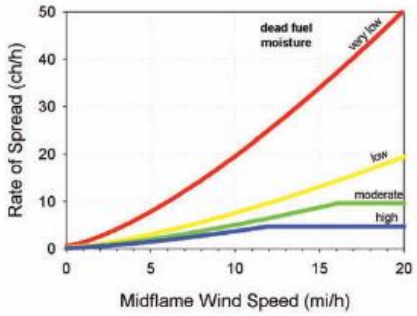
Fuel Models SH-2, Medium Load Dry Climate Shrub fuels, and SH-5, High Load Dry Climate Shrub Fuels, were analyzed to characterize the potential of unmanaged fuel beds growing in an Open Space Easement on the Project Site. The fuel models represent a fuel conversion from annual grassy fuels covering the Project Site to brush and shrubs that evolve over several years and/or decades.

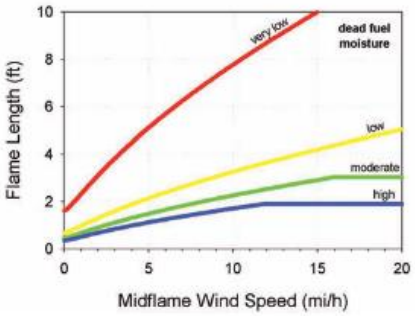
Shrub Fuel Type Models (SH)

The primary carrier of fire in the SH fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present, especially in SH1 and SH9, which are dynamic models (their live herbaceous fuel load shifts from live plant materials to dead plant materials as a function of live herbaceous moisture content). The effect of live herbaceous moisture content on spread rate and flame length can be strong in those dynamic SH models.

SH-2 Moderate Load Dry Climate Shrub

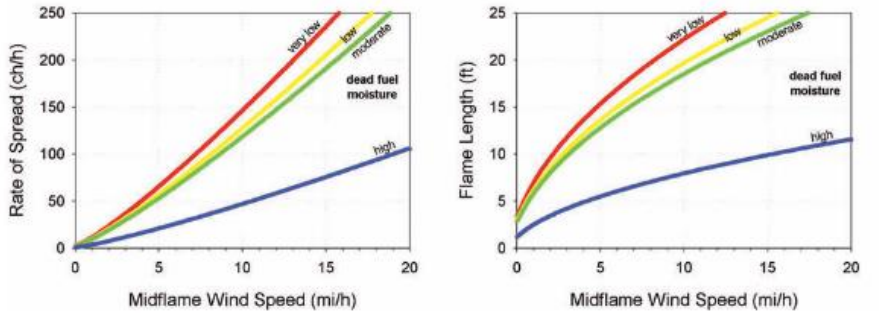
Description: The primary carrier of fire in SH2 is woody shrubs and shrub litter. Fuel Model SH-2 has moderate fuel loading with a depth of about 1 foot, and no grass fuels are present. The spread rate and flame lengths are low. SH-2 fine fuel loading is 5.2 tons per acre and the extinction moisture content level if 15%.





SH-5 High Load, Dry Climate Shrub

Description: The primary carrier of fire in SH5 is woody shrubs and shrub litter. The fuel loading is heavy with a fuel depth of 4-6 feet. The spread rate and flame lengths are very high; Moisture of extinction is high, at 15%. Fine fuel loading is 6.5 tons per acre.



3.1.4.2 FIREMAP Fire Modeling

Two fire weather conditions were analyzed by the FIREMAP modeling program:

- Typical late summer afternoon fires
  - Worst-case Santa Ana-Northeast Wind Event fires

The following fire scenarios were analyzed using FIREMAP:

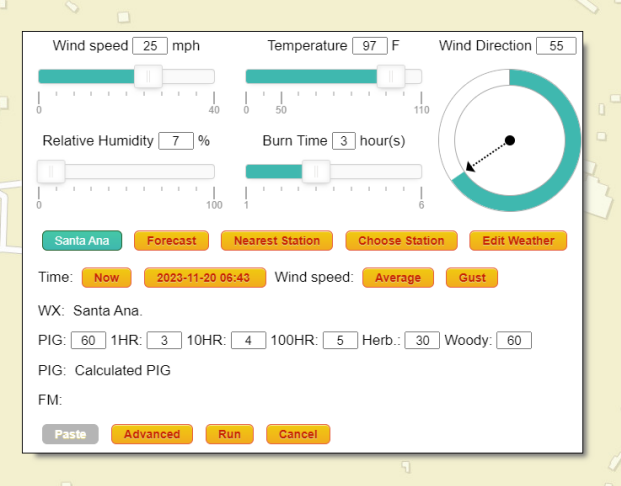
- Scenario # 1- Santa Ana Wind Event Fire – roadside ignition along Harbison Canyon Road, southeast corner of Parcel # 4.
- Scenario # 2 – Off-site Vegetation, West of Project Site at Base of Mountains, Late Fall, Pre-Santa Ana Wind Event Fire
- Scenario # 3 – Pre-Santa Ana, Late Fall Wind Event, roadside ignition along Harbison Canyon Road, southeast corner of Parcel # 4

All fire scenarios reflect a three-hour burn time in non-mitigated natural vegetative fuels. These fuels are a combination of annual grasses, shrubs, brush and chapparal.

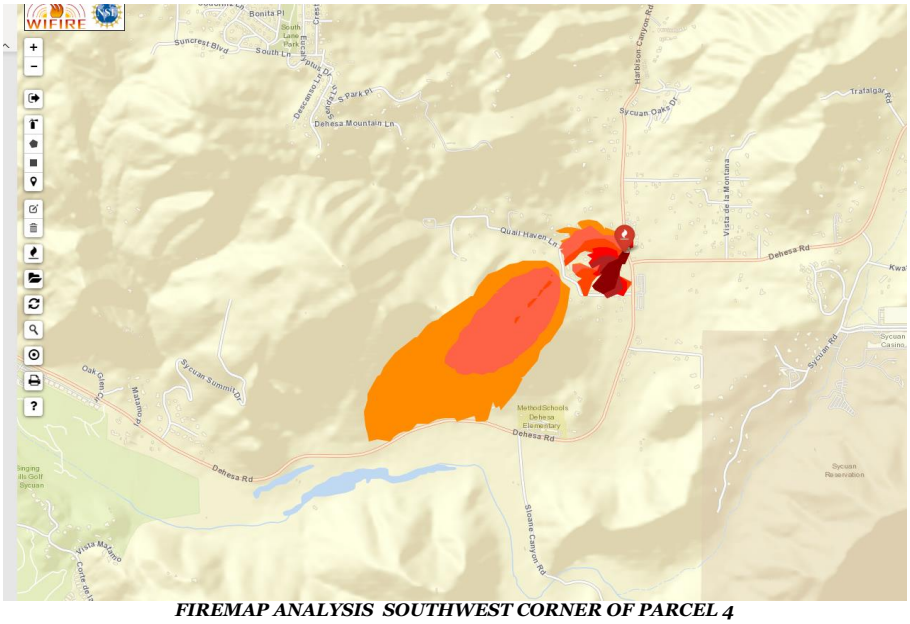
Discussion: *FIREMAP is* ***not*** *programmed to:*

- *Analyze fire suppression activities and their impacts on flame front progression across the landscape.*
- *Analyze placement of* ***new*** *defensible space/fuel modification zones and their impact on flame front progression across the landscape.*
  - *FIREMAP* ***does*** *recognize* ***well-established*** *fuel modification zones and defensible space boundaries and shows deflection of flame fronts away from, and around, existing buildings during multiple fire behavior modeling runs.*

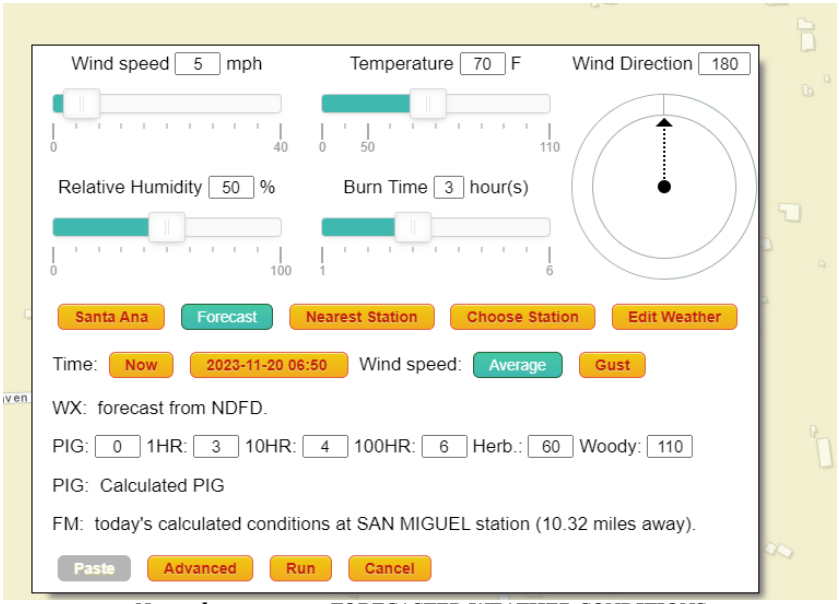
Fire behavior is mapped in one-half hour increments on the FIREMAP outputs, beginning with a dark red outline of fire spread that becomes progressively lighter as time moves forward across the landscape.



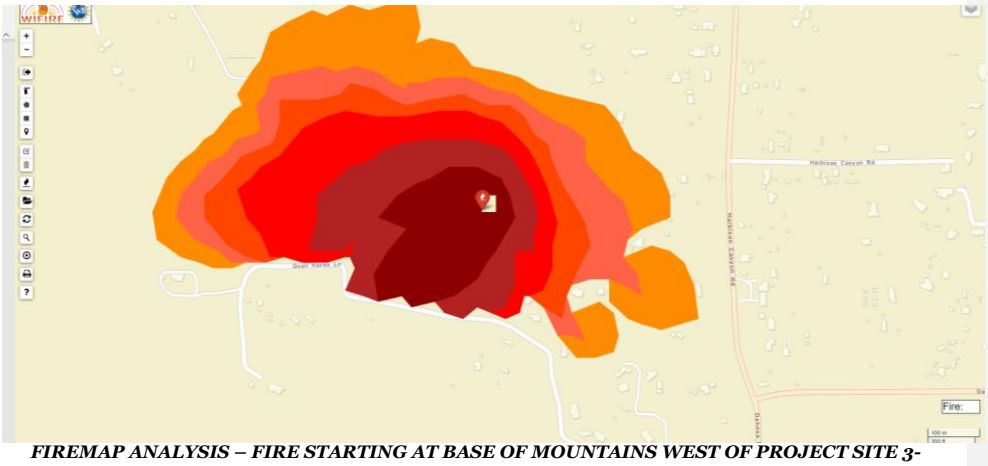
SANTA ANA WIND EVENT WEATHER CONDITIONS



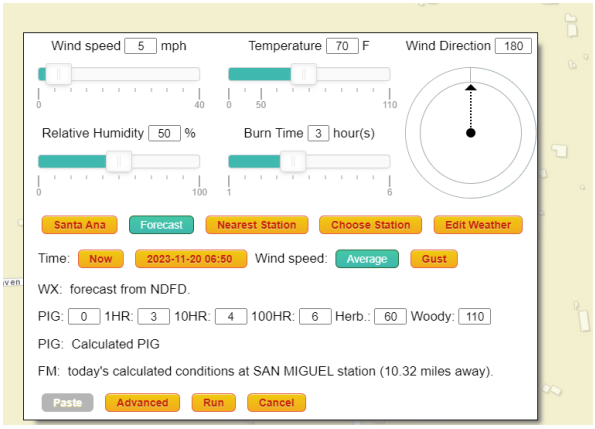
FIREMAP ANALYSIS SOUTHWEST CORNER OF PARCEL 4
SANTA ANA WIND EVENT, ROADSIDE START 3-HOUR BURN TIME

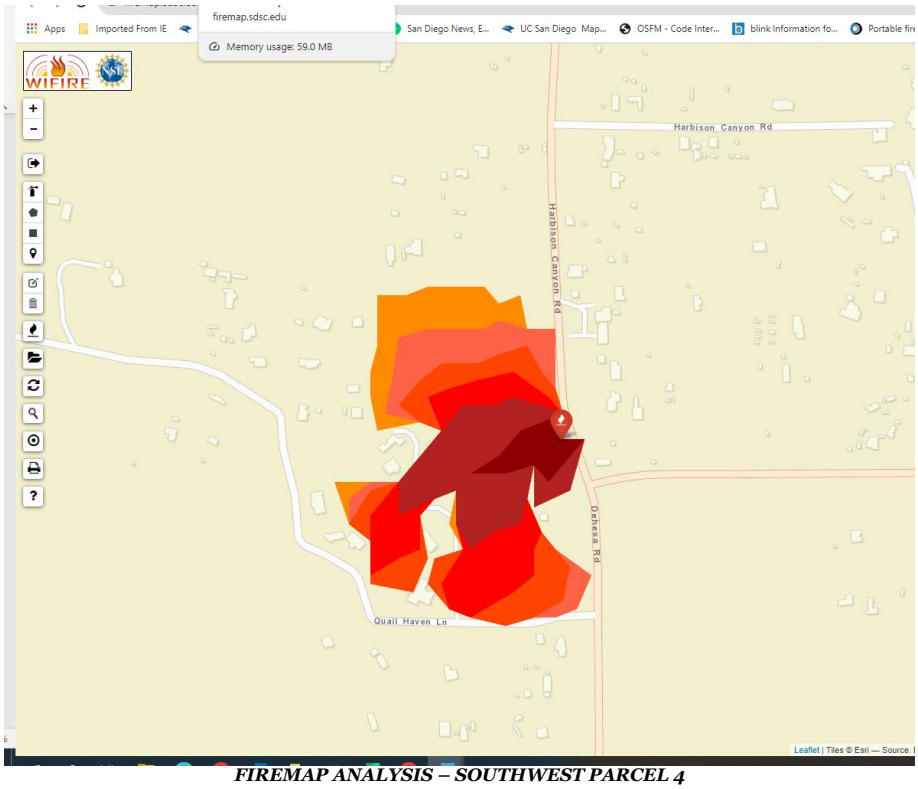


November 20, 2023, FORECASTED WEATHER CONDITIONS



FIREMAP ANALYSIS – FIRE STARTING AT BASE OF MOUNTAINS WEST OF PROJECT SITE 3-HOUR BURN TIME





FIREMAP ANALYSIS – SOUTHWEST PARCEL 4
ROADSIDE START – FORECASTED WEATHER CONDITIONS 11-20-23.

SECTION 4
ANALYSIS OF PROJECT EFFECTS

4.1 Adequate Emergency Services

4.1.1 – Fire Authority Having Jurisdiction

The Project is within the Sphere of Influence and jurisdictional boundaries of the San Diego County Fire Protection District, an "all risk" agency providing 24-7-365 fire protection services to an area of approximately 720 square miles and 26,500 residents.

The District has an Insurance Services Office (ISO) Fire Protection rating of 3 and 3y. The Fire Protection rating is on a "1 to 10" scale, with "1" being the most effective fire services and "10" the least effective.

Finding: *The standard First Alarm Structure response provided by the San Diego County Fire Protection District is commensurate to dispatch levels and personnel assignments for other career Fire Departments in San Diego County.*

Finding: *A minimum of twelve (12) firefighters (four companies with a minimum staffing of three firefighters) respond with a Command-and-Control officer to all incidents. This fire assignment provides one engine company for interior fire attack operations, one engine company for RIC (Rapid Intervention Crew for firefighters in distress rescue operations), one engine company to support interior fire attack operations and one company to provide ventilation, search and rescue functions, forcible entry, and utility securement tasks.*

Finding: *The San Diego County Fire Protection District dispatch assignments provide an effective initial attack firefighting force.*

4.1.2 – Response Time and Nearest Fire Station

The closest paid-staff District facility is Fire Station 24 in the community of Harbison Canyon. Station 24 is located at 551 Harbison Canyon Road. This station is staffed twenty-four (24) hours per day with career firefighters. It is 2.8 miles from the Project site, with an estimated travel time of five (5) minutes.

The next closest, paid status fire stations to the Project Site are:

- Sycuan Fire Station, two miles. Travel Time is seven (7) minutes.
- San Miguel FPD Station 23, 4.6 miles; Travel time is seven (7) minutes.
- CAL-FIRE Monte Vista Headquarters, eight (8) miles. Travel time is twelve (12) minutes.
- FS 23 – CAL-FIRE Flynn Springs, 9 miles; Travel Time is sixteen (16) minutes.
- SDCFA Headquarters, Jamul Station 36, 13 miles; travel time is eighteen (18) minutes.

Table S-1, Travel Time Standards, from the County of San Diego General Plan's Safety Element indicates that a maximum response time of ten (10) minutes is allowed for Single Family Dwellings in Land Use Designations SR-1, Semi-Rural Residential Areas. Response time for Rural Lands having low density residential areas (SR-4, SR-10, and RL-20) is twenty (20) minutes.

Table S-1 Travel Time Standards from the Closest Fire Station*

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	■ Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1) ■ Commercial and Industrial Designations in the Village Regional Category ■ Development located within a Village Boundary	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	■ Semi-Rural Residential Areas (> SR-1 and SR-2 and SR-4) ■ Commercial and Industrial Designations in the Semi-Rural Regional Category ■ Development located within a Rural Village Boundary	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	■ Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) ■ *All* Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low-density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.

The County of San Diego General Plan specifies a maximum response time of ten (10) minutes for Semi-Rural Zoning and twenty (20) minutes for Rural Zoning.

Finding – *The primary fire apparatus resources for the Project, under normal, non-emergency driving conditions, will be able to travel to the Project Site within the County's General Plan Emergency Response Time criteria.*

Finding: *San Diego County Fire Authority comment entry, Line 10-1, of the Project's Issue Checklist spreadsheet document indicates that there are no travel distance issues for the Project Site.*

Finding: *The Project is, therefore, in compliance with the General Plan's Emergency Response Time criteria.*

4.2 Fire Access

4.2.1 - Access to Project Site

See Section 2.2.2 for details of existing and proposed Project Site Access provisions.

4.2.2 Current Private Road Conditions

The vehicular travel paths on the Project Site are a combination of graded, decomposed granite and asphalt driveways, with an average fourteen (14') foot improved width. The

paved driving surfaces are ten (10') feet wide, with average four (4') foot wide graded decomposed granite surfaces on the northern sides of the driveway. Both driving surfaces provide good driving conditions.

Typical Driving Surface of Existing Driveway, Looking North from Proposed Parcel 3

The existing driving surfaces will be replaced by all-weather pavement capable of sustaining the imposed weight of a 75,000 lb. fire apparatus. The new roadway will have a forty (40) foot easement and an all-weather paved surface that is twenty-four (24') foot wide.

4.2.3 -– On-Going Road Maintenance

The project developer has three options for funding private road maintenance:

1. California Civil Code Section 845 – requires that the owner(s) of a private road easement maintain the road in good repair through formal agreements or proportional sharing of costs incurred. Enforcement of the in-perpetuity road maintenance operations is by legal action in a court of law having authority over the right-of-way or by judgment of an impartial arbitrator. The judgment may be enforced as a money judgment by any party against any other party to the legal action taken.

2. County of San Diego Private Road Maintenance Agreement - as authorized by Section 21065 of the California Public Resources Code and Sections 81.402(c)(1) and 81.703(c)(1) of the County of San Diego Code of Regulatory Ordinances, the developer, individual lot owners and the County may enter into private road maintenance agreements. This type of agreement binds current and future low owners to provide equal and proportional sharing of road maintenance costs that include, but are not limited to, the following operations - reasonable and normal road improvement and maintenance work to adequately maintain said private road easement and related drainage facilities to permit all weather access, filling of chuck holes, repairing cracks, repairing and resurfacing of roadbeds, repairing and maintaining drainage structures, removing debris, maintaining signs, markers, striping and lighting, if any, and other work reasonably necessary or proper to repair and preserve the easement for all weather road purposes.

3. Creation of a Permanent Road Division – A Permanent Road Division zone is a special district established at the request of property owners with a common road related need in a specific area for repairs and maintenance. Property owners must pay all the costs of the PRD through a special benefit assessment or parcel charge assessment on their property tax bill. The cost to each individual property owner is determined by the benefit their property receives because of road repair and maintenance.

4.3 Water Supply

4.3.1 – Existing Water Distribution System

The Project Site is in the Eastern Service Area of the Padre Dam Municipal Water District.

The District has an existing 16-inch PVC water main and fire hydrants installed along Harbison Canyon Road in the vicinity of the Project Site.

There are three existing fire hydrants on Harbison Canyon Road within 500 feet of the intersection of Street A. The closest existing fire hydrant is approximately ninety-five (95) feet away from this intersection, on the east side of Harbison Canyon Road.

4.4 Ignition Resistant Construction and Fire Protection Systems

4.4.1.1 – Existing Structures on Project Site

There are two existing single-family residences) on the Project Site.

Review of aerial photography for the Project Site and the adjacent area indicate that both existing houses on the Project Site may have been constructed between 1992 and 1994. The two residences were noted in undamaged or undamaged condition following the 2003 Cedar Fire wind event incident, which burned and damaged many other buildings within the Harbison Canyon community and drainage.

Observation of the building on the Remainder Lot indicates it was not constructed according to Chapter 7-A Building Code requirements for Very High Fire Severity Areas and Wildland Urban Interface Zones. As such, additional fire protection mitigations are recommended in Sections 4.75 and 5.3 to provide a reasonable amount of protection against fire flame contact, radiant heat energy exposures and ember shower events typical of wildfires.

Existing Single-Family Dwelling on Remainder Lot

The existing single-family dwelling on Parcel 4, while newer than the residence on the Remainder Lot, also does not appear to have CBC Chapter 7-A construction features.

Existing Single-family Dwelling on Parcel 4

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas. Likewise, automatic fire sprinkler systems conforming to NFPA Standard 13-D for residential fire sprinklers in one- and two-family dwellings shall be installed for all buildings and auxiliary structures designated by the most current San Diego County FPD local ordinances and the San Diego County Consolidated Fire Code.

4.4.1.2 – Existing Off-Site Structures

There are seven (7) structures located in the off-site residential properties surrounding the Project Site. The area around the project is zoned for, and developed as, a combination of residential and agricultural uses. The separation distances from adjacent properties and buildings and the Project Site have been determined not to present a direct fire exposure threat to the Project Site buildings.

When fully developed, the Project Site will serve as an in-fill development. As such, and with the mitigations provided in this Fire Protection Plan, the existing fire threats created by the native and non-native annual grassy fuels on the property will be modified and will provide a reasonable degree of safety from fires beginning on-site spreading away from Project lands.

4.5 Fire Fuel Assessment

4.5.1 General Description of Vegetative Fuels

The predominate vegetation on the existing Project Site is annual native and non-native grass species. There are a limited number of shrub species observed and several species of trees are present. Tree species include a large cluster of pepper trees in the northeast corner along the existing driveway, with oaks and pines located elsewhere on the property.

4.5.2 Fire Behavior of Identified Vegetative Fuels

4.5.3 Fire Behavior Threat Analysis of Developed Project Site

The combination of required defensible space around structures and enhanced fire resistive building code requirements for the project site will remove and/or modify the existing natural vegetation. This will create an entirely different fuel model, which will most resemble Suburban Development (NB-1) or Agricultural Land (NB-3).

Fuel Model NB-1 includes lands covered with suburban development that will not support wildfire spread but *may* experience structural fire losses during vegetation fires. Building ignitions usually occur from house-to-house exposures or from firebrands, neither of which are modeled by current Fuel Model parameters or fire behavior modeling programs.

Fuel Model NB-3 includes agricultural lands maintained in non-burnable condition. NB-3 vegetation includes irrigated crops and mowed landscaping. If not maintained in a non-burnable condition, NB-3 lands must be categorized as another fuel model type.

The fuel model sets currently used by fire scientists, fire behavior analysts and Fire Protection Plan consultants do not have the ability to simulate fire behavior changes created by various fuel treatments. Fuel Models are based on fully cured vegetation at or near their seasonal extinction moistures and, concurrently, at the worst part of the annual fire season. This tends to produce *over-prediction* of fire spread rates and other fire behavior parameters, especially in annual grass fuels.

The Fuel Model parameters used by BEHAVE-Plus for grass fuels expresses an extinction moisture content level of 15% for annual grasses and assumes a potential heat release rate of approximately 8000 BTUs per pound of fuel present on the landscape, whether the fuel is in a “live” or “dead” condition.

BEHAVE fire modeling for Fuel Model GR-1 irrigated lawns with a 30% fuel moisture level will not ignite or produce a flame front that will spread across the landscape.

Other sources indicate that irrigated lawns and landscaping (from approved plant lists for defensible space in fire prone areas), as proposed as part of the defensible space guidelines for the project, will have a fuel moisture content of at least 120%. Fuel moisture contents of 120% result in green, non-cured vegetation, with all herbaceous materials remaining in the "live" fuel categories. As a result, grassy fuels with high fuel moisture content will produce flame lengths of one (1') or less and have a rate of spread of approximately 5 chains (330 feet) per hour when exposed to a 20 m.p.h. mid-flame wind.

4.6 Setbacks from Property Lines

The minimum setback from any property line in high hazard fire areas is thirty (30') feet. The thirty-foot setback applies even though County Zoning Setback distances may be less.

Exceptions may be allowed if parcels are smaller than one acre, or upon review and approval from both the FAHJ and County Planning.

Minimum setback from property lines abutting national forests, open space. *preserves,* and designated riparian areas is 100 feet.

The San Diego County Consolidated Fire Code does *not* have prescriptive language indicating that 100-foot setbacks apply to Open Space *Easements*. Review of California legislated regulations for Open Space areas also indicates that 100-foot setbacks adjacent to Open Space Easements are *not* required.

Analysis of the Tentative Parcel and Preliminary Grading plans for the Project Site indicates that the required building setbacks will be provided.

4.7 Defensible Space and Vegetation Management

In general, the applicable California, San Diego County and local fire codes and ordinance regulating the imposition of defensible perimeters around buildings requires that a minimum 100-foot Fuel Management/Fuel Modification Zone will be established and maintained around all buildings and structures with a footprint exceeding 250 square feet. These prescriptive regulations also include clauses indicating that no off-site clearing is required or authorized.

Fuel Modification Zones are specific areas on a property where vegetation has been removed, planted with alternative landscaping, or modified in other ways that increase the likelihood that a structure will survive a wildfire, improve defensible space around the structure for firefighting activities and prevent flame contact with the building from a spreading fire.

Using this strategy, vegetation, including ornamental plants, non-native, naturalized or invasive plant species are removed and re-planted with fire- and drought-tolerant species. Vegetation may also be thinned to decrease the available vegetative fuel loading on the property. The reduction of available fuel affects the flame lengths and the amount of heat produced by the fire. It also decreases fuels around houses that can ignite through firebrands and ember showers that are commonly produced by wildfires moving across the landscape.

Each sub-zone in a Fuel Modification Plan is designed to lower the amount of fuel available to a wildfire the closer a fire gets to a building. Additionally, the amount of moisture retained by plants inside Fuel Modification Zones increases as the distance from buildings decreases.

However, it is important to remember that these Fuel Modification principles (removal of flammable vegetation, thinning flammable vegetation and providing irrigated fire-resistant landscaping within perpetuity maintenance of defensible space) does *not* guarantee structure survivability during wildfires. The defensible space-fuel modification zone strategy increases the chance of survivability and provides a reasonable level of relative safety.

Because of the nature of Southern California soil, it is imperative to consider the potential for hillside erosion and the need for slope stabilization. Every effort should be made to avoid the need for total removal of native vegetation on hillsides.

Increasing structural setbacks for proposed structures on slopes will reduce the amount of work required on the adjoining hillside as well as improving defensible space around the structure. Efforts should be made to use modified native vegetation on slopes as much as possible to provide adequate hillside stabilization.

Native plants are better adapted to local topography and provide important wildlife habitat and protection from erosion. Erosion concerns, combined with the need to address water conservation measures, require the careful selection of plant species as well as the placement of pathways, patios, retaining walls and other landscaping features so that a well-designed, fire-wise landscape provides an environment that accomplishes more than achieving the goal of fire safety mitigation.

Defensible space can be accomplished in ways other than plant modification. Paved brick, gravel pathways, rock borders, dry streambeds, water features, swimming pools and other features made of non-combustible materials can contribute to a structure's defensible space.

Structural survivability can also be improved by using the fire resistive building construction standards outlined in Chapter 7-A and 7-B of the California Building Code.

4.7.1 Regulatory Mandates for Fuel Modification Zones

4.7.1.1 California Fire Code Section 4907

Section 4907 provides baseline and primary prescriptive requirements for defensible space around buildings on both State and Local Responsibility Areas.

Other applicable regulations, however, have different defensible space mandates, and must also be referenced and potentially complied with.

For buildings on SRA lands, defensible space requirements are derived from:

- California Public Resources Code, 4290 sections *and*
- SRA Fire Safe Regulations, CCR Title 14, Division 1.5, Chapter 7, Subchapter 2, Section 1270.

Defensible space for buildings in Very High Fire Severity Areas on LRA lands are regulated by the following documents:

- Government Code sections 51175 through 51189 *and*
- Any local ordinance enacted by the Fire Authority having jurisdiction.

4.7.1.2 California Government Code Section 51175-51189

Section 51182 establishes the minimum acceptable defensible space prescriptive requirements for *all* political sub-divisions and jurisdictions in California.

Section 51182 requires that anyone who owns, leases, controls, operates of maintains an occupied dwelling or structure in, on or adjacent to a mountainous area, forest-covered land, brush-covered land, grass-covered land, or lands covered with any flammable materials in a designated Very High Fire Severity Area shall always provide defensible space and fuel modification practices.

The prescriptive requirements for defensible space under Government Code section 51182 mandate the following minimum mitigations:

- 100 feet of defensible space must be maintained on each side of buildings.
- Defensible space shall not extend beyond the property lines of the parcel.
- The amount of defensible space *shall* be determined according to the "flammability" of individual buildings.
- The amount of defensible space *shall* be determined by the type of vegetation present around the building.
- Vegetative fuels shall be maintained in a condition so that a wildfire burning under *average* weather conditions will be *unlikely* to ignite the building.
- These provisions do not apply to single, well-maintained, and pruned vegetation in a condition that will not rapidly transmit fire from nearby vegetation to the building or from the building to the vegetative fuel bed.

- Fuel management intensity within the 100' perimeter around the building *can* vary, with the most intense mitigations provided in the first thirty (30') feet around the exterior walls of the building.
- Remove any portion of a tree that extends within 10 feet of the outlet of a chimney or stovepipe.
- Maintain a tree, shrub, or other plant adjacent to or overhanging a building free of dead or dying wood.
- Maintain the roof of a structure free of leaves, needles, or other vegetative materials.

4.7.1.3 San Diego County Consolidated Fire Code

The County of San Diego, and participating independent fire protection districts, have adopted, and amended the California Fire Code. Amendments to base line prescriptive regulations in the California Fire Code may be more restrictive, must be consistent with clearly identified local conditions, and must comply with established statutory guidelines.

The following amendments impacting Defensible Space and fuel modification practices were added to, and published in, the latest edition (2022) of the San Diego County Consolidated Fire Code and adopted by the San Diego County Fire Protection District.

4.7.1.3.1 Section 4907.1 – General Fire Setbacks

This amendment has prescriptive language requiring that all buildings intended for human occupancy must be setback from parcel property lines or open space *easement* perimeter boundaries thirty (30') feet.

Three exceptions are attached to this section:

- The setback regulation does *not* apply to *existing and duly permitted* buildings.
- The setback regulation *may* be waived, or adjusted accordingly, if the wildfire hazards present on the project site/property are not significant.
- The setback regulation *may* be waived, or adjusted accordingly, if terrain, parcel size or other constraints make establishing required setbacks infeasible.

4.7.1.3.2 Section 4907.1.2 – 100-foot Setbacks

This amendment requires 100-foot fire setbacks from the perimeter boundaries of national forest lands, open space *preserves* and state parks.

Finding: *Depending on development findings, the Project Site may be required to include an open space easement within its boundaries.*

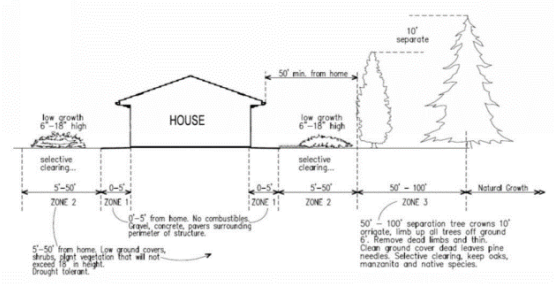
Finding: *The 100-foot setback for Open Space Preserves does not apply to the Project Site.*

***Finding**: Open Space Easement setback requirements are not established by the amended section of Section 4907.1*

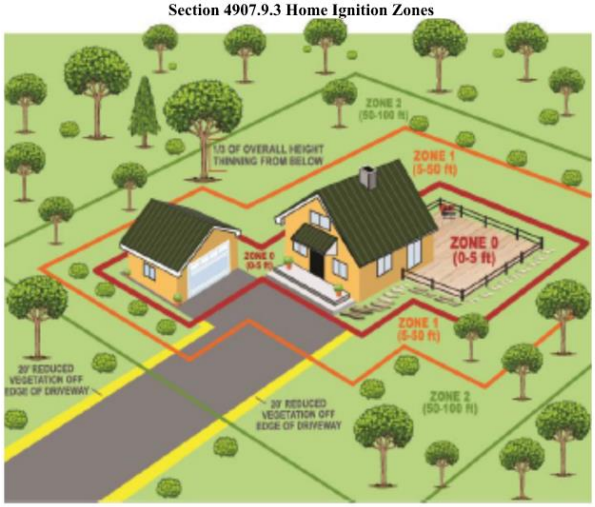
4.7.1.3.3 – 4907.2 Fuel Modification Zones

This amendment establishes a requirement for providing fuel modification zones around all buildings designed for human habitation.

FIGURE 4907.2
MEASUREMENTS OF FUEL MODIFICATION DISTANCE



Section 4907.9.3 Home Ignition Zones



As amended, the following fuel modification standards are established:

- For buildings *greater* than 100 feet from property lines, the responsible party shall provide defensible space with a minimum width of 100 feet:

    - The first fifty (50') of defensible space around a building shall be cleared of all combustible vegetation; vegetation will be replaced with fire resistant plants from an approved plant list.
    - The second fifty (50') feet of defensible space (51 to 100 feet from exterior building walls) shall have 50% of the vegetative fuel bed removed; all dead and dying materials removed; and 50% of the remaining vegetative material in plant canopies removed.
- For buildings *less* than 100 feet from a property line, the responsible party shall provide required defensible space mitigations *to the extent possible*
    - Defensible space is to be provided according to the appropriate zone width or to the property line, whichever is closer.
- Biological Open Space Easements – new buildings cannot be built if the required defensible space depth will encroach into the protected lands.
- Limited Building Zones – the Limited Building Zone perimeter is intended to prevent building fires from extending from the structure into the vegetative fuel beds surrounding the building under consideration.
    - According to the San Diego County *Guidelines for Determining Significance, Wildland Fire and Fire Protection* manual, a LBZ providing a protective buffer for protected biological lands ***may be combined with standard Fuel Modification Zone defensible space*** for the building under consideration (Section 1.2, page 3).

4.7.2 Vegetation Management

Prescribed Defensible Space (fuel management zones) will be maintained by the property owners at least annually or more often as needed. Boundaries of fuel management zones will be permanently identified in a manner acceptable to the Fire Authority Having Jurisdiction.

Landscaping and plants in Defensible Space zones shall be selected from an approved fire-resistant planting materials list that is published by County of San Diego, Department of Planning and Land Use.

Many vegetation communities, including wetland habitats, depend on a regular cycle of burning for maintaining the optimal species balance, seed viability and reproduction.

The natural fire cycle is affected by human activities by either increasing fire activity over decreased time spans or decreasing fire activity by fire prevention and protection requirements.

However, fire management for human safety must continue in a manner compatible with biological resource preservation mandates. As a result, and because of the proximity of the adjacent residential and commercial developments, closeness of suburban population, and the history of extreme and erratic fire behavior in San Diego County as a whole, neither CAL-FIRE nor the San Diego Couny Fire Protection District will allow planned controlled burning of vegetation adjacent to Project Site lands or the

sub-division for biological maintenance and enhancement purposes. This policy is likely to continue well into the future.

4.7.2.1 General Vegetation Management Guidelines

Brush and vegetation management to reduce fuel for the protection of urban and rural land uses may be implemented when new or existing development occurs adjacent to dedicated biological and other open space lands.

The Government Code regulating High and Very High Fire Severity Areas allows vacant, undeveloped lands to remain in an unmanaged condition *until* certain forms of development or the erection of buildings occurs on, or adjacent to, protected lands.

Management of fuel modification zones depends upon where the defensible space is located on the landscape:

- Private property owners are responsible for providing fuel modification zones their own individual properties; and
- *If* required, the Open Space Easements *may* provide and manage property line defensible space when adjacent to private property with development and/or established buildings

4.7.2.2 Vegetation Management for Biological Resources

This section describes essential vegetation management practices for biological resources, without introducing management principles involving controlled burning across the landscape.

4.7.2.3 Vegetation Management Goals

Vegetation management goals are meant to develop strategies that are consistent with the governmental regulations. Vegetation management goals are, therefore, focused on environmental resource preservation and enhancing the existing native habitats.

The Vegetation Management Goals for the Open Space Easement lands include:

- Ensuring viability and sustainability of the native eco-system and its natural processes.
- Protecting the existing biological resources from disturbance and incompatible activities
- Management of invasive, non-native species
- Developing fuel reduction methods consistent with ensuring fire protection mitigations for the residential buildings adjacent to the Open Space Easement lands.

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To achieve these vegetation management goals, the following objectives should have been developed to achieve desired levels of resource protection and public and firefighter safety:

- Maximize native vegetation community quality.
- ***Identify and remove invasive non-native plants.***
- ***Provide effective methods for removing and controlling invasive non-native plants.***
- Minimize adverse impacts to sensitive and high value habitats.

- Utilize approved fuel and plant reduction programs for habitat preservation, enhancement, and restoration.
- Provide site fire behavior information to local fire agencies, primarily the San Diego County Fire Protection District and CAL-FIRE, for inclusion in wildfire pre-response plans.
- ***Minimize*** the likelihood of catastrophic fires originating in the Open Space Easement
- Identify Wildland-Urban Interface (WUI) areas.
- Develop WUI area fuel management goals to prevent wildfire from impacting these areas and to protect the Project Site from fires originating on adjacent, unmanaged WUI lands.

4.7.2.3.1 Non-Native Plant Species Removal and Control

Native and, particularly, naturalized invasive plant species may dominate the vegetation communities in an open space habitat.

Invasive non-native plant species have significant impacts on native plant associations, ecosystem processes and biodiversity.

Non-native plants have few controls on their population sizes and tend to thrive under human-caused conditions. These species exhibit aggressive growth and spread across the landscape, outcompeting, and harming, sensitive species. In addition, non-native and invasive species can, and often do, alter nature fire regimes by increasing and intensifying wildfires. Therefore, special management measures are needed for their removal and control.

4.7.2.3.2 Specific Removal Methods

The selection of an appropriate removal method depends on several variables, including:

- Time of year
- Nesting seasons
- Severity of invasive infestations
- Proximity to sensitive plants and wildlife
- Amount of intermixing between invasive species and sensitive habitat
- Access to invasive species site
- Proximity to water ways and surface waters

Manual Removal

Manual removal of vegetation can be done by hand pulling, grubbing, hoeing, and use of small fuel powered tools. Manual removal is a low impact method of controlling invasive plant species in a native vegetation habitat.

Manual removal is best used for eliminating small amounts of annual weeds in isolated locations where complete removal of the plant's root system is possible.

Manual removal is recommended over the use of herbicides where sensitive species will be impacted by application and potential overspray patterns from discharged herbicides.

Plant materials removed by manual methods should not be left on Project Site lands and are required to be disposed off-site at an appropriate location.

Mechanical Removal

Mechanical removal may be required to remove larger plants and trees from the Project Site.

Cutting above ground plant materials can be accomplished by chain or handsaws. The dropped materials should be chipped and removed from Project Site lands, with disposal at an appropriate off-site location.

Herbicides may be applied to stumps or root systems left in place, following the manufacturer's recommendations. Stumps remaining on site after cutting and herbicide application should not be removed or have grinding operations applied; they should be allowed to decompose in place.

Large-scale mechanical methods (i.e., use of masticators, bulldozers or tractor-drawn tillers or soil rippers) are ***not*** recommended for removal of invasive species on Project Site lands. Use of large-scale mechanical removal machines may cause unnecessary and irreparable damage to sensitive habitats and can lead to unintentional contamination of waterways and standing bodies of water.

In addition, these machines incorporate substantial steel blades, or teeth, as an operating function. This poses a distinct wildfire ignition source, despite best preventative efforts and caution, when the steel accidentally contacts rocks, boulders, and other hardened surfaces, releasing high energy and high temperature sparks into receptive vegetation fuel beds.

Herbicides

Herbicide applications may be used as a separate mitigation means or in combination with other removal methods.

Herbicides are recommended after removal of invasive tree species or perennial species that have regenerative capabilities, especially when removal of all root fragments is not possible. Herbicide application should be limited to localized direct application to specific plants instead of generalized over-spraying of an area.

A wide range of herbicides is available for use. Any use of herbicides on Project Site lands to control invasive plant species should be under the observation of a biologist and performed by a State licensed herbicide technician.

Cut and Daub Methods

This treatment is recommended for larger invasive plants to prevent re-growth and to kill the portion of the plant remaining above ground after manual or mechanical removal measures have taken place.

The cut and daub method incorporates cutting invasive plant stalks above ground, followed by an immediate and direct application of an appropriate herbicide to the freshly cut stump.

Similar cut and daub techniques include:

- Drill and fill method – holes are drilled into tree trunks, followed by injection of

herbicides into the holes.
- Glove method – a herbicide-soaked glove is applied directly to freshly cut stumps or to plant foliage.

Regardless of the method used, immediate application of an appropriate herbicide to the plant is critical to ensure that the herbicide is absorbed into the plant tissues.

4.7.2.4 Management of Fuel Modification Zones and Defensible Space

Mitigations to be Provided:

1. All proposed lots will provide Fuel Modification Zone 0, 1 and 2 defensible space perimeters.
2. All native and non-native natural vegetation on individual lots on lands surrounding the proposed building pads, and, if required, outside of Biological Open Space Easements, shall be removed.
3. Removed vegetation shall be replaced with San Diego County approved fire- or drought-resistant vegetation or irrigated landscaping.
4. Landscaping and defensible space areas shall be maintained in perpetuity by the owner/occupant of each residence or individual parcel owner.

Fuel Modification Zones 0 comprises the Building Ignition Resistance Zone defensible space.

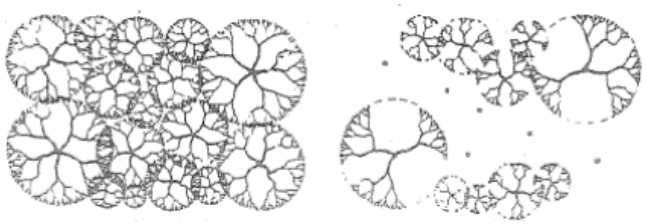
FMZ-0 begins at the exterior wall of the building and extends outward a minimum of five (5') feet. FMZ-0 provides a non-combustible space where no plants or other ignitable materials are allowed to accumulate.

Fuel Modification Zone 1 begins at the outer boundary of FMZ-0 and extends laterally outward, with, in combination with FMZ-0, a minimum width of 50 feet from the exterior walls of the protected building. Fuel Modification Zone 0 and 1 also includes the level building pad. All flammable, native vegetation is removed from FMZ-1 and is replaced with approved irrigated landscaping, as indicated in the *County of San Diego Approved List for Defensible Space in Fire Prone Areas* (***See Attachment A).***

FMZ-2 Defensible Space begins at the outer perimeter boundary of FMZ-1 and extends laterally outward for an additional fifty (50') feet. In FMZ-2, 50% of flammable native vegetation is permanently removed. The remaining 50% of the vegetation is treated in-perpetuity by removing 50% of the vegetative crown/canopy. Property owners will periodically remove, on at least an annual basis, all dead and dying plant materials from the 50% thinned vegetation remaining inside of the FMZ-2 perimeter boundaries.

Zone 2 defensible space also requires removal of dead and dying materials in vegetation canopies; thinning, lacing, and pruning of branches; and mowing and weed whipping of grasses and weedy plants.

PLAN VIEW



100% Canopy Coverage, Solid Foliage Mass with no Spaces between Plants

Reduced to 50% by Combination of Thinning and Removal of Canopy Coverage

Landscaping and maintenance of plantings will include limited irrigation to ensure establishment of fire-resistant landscaping (ground covers, shrubs, and trees).

If 100 feet of defensible space is *not* obtainable around every building, the owners of individudal parcels are responsible for fuel modification zone perimeters for fifty (50') feet around any flat building pads and on natural slopes or manufactured slopes around the buildings with irrigated or fire resistant landscaping.

If fifty feet of defensible space is *not* available because of project constraints, individual parcel owners will provide FMZ 1 and 2 configured defensible space on the lands surrounding the buildings, or to the property line, whichever is closer, to the extent possible and provide additional fire protection mitigations, as determined by the San Diego County Fire Protection District and San Diego County Department of Development Planning Services.

Fire-resistant landscaping must be permanently irrigated and maintained. Plants with high moisture content levels are less likely to burn. Thick succulent or leathery leaf plant species are the most fire resistant' plants; paper-thin leaves and small twiggy branches are the least fire resistant.

Plants in FMZ-1 defensible space will ***not*** include ***any*** pryophytes, which have high oil and resin content. This includes coastal sage and other scrub and chaparral species and eucalyptus, cedar, and juniper tree species.

Proposed trees must be planted and maintained so that when they reach maturity the distal ends of their drip line branches are at least 10 feet away from any structure.

Regular maintenance and continued irrigation are especially important in all defensible space zones 1.

The irrigated landscaping in FMZ-1 consists of native and non-native fire resistant and maintained plantings less than 18 inches high. This Zone may also contain fire resistant specimen size trees or single well-spaced ornamental shrubs taller than 18 inches, intermixed with ground covers.

Although all plants will burn under extreme fire conditions, research has shown that some types of plants, including many natives, are more fire resistant than others.

The County of San Diego Recommended Plant List includes examples of low fuel volume, non-oily, non-resinous plants commonly refered to as “fire resistant”. This term comes with the caveat that these plants must be annually pruned, all dead or dying vegetative materials removed, with all grasses or other plant material removed from beneath the circumference of their canopies.

The Recommended Plant List includes native species that are not considered undesirable from either a biological or wildfire risk management perspective *if* they are *properly* maintained by June 1st of each year.

The Recommended Plant List in ***Appendix ‘A’*** includes a list of low fuel volume, non-oily, non-resinous plants commonly refered to as “fire resistant”. The term “fire-resistant” includes the caveat that all plants must be annually pruned; all dead and dying wood or vegetative materialsremoved; and all grasses or other plant material are removed from beneath the circumference of their canopies.

The Recommended Plant List in ***Appendix ‘A’*** includes native species allowed on project properties that are not considered undesirable from either a biological or wildfire risk management perspective *if* they are properly maintained by June 1st of each year.

Single specimens of native and non-native vegetation species may be allowed in defensible space area, at the discretion of the FAHJ, if they do not present a hazard of spreading wildfire flame fronts to buildings on the Project Site or exposing them to significant amounts of radiant and convective heat energy.

The Memorandum of Understanding (MOU) between the San Diego County Fire and State and Federal Wildlife Agencies authorizes incidental take(s) for specific federally listed endangered and threatened species. Take is also authorized for species listed as threatened, endangered or candidates as indicated in Chapter 1.5 of Division 3 of the California Fish and Game Code. The Take Authorization is limited to the specific activities delineated in the MOU.

Individual parcel owners *must* provide fire management activities for the protection of sensitive natural resources, as stipulated in applicable State and Local codes and ordinances. These activities include brush clearing, fire clearing, weed abatement to reduce the risks and threats caused by wildfires to habitable buildings and structures.

Vegetation management activities shall follow, to the extent possible, the Best Management Practices provided in the Table below:

Fire Safety Vegetation Best Fuel Management Practices

Fuel Management in Areas with Natural Woody Vegetation (around homes and commercial buildings)	• Remove or thin natural vegetation using hand tools and hand-held power tools. • Do not use motorized vehicles for clearing. • Limit fuel management to the limits established by the Wildlife-Fire Agencies MOU (generally 100 feet from dwellings and commercial buildings and within 30 feet of driveways. • Leave shrub roots intact to prevent soil erosion. • Do not remove single specimen trees (i.e., oaks) unless they present a fire danger to a building. • Dispose of cut vegetation by removing it from the site or leaving it in place (chipped or crushed) as mulch or composting. • Do not dispose of cut vegetation in stream courses – decaying vegetation can contaminate water quality and create fire hazards. • Avoid fuel management activities during bird breeding season(s) in coastal sage scrub vegetation (February 15th – August 20th)
Fuel Management in Areas with non-woody vegetation (around homes and commercial buildings)	• Remove or thin grassy areas in ways that minimize soil and root disturbance (mowing, raking, cutting) • Use heavy equipment only when necessary – when the FAHJ requires disking of an area. • Limit fuel management to the limits established by the Wildlife-Fire Agencies MOU (generally 100 feet from dwellings and commercial buildings and within 30 feet of driveways. • Leave shrub roots intact to prevent soil erosion. • Do not remove single specimen trees (i.e., oaks) unless they present a fire danger to a building. • Dispose of cut vegetation by removing it from the site or leaving it in place (chipped or crushed) as mulch or composting. • Do not dispose of cut vegetation in stream courses – decaying vegetation can contaminate water quality and create fire hazards. • Avoid fuel management activities during bird breeding season(s) (February 15th – August 20th)
Fuel Management along roads and trails	• Avoid fuel management activities during bird breeding season(s) (February 15th – August 20th) • Leave roots intact to prevent soil erosion. • Dispose of cut vegetation by removing it from the site or leaving it in place (chipped or crushed) as mulch or composting. • Do not dispose of cut vegetation in stream courses – decaying vegetation can contaminate water quality and create fire hazards. • Use of heavy machinery is allowed in these areas to maintain low growth of vegetation within 10 to 30 feet of roadways. This also serves to protect natural areas from roadside ignition sources. • Trimming or removal of trees is allowed to maintain roadway safety (i.e., emergency vehicle access; elimination of falling hazards; eliminating barriers to traffic visibility)
Fuel Management Around Streams and Other Wetlands	• Within wetlands areas, avoid vegetation management activities. These are sensitive habitat areas for wildlife and water quality. • Remove only woody materials that are dead and only if the materials present a fire hazard to dwellings. Use hand tools (including power hand tools – chainsaws and weed whips). • Do not use motorized vehicles for clearing. • Avoid fuel management activities during bird breeding season(s) in coastal sage scrub

	vegetation (February 15th – August 20th) • Avoid fuel management activities during raptor breeding season(s) (January 1st through September 15th) • Do not remove live vegetation within stream courses or other wetlands without first consulting the County Department of Planning and Development Services. • If a landowner suspects the occurrence of rare, threatened, or endangered species on their property in areas subject to fuel modification, Calif. Department of Fish and Game and US Fish and Wildlife Service prior to performing fuel modification activities.

4.7.3 Recommendations for Open Space Encroachment Defensible Space

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In accordance with the combined provisions allowed in the California Fire Code, California Government Code, San Diego County MOU and San Diego County Consolidated Fire Code, the following Alternate Means of Compliance for Open Space Encroachment Defensible Space is recommended to ensure the safety of the existing and proposed parcels.

1. Under MOU provisions, provide reasonable defensible space mitigations around the Open Space Easements which are immediately adjacent to established and proposed residences in a manner that vegetative features are retained as much as is feasible for protection of life and property inside the Project Development Site.
2. As much as practical and reasonable, institute those fuel mitigation measures required by the California Fire and Government Codes that prevent unnecessary disturbances to the vegetation in the Open Space Easement.
3. Provide vegetation management mitigations that protect the sensitive habitat and biological easement spaces from the encroachment of external exposure to heat and flames resulting from building fires outside of the Open Space Easement limits.
4. As permitted, limited, and supervised, fuel management may be conducted inside of the fifty (50') foot perimeter of the Open Space Area perimeter.
5. Following industry wide standard vegetation management practices, annual grasses growing in the Open Space and adjacent to buildings shall not be required to be removed where necessary to prevent soil erosion and slope stabilization.
6. The clearing or trimming of native vegetation to protect existing *and proposed* buildings in potentially dangerous fire areas is allowed *if* the clearing or trimming is the minimum necessary to comply with applicable Fire Codes or orders of fire safety officials on any Steep Slope Lands.
7. Annual grasses in the Open Space Easement and adjacent to buildings may be maintained at a canopy height not to exceed six (6") inches above the ground. Maintenance of the maximum fuel canopy height shall be an in-perpetuity Condition.

4.7.4 Fuel Modification Zone Maintenance Requirements

Fuel Modification Zones and Defensible Space shall be maintained in perpetuity.

The following requirements also shall apply to this project:

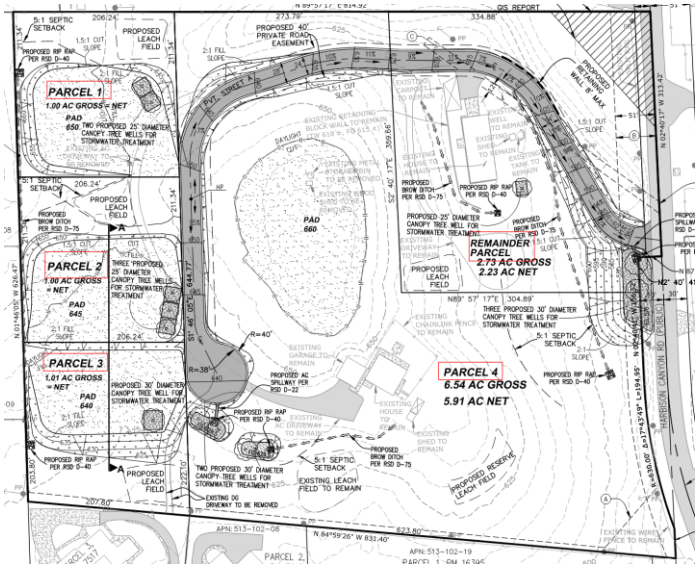
1. Each property owner shall be responsible for all irrigation and landscaping of Fuel Modification Zones within their property boundaries. Fuel Modification Zones and Defensible Space shall be limited to the area within established property lines and shall not extend off-site of established parcels.
2. The San Diego County Fire Protection District will hold each parcel owner accountable for enforcement of all wildfire protection issues discussed in this Fire Protection Plan.
3. Each property owner shall not allow dumping of trash or disposal of yard trimmings in Fuel Modification Zones and Defensible Space areas.
4. The San Diego County Fire Protection District, or its designated representative(s), shall decide any disputes related to individual lot landscaping or fuel treatments involving an interpretation of this Fire Protection Plan. Decisions made by the Fire Protection District shall be final and binding on property owners.
5. If modifications to the Parcel Map occur, any part and/or all the Fire Protection Plan may be revised at the discretion of the San Diego County Fire Protection District.
6. Debris and trimmings produced by thinning and pruning will be removed from the site.
7. The annual completion of all designated Fuel Modification Treatments will occur before June 15th.
8. All individual landscaping plans, including for additional structures, will comply with the Fire Protection Plan.
9. Trees and plants will be planted in accordance with the "County of San Diego Approved Plants for Defensible Space in Fire Prone Areas List" or as approved by the San Diego County Fire Protection District.
10. Boundaries of Fuel Management Zones shall be clearly and permanently marked.

Prescribed Defensible Space (fuel management zones) will be maintained by the property owners at least annually or more often, as needed. Landscaping and vegetation in Defensible Space areas will be from an approved fire-resistant planting materials list provided by the County of San Diego, Department of Development Planning Services.

4.7.5 Fuel Modification Zones for Project Building Pads

There are two existing single-family dwellings on the Project Site, located on Parcel # 4 and the Remainder Parcel.

Three future single-family dwellings will be erected on proposed Parcels 1, 2 and 3, located on the west side of the site, along the western shoulder of the as-to-be-named Street "A" roadway corridor.


PARCEL 1
1.00 AC GROSS = NET
PARCEL 2
1.00 AC GROSS = NET
PARCEL 3
1.01 AC GROSS = NET
PARCEL 4
6.54 AC GROSS
5.91 AC NET
REMAINDER PARCEL
2.73 AC GROSS
2.23 AC NET
PROPOSED 40' PRIVATE ROAD EASEMENT
PVT. STREET 'A'
PAD 650
PAD 660
PAD 645
PAD 640
PROPOSED LEACH FIELD
EXISTING LEACH FIELD TO REMAIN
PROPOSED RESERVE LEACH FIELD
EXISTING DG DRIVEWAY TO BE REMOVED
APN: 513-102-08
APN: 513-102-19
PARCEL 2
HARBISON CANYON RD (PUBLIC)

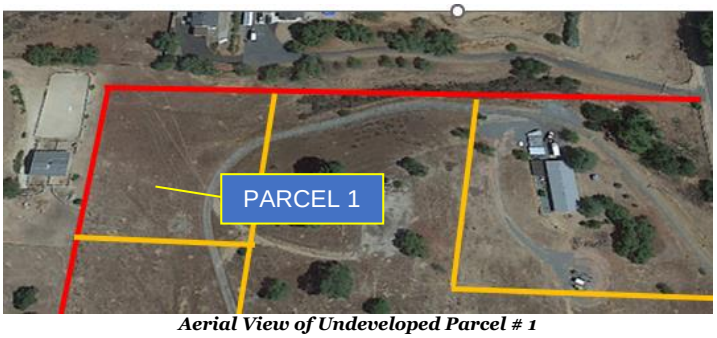

2030 Harbison Canyon Rd

For Fuel Modification Zone/Defensible Space design purposes, the following analysis parameters were developed:

- One single-family dwelling will be constructed on Parcels 1, 2 and 3
- The design building footprint is 3000 square feet, formed by 54.77' x 54.77' rectangles shown centrally located on each proposed building pad.
- The theoretical building footprint provides the ability to compare potential and anticipated worst-case fire behavior and calculate reasonable, effective, and adequate defensible space perimeters around a building pad.
- FMZ 0 (Building Ignition Resistance Zone) and FMZ-1 are combined and represented by a GREEN block around the building.
- FMZ-2 is represented by ORANGE blocks, spaced a minimum of fifty (50') feet away from the exterior walls of the building.
- Roadside fuel modification zones, with a minimum width of twenty-five (25') feet measured from the road shoulder, are consistent with FMZ-1 requirements and indicated by GREEN blocks alongside of the roadway corridors.
- The existing single-family dwellings on Parcel 4 and the Remainder Parcel will be required to provide defensible space under the prescriptive provisions of the California Public Resources Code, Health and Safety Code, Government Code and Fire Code.
- Precise defensible space configurations for Parcels 1, 2 and 3 will be implemented during the future planning and construction phases for these buildings when developed.

4.7.5.1 Parcel # 1 Defensible Space

Parcel # 1 is located at the northwest corner of the Project Site and on the western shoulder of the to-be-named Street "A".



Aerial View of Undeveloped Parcel # 1

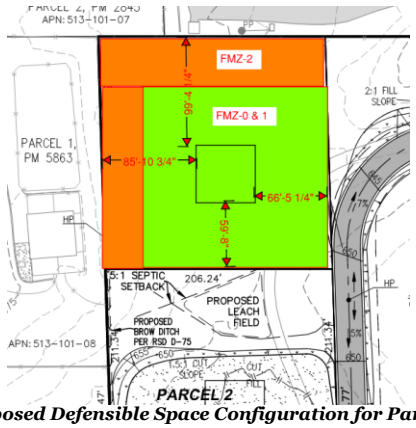
Using the 3000 square foot ground-floor building footprint of a potential building on the proposed building pad, effective and reasonable defensible space perimeters can be applied to parcel.

The following defensible space is provided for the configuration and size of Parcel # 1:

- North side – ninety-nine (99') feet, combined FMZ 0, 1 and
- East side – sixty-six(66') feet to property line; 100 feet to east shoulder of Street A right of way corridor. All defensible space on the east side of this parcel is a combination of FMZ 0, FMZ-1 building and roadside FMZ-1 configurations.
- South Side – fifty-eight (58') to southern property line; fifty (50') feet of shared FMZ-1 on north side of Parcel # 3 (*total, 108 feet*).
- West Side – ninety-one (91') feet to western property line.
- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

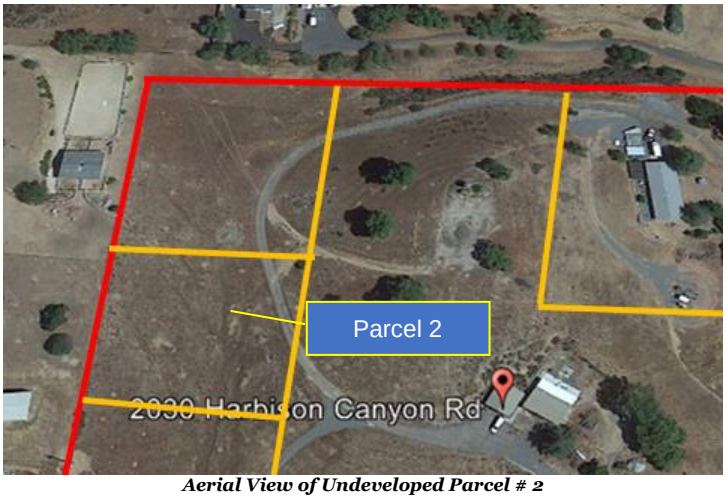
- For Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum sixty (60') feet provided.*
- For Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum sixty (60') feet provided.*
- For Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *minimum sixty (60') feet provided.*
- For Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire conditions. *Minimum of 142 feet and a maximum of 154 feet of separation is provided*
    - Safe separation distance includes the width of the paved surface of Street A, which has the equivalency of a non-combustible surface meeting FMZ-1 requirements.
    - Safe separation distance includes the roadside fuel modification zone on both sides of Street A, with a total defensible space width footprint of sixty (60') feet meeting MFMZ-1 requirements.



Proposed Defensible Space Configuration for Parcel 1

4.7.5.2 Parcel # 2 Defensible Space

Parcel # 2 is located at the west central side of the Project Site and on the western shoulder of the to-be-named Street "A".



Aerial View of Undeveloped Parcel # 2

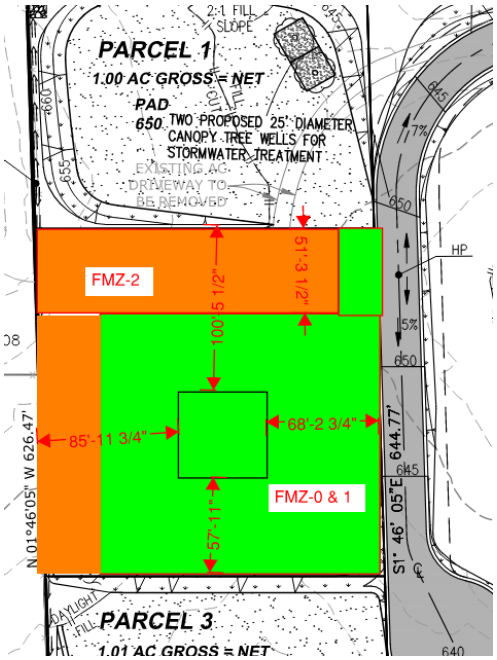
The following defensible space is provided for the configuration and size of Parcel # 2:

- North side – 100 feet, combined FMZ 0,1 and 2
- East side – sixty-eight (68') feet to property line; 100 feet to east shoulder of Street A right of way corridor
- South Side – fifty-seven (57') feet to southern property line; sixty-two (62') feet of shared FMZ-1 on north side of Parcel # 3 (*total 120 feet)*
- West Side – eighty-six (86') feet to western property line.
- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

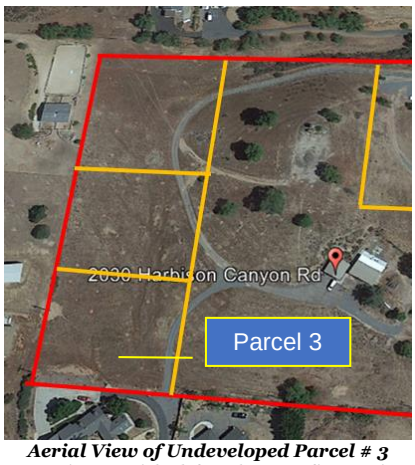
- For Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum fifty-seven (57') feet provided.*
- For Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum fifty-seven (57') feet provided.*
- For Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *minimum fifty-seven (57') feet provided.*

- For Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire conditions. *Minimum of 133 feet and a maximum of 157 feet of separation is provided*
    - Safe separation distance includes the width of the paved surface of Street A, which has the equivalency of a non-combustible surface meeting FMZ-1 requirements.
    - Safe separation distance includes the roadside fuel modification zone on both sides of Street A, with a total defensible space width footprint of sixty (60') feet meeting MFMZ-1 requirements.



4.7.5.3 Parcel # 3 Defensible Space

Parcel # 3 is located at the southwest side of the Project Site and on the western shoulder of the to-be-named Street "A".



Aerial View of Undeveloped Parcel # 3

The following defensible space is provided for the configuration and size of Parcel # 3:

- North side – 62 feet, combined FMZ 0,1 and 2; *combined FMZ-1 with an additional fifty-eight (58') feet from Parcel # 2 for a total 120 feet of FMZ-1.*
- East side – sixty-eight (68') feet to property line; 100 feet to east shoulder of Street A right of way corridor and 160 feet to eastern edge of cul-de-sac bulb.
- South Side – 101 feet to southern property line; combination of fifty-one (51') feet of FMZ 0 and 1 and fifty (50') feet of FMZ-2.
- West Side – ninety-one (91') feet to western property line; fifty (50') feet of combined FMZ 0 and 1 and fifty-one feet of FMZ-2.
- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

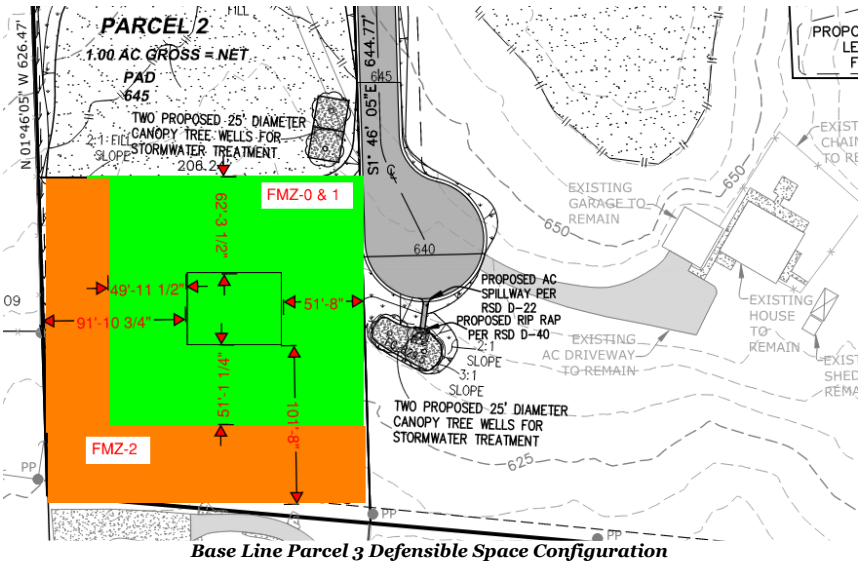
- Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum sixty-two (62') feet provided*
- Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum fifty-one (51') feet provided.*
    - ***NOTE** – with a combined FMZ-1 and FMZ-1 Roadside defensible space on the east side of the parcel, where the anticipated worst case fire front would impact the parcel, eighty-one (81') feet of safe separation is provided.*
- Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *minimum fifty-seven (57') feet provided. Minimum fifty-one (51') feet is provided on the parcel.*
    - ***NOTE** – with a combined FMZ-1 and FMZ-1 Roadside defensible space on the east side of the parcel, where the anticipated worst case fire front would impact the parcel, eighty-one (81') feet of safe separation is provided.*

- Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire conditions. *With parcel constraints, a maximum of fifty-eight (58') feet is available for safe separation distance.*

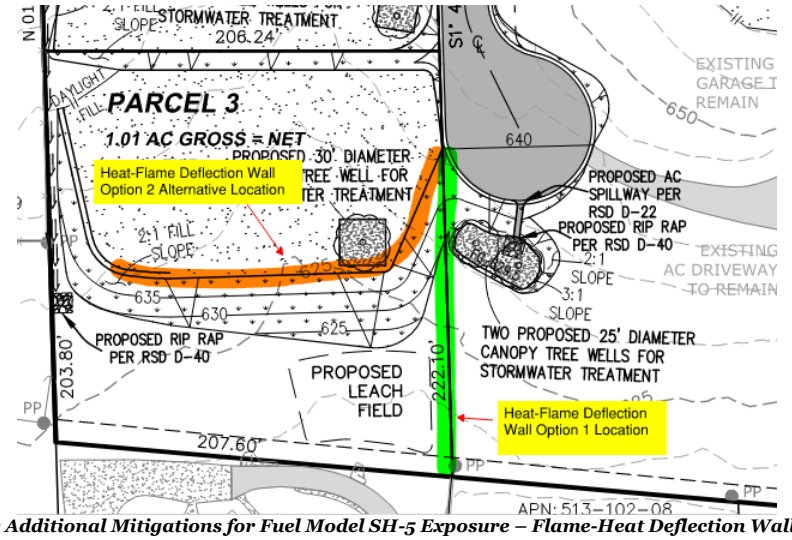
Additional Defensible Space Mitigations with Performance-Based Designs are required for Parcel # 3.

The following performance based defensible space mitigations are recommended:

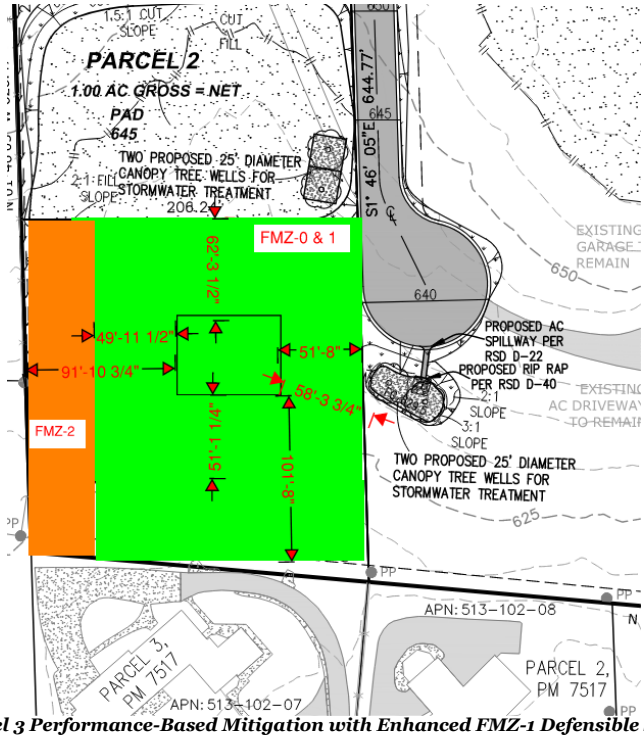
1. *Install a concrete block (CMU) or combination CMU and FR-rated (or tempered glass) flame-heat deflection wall along the east side of Parcel 3, with the following features:*
    a. *Minimum six foot tall wall height*
    b. *Installed in a north to south configuration, beginning adjacent to the terminal cul-de-sac bulb on Street A and extending to the southern property parallel to the shared PL between Parcels 3 and 4.*
    c. *Alternatively, install a combination CMU-FR-rated glass (view panels) heat/flame deflection wall at, or near, the top of the 2:1 fill slope adjacent to the building pad. The combination wall would be installed at the top of slope topographic line beginning at the terminal cul-de-sac bulb and will extend along this topographic line to the southwest corner of the parcel.*
2. *Provide minimum one-hour FR-rated exterior walls facing the fire exposure threat on the east and south sides of the single-family residence. The exterior wall rating includes opening protectives such as doors and windows.*
3. *Provide, if reasonably required, FR-rated roll-down window shutters on south and west windows exposed to a fire front originating on Parcel 4 and the southeast corner of Parcel # 3.*
4. *Extend FMZ-1 defensible space on the south side of the parcel to the southern property line, for a total FMZ-1 perimeter having a depth of 101 feet.*



Base Line Parcel 3 Defensible Space Configuration



Parcel 3 Additional Mitigations for Fuel Model SH-5 Exposure – Flame-Heat Deflection Walls



Parcel 3 Performance-Based Mitigation with Enhanced FMZ-1 Defensible Space

4.7.5.4 Parcel # 4 Defensible Space

Parcel # 4 is in the central and southeast areas of the Project Site and on the eastern shoulder of the to-be-named Street "A". It has an "L"-shaped configuration.

Parcel # 4 has an existing single-family dwelling built in the south-central portions of the lot.

Parcel # 4 is the largest parcel on the Project Site and will have three (3) areas of potentially unmanaged vegetation fuel beds:

- Northern portion of the parcel, exposing the southern and eastern shoulders of the Street A right-of-way shoulders
- Eastern and southeastern portions of the parcel, with exposures to the west shoulder of the Harbison Canyon roadway right-of-way corridor.
- Southwest corner of the parcel, with a potential fire exposure to the southeast corner of Parcel # 3.

There is a potential that Open Space Easements may be required on portions of Parcel #4 because of biological and waterway resources. Imposition of Open Space Easements

may create the need for providing Limited Building Zones (PBZ) between the existing building and the boundary line of protected lands. The needs for determining placement of LBZs have not been determined at the time of writing of this Fire Protection Plan and will be determined during future planning development of the Project Site.

Limited Building Zones – the Limited Building Zone perimeter is intended to prevent building fires from extending from the structure into the vegetative fuel beds surrounding the building under consideration.

According to the San Diego County *Guidelines for Determining Significance, Wildland Fire and Fire Protection* manual, a LBZ providing a protective buffer for protected biological lands *may be combined with standard Fuel Modification Zone defensible space* for the building under consideration (Section 1.2, page 3).

Given the potential fire exposure threats from unmanaged fuels in potential Biological Open Space Easements and unmanaged fuels in multiple locations outside of prescriptively required Fuel Modification Zones, performance-based depths for defensible space must be provided on Parcel 4.

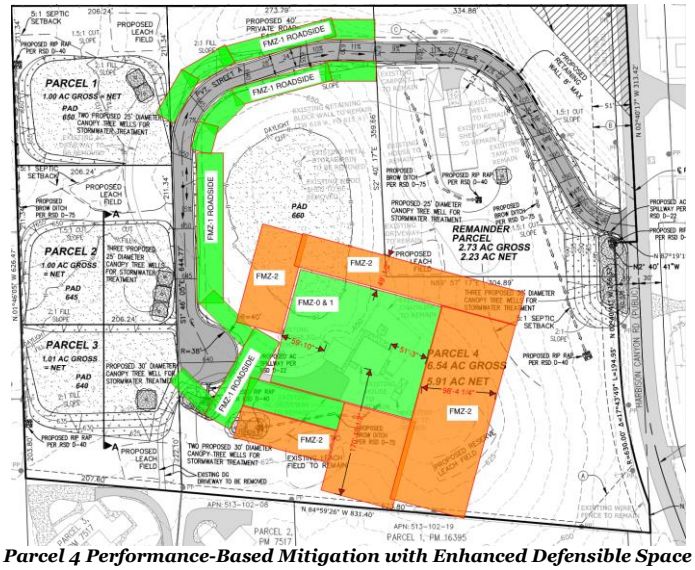
The following defensible space is provided for the configuration and size of Parcel # 4:

- North side – 110 and 161 feet, combined FMZ 0,1 and 2
- East side – 174 feet, combined FMZ 0,1 and 2. FMZ 2 will have approximately 100 feet of depth from its boundary with FMZ-1.
- South Side – 178 feet; combination of fifty (50') feet of FMZ 0 and 1 and minimum 100 feet of FMZ-2.
- West Side – 157 feet to western property line; combined FMZ 0 and 1.
- Roadside Fuel Modification Zone, east, north and south shoulders of Street A – thirty (30') feet provided between the terminal cul-de-sac bulb and northeast property line with Remainder Lot.

- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

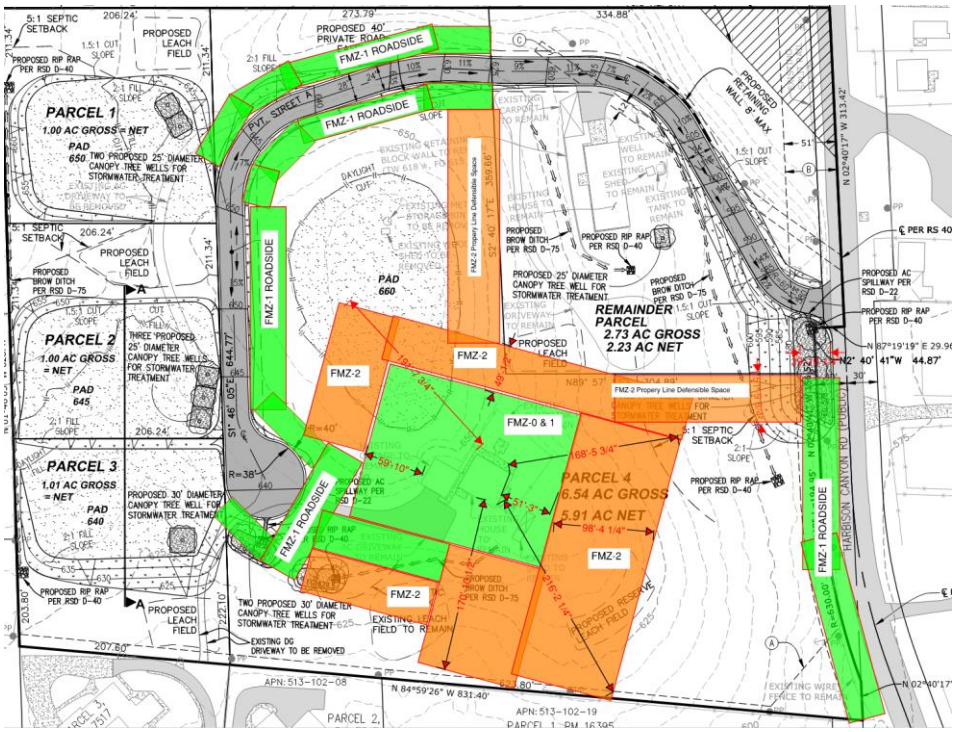
The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

- Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum fifty (50') feet provided*
- Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum 100 feet provided.*
    - ***NOTE** – with a combined FMZ-1 and FMZ-2 defensible space on the east and southeast sides of the parcel, where the anticipated worst case fire front would impact the parcel, a minimum 150 feet of safe separation is provided.*
- Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *Minimum 150 feet is provided on the parcel.*
- Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire conditions. *Minimum of 161 feet is provided on the parcel.*



Parcel 4 Performance-Based Mitigation with Enhanced Defensible Space

Based on site constraints on the Remainder Parcel immediately adjacent to Parcel 4's eastern side, a performance-based design Property Line Defensible Space may be required along the PL line between Parcel 4 and the Remainder Parcel on the south side of the Remainder Parcel and along the east side of Parcel 4's western PL with the Remainder Parcel. ***See Section 4.7.5.5.2 for additional details.***



Changes to Parcel # 4 Defensible Space Configuration

4.7.5.5 Remainder Parcel Defensible Space

The Remainder Parcel is located at the northeast corner of the Project Site, along the southern shoulder of Street "A."

The Remainder Parcel has an existing single-family dwelling built in the central and northern portions of the lot.

Given the parcel configuration constraints, and potential fire exposure threats from unmanaged fuels in potential Biological/Waterway Open Space Easements and unmanaged fuels outside of prescriptively required Fuel Modification Zones, two alternative defensible space schemes, with performance-based depths for defensible space, are recommended for the Remainder Parcel.

4.7.5.5.1 Scheme # 1, Standard Defensible Space Configuration

The following defensible space is provided for the configuration and size of Parcel # 4:

- North side – eighty-three (83') of combined FM 0 and 1; thirty feet of Roadside FMZ on north shoulder of Street A right-of-way corridor (*total 133 feet*)
- East side – 135 feet, combined FMZ 0,1 and Roadside FMZ-1.
- South Side – 139 feet; combination of fifty (50') feet of FMZ 0 and 1 and minimum eighty-nine (89') feet of FMZ-2.
- West Side – ninety-two (92') feet to western property line; combined FMZ 0 and 1.
- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

- Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum fifty (50') feet provided*
- Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum 100 feet provided.*
- Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *minimum 100 feet is provided on the parcel.*
- Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire

conditions. *Minimum of 139 feet is provided on the south side of the parcel and ninety-one (91') feet is provided on the west side.*

- **NOTE:** The existing building, on the remainder lot, with its inherent space constraints, was approved before current defensible space regulations were adopted. Aerial images of the parcel, and site analysis, indicates that defensible space is adequately provided to the existing property lines.

The current defensible space provisions on the Remainder Parcel meets the intent and prescriptive requirements of Section 4907 of the San Diego County Consolidated Fire Code, CCR Title 14 Division 1.5, Chapter 7, Subchapter 2, Section 1270, Section 4290 of the California Resources Code, and Sections 51175 through 51189 of the California Health and Safety Code for site constraints.

Finding: *The constrained defensible space depths on the Remainder Parcel provide sufficient safe separation distance from Fuel Model SH-2 Dry Climate Moderate Load Shrub fire behavior characteristics.*

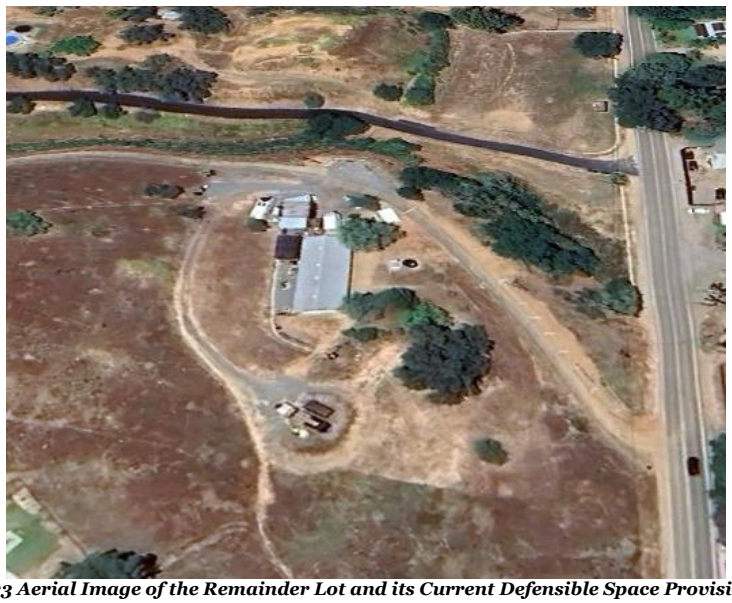
Finding: *The FAHJ will need to take into consideration the current Code compliance of the existing and constrained defensible space depths for the Remainder Lot when analyzing the potential SH-5 fire behavior safe separation distance deficiencies.*

Finding: *If the SH-5 safe separation zone deficiencies are determined to be hazardous to the existing building on the Remainder Lot, the following mitigations may be reasonably provided, if so required:*

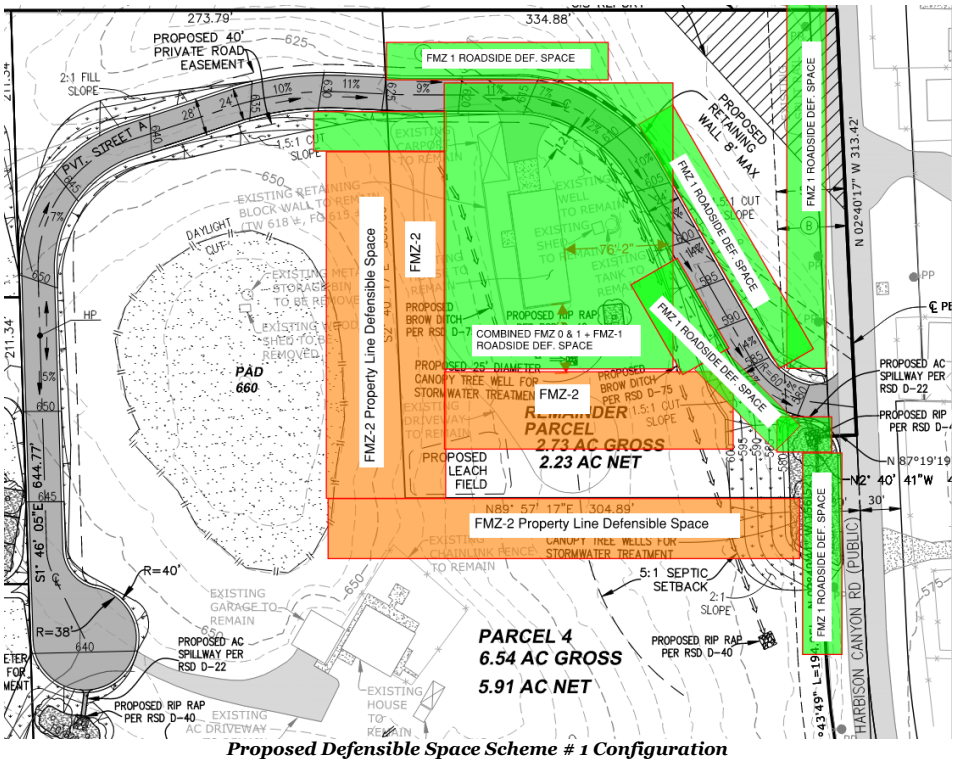
- *Provide heat/flame deflection CMU block or combination CMU/FR-rated glass view walls around the most threatened areas of the Parcel.*

NOTE: Trees overhanging the east and west sides of the building will require thinning of the vegetative canopy to provide decreased risk of fire exposure to the roof of the house.

1985 Aerial Image of the Remainder Lot and its Defensible Space Provisions



2023 Aerial Image of the Remainder Lot and its Current Defensible Space Provisions



Proposed Defensible Space Scheme # 1 Configuration

4.7.7.5.2 Scheme# 2, Performance-Based Design Defensible Space Configuration

With the site constraints and complexities associated with the parcel, the Consultant recommends that all lands on the Remainder Parcel undergo a performance-based design defensible space configuration in which the entire parcel is modified to Provide a combination of FMZ 0 and 1 fuel modifications.

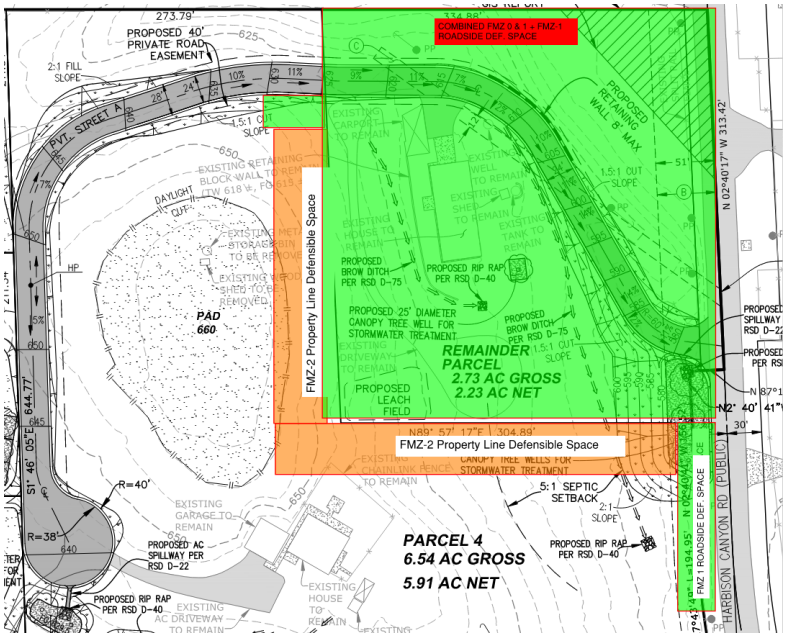
The following defensible space is provided for the configuration and size of Parcel # 4:

- North side – 133 feet of combined FM 0 and 1 will be provided.
- East side – 207 feet, combined FMZ 0,1 and Roadside FMZ-1.
- South Side – 139 feet of combined FMZ 0 and 1 defensible space.
- West Side – ninety-two (92') feet to western property line; combined FMZ 0 and 1.
- Fire setback – all sides of the building will comply with the minimum thirty (30') foot setback distance from property lines.

- West Side – require a fifty (50') foot wide Property Line Defensible Space with FMZ-2 requirements, in a south-to-north configuration along the following property lines contiguous between Parcel # 4 and the Remainer Parcel:
    - On the west side of Parcel 4's eastern PL and west of the Remainder Parcel
    - On the north side of Parcel 4's northern PL and south of the Remainder Parcel.

The proposed fuel modification zones will provide the following safe separation distances from unmanaged fuels that may be present (due to Open Space Easement impositions) on the developed Project Site:

- Fuel Model GR-1, Short/Sparse Annual Dry Climate Grassy Fuels – requires sixteen (16') feet of separation; *minimum ninety-two (92') feet provided*
- Fuel Model GR-2, Moderate Load, Annual Dry Climate Grassy Fuels – requires fifty-three (53') feet of separation; *minimum ninety-two (92') feet provided.*
- Fuel Model SH-2, Moderate Load Dry Climate Shrub – requires forty-five (45') feet of separation; *minimum ninety-two (92') feet is provided on the parcel.*
- Fuel Model SH-5, Heavy Load Dry Climate Shrub – requires 132 feet of separation from the fire front on Parcel # 4 under Santa Ana Wind Event fire conditions. *Minimum of 189 feet is provided on the south side of the parcel and 145 feet is provided on the west side.*



Proposed Defensible Space Scheme # 2 Performance-Based Design Configuration

4.7.7.5.3 Off-Site Development Defensible Space

Evaluation of the neighborhood adjacent to the Project Site indicates that there are eight (8) existing single-family dwellings along, or near, its perimeter property lines.

Evaluation of the defensible space zones provided around the adjacent homes indicates that Code compliant fuel modification zones have been established around these buildings.

Aerial View of Project Site & Adjacent Existing Homes

With the placement of adequate defensible space around the off-site existing homes, the proposed development of the Project Site is an in-fill development project.

The defensible space around the adjacent off-site houses created a modification to the previously undeveloped land and unmanaged vegetation covering it. With development of the off-site properties, the landscape, and its vegetation, evolved in a separate and different category of Fuel Models – NB-1, Non-Burnable Urban and Suburban Lands.

Fuel model NB-1 consists of land covered by urban and suburban development. There is no expected fire spread or extreme fire behavior anticipated in lands designated as Fuel Model NB-1.

To be called NB-1, the area does not support wildland fire spread.

However, areas mapped as NB-1 may experience structural fire losses during wildland

fire incidents. These structural ignitions are caused by either house-to-house exposures or by firebrands, neither of which is directly modeled using fire behavior fuel models.

The development of the Project Site will remove significant amounts of flammable vegetation from the neighborhood when built out as an in-fill project. The removal of these fuels enhances the existing defensible space mitigations currently provided for the neighboring buildings, and synergistically, improves reasonable means of protecting the on-site proposed and existing buildings from wildfire exposures.

4.8 Cumulative Impact Analysis

San Diego County's weather, fuel, and terrain contribute to the development of intense, uncontrolled wildfires as evident by the recent Cedar, Paradise and Otay fires of October 2003 and the Witch, Harris, and Poomacha Fires of 2007. The areas of greatest concern for the impact of wildfires on developments are projects immediately adjacent to, or intermixed with, undeveloped wild land areas or unmanaged vegetation stands in Open Space preserves. As the population of San Diego County increases and the Wildland Urban Interface (WUI) expands, fire hazards and risks will continue to be encountered. Vehicle access to residential subdivisions next to WUI areas or Open Space easements and an increase in other human activities in these areas increases the risk of property loss, injury or death and contribute to the impact of potential wild land fires.

The proposed Project Site will be an "in-fill" development between other existing residential properties. The Project proposes a four-lot land division for future residential development on the currently partly developed parcel.

Undeveloped portions of the Project Site are covered with native, naturalized and, potentially, invasive vegetation. The existing undeveloped parcel potentially represents a fire hazard to adjacent properties. This may create an unrestricted path of fire extension into developed residential areas. This threat will continue until the mitigations proposed in this Fire Protection Plan are implemented.

Development of the site will provide the surrounding residential and commercial neighborhoods with enhanced water supply and fire hydrant distribution.

SECTION 5
MITIGATION MEASURES & DESIGN CONSIDERATIONS

5.1 – Road and Access Mitigations

5.1.1 Existing Road and Access

The existing public road and access to the Project site have been evaluated and meet the prescriptive requirements and intent of current regulations.

The existing driveways serving the Project Site have a combination of graded, decomposed granite surface and asphalt paving. The driveway was approved, installed, and maintained since the two existing homes on the Project Site were built.

The driveway will be replaced by an approved, all-weather paved driving surface. The roadway replacing the driveway is identified as an as-to-be-named street (Street A). It will have a forty (40) foot wide improved easement and a twenty-four (24') foot wide improved paved surface. Street A will have the capacity to withstand the imposed weight of a 75,000 lb. fire apparatus.

Street A generally overlays the existing driveway and its approved roadway length, which is 960 feet. A cul-de-sac bulb will be constructed at the end of the existing driveway when Street A provisions are provided.

The original length of the existing driveway is based on the size and zoning of the original and undivided parcel, which is 12.78 acres. According to San Diego County Consolidated Fire Code Table 503.2.5.1, parcel sizes with sizes ranging between five and 19.99 acres, are allowed to have maximum cumulative road lengths of 2640 feet.

TABLE 503.2.5.1
DEAD-END ROADS - MAXIMUM LENGTH
(Title 14 SRA 1273.09 Ref.)

Zoning for Parcel(s) Served by Dead-End Road	Cumulative Length of Dead-End Road(s) (Feet)
Less than 1 acre	800
1 acre to 4.99 acres	1,320
5 acres to 19.99 acres	2,640
20 acres or larger	5,280

5.1.1.1 Proposed Mitigations

The San Diego County Fire Authority and Fire Protection District have evaluated the maximum length of proposed Street A.

After review, the FAHJ indicates that the maximum dead-end length of the road is limited to 1320 feet from its intersection with Harbison Canyon Road. The measured length of the road, according to the County of San Diego Scoping Letter dated August 30, 2023, is approximately 1000 feet.

The maximum proposed length of the road is 1060 feet, including the dimensions included in the installation of the cul-de-sac bulb at the terminus of the right-of-way corridor.

Mitigations Provided: *No mitigations are required for the maximum length of the roadway serving the Project Site. The maximum length of the roadway is approximately 1060 feet, which is 260 feet less than the maximum prescriptive length allowed for this development site.*

The proposed road system serves both existing and proposed single-family dwellings. While not specifically adopted by the San Diego County Fire Protection District, roads serving existing single-family dwellings, in some cases, are permitted to provide improved paved width under the prescriptive language of Section 503.2.1.1 of the San Diego County Consolidated Fire Code , *Phasing Requirements for Single Family Dwellings on Existing Legal Parcels.*

Under these provisions, widening an existing, improved, and paved fire access road may be required, or allowed, to meet the width parameters established in Table 503.2.1.1.

TABLE 503.2.1.1 - PHASING REQUIREMENT
Fire Apparatus Access Roadway – Single Family Dwellings

Number of Parcels Served	Unobstructed Road Width	Roadways Over 600 feet Long
1-2	16-foot, paved	Turnouts every 400 feet
3-8	20-foot, paved	Turnouts every 400 feet
9 or more	24-foot, paved	Not required

If implemented, or allowed, for the Project Site, the widening of the proposed Street "A" could be reduced to twenty (20') feet because the road system serves less than eight (8) homes.

Finding: *The required twenty-four (24') foot width of proposed Street "A" exceeds the minimum twenty (20') feet of width published in Table 503.2.1.1, if the FAHJ and Building AHJ would permit the widening to comply with Table 503.2.1.1.*

Finding: The required twenty-four (24') foot width of proposed Street "A" exceeds the minimum twenty (20') feet of width published in CFC Table 503.2.1.1; CFC 503.2, and CCR Title 14 Section 1273.01.

5.1.2 – Proposed Mitigations

5.1.2.1 Private Driveways

All private driveways will be provided with an approved all-weather paved surface.

Driveway slopes shall not exceed 15% without additional mitigation consisting of a minimum of three (3") of concrete that is brushed perpendicular to the driving surface to provide additional traction.

Driveway widths shall have a minimum improved paved surface of sixteen (16') feet and maximum slope shall not exceed 20%.

The angles of approach and departure at the intersection of driveways and roads shall not exceed 7 degrees or a 12% slope.

5.1.2.2 Fire Apparatus Access Road Obstructions

All roads, excluding private driveways, with an improved paved width of less than thirty-six (36') feet shall be considered Fire Apparatus Access Roads (Fire Lanes).

The Fire Code prescriptive language indicates that all fire apparatus access roads/fire lanes shall be provided with red curbs and posted signs that identify the presence of the Fire Lane.

Red curbs shall be supplied with white stenciled letters that are plainly visible from vehicles, which indicate the presence of the Fire Lane and prohibit parking.
Fire Lane Signs shall be posted at appropriate distances apart, further identifying the presence of the Fire Lane and mandating "No Parking" within the Fire Lane.

Signs, posting, red curbs and white stenciling shall comply with the requirements of Section 22500.1 of the California Vehicle Code.

Signs, posts, red curbs and white stenciling shall be maintained in perpetuity.

Typical Approved Fire Lane/No Parking Sign

Proposed Alternative Mitigations

The Project site is being developed for a limited number of single-family residential parcels. As an alternative means of compliance, and to limit financial and maintenance impacts to owners of the existing and future dwellings, the Consultant proposes the following performance-based design alternative to fire lane identification.

1. Identify the presence of fire lanes/fire apparatus access road by installing an approved sign at the entrance to the development site.
2. The language on the sign shall indicate that the road servicing the Project site is a Fire Lane and establishes a no parking stipulation along these roadways.

Typical Alternative Gateway Fire Lane/No Parking Sign

NOTE: The content of the proposed fire lane identification sign does not necessarily need to follow the format and content of the typical sign referenced above. Content and format of the gateway/project entrance sign will be open for discussion with SDCFPD and County of San Diego DPS representatives.

5.1.2.3 Fire Apparatus Access Road Security Gates

The current plans for the Project do not indicate if roadway security gates are proposed.

For future reference, and to mitigate the obstructions and delays typically created by roadway security gates, the following mitigations are recommended. These recommendations must be considered for all future planning of potential security gate installations across proposed Street "A."

Mitigations for electric gate opening systems require an approved emergency key operated switch that overrides all command functions and opens the gate, locking it in the open position.

The emergency gate opening systems allow first arriving and other emergency resources to enter the property without unreasonable delays or obstructions.

The Fire Code requires all proposed sub-divisions of existing parcels with four or more separate residential lots to provide of an approved emergency traffic controlling strobe

light sensor that will activate the gate on the approach of emergency response vehicles (SDCCFC 503.6).

The automatic gate opener is required to have battery back-up systems *or* manual mechanical disconnects in the event of power failures**.**

Typical Gate Override-Opening System Installation

5.2 – Water Supply Mitigations

5.2.1 Existing Water Supply

The Project Site is serviced by the Padre Dam Municipal Water District. There are three existing fire hydrants on Harbison Canyon Road within 500 feet of the intersection of Street A. The closest existing fire hydrant is approximately ninety-five (95) feet away from this intersection, on the east side of Harbison Canyon Road.

NOTE: The hydrant serving the Rancho Market and Feed building complex is on the opposite side of Harbison Canyon Road, which is a heavily travelled roadway. Use of this hydrant for active firefighting operations on the Project Site will obstruct traffic on Harbison Canyon Road, potentially for extended periods of time. Prescriptive language in the Fire Code recommends not designating fire hydrants on opposite sides of heavily travelled roads as available for serving Projects.

Water delivery infrastructure systems must be capable of providing a minimum fire flow of 2500 g.p.m. for new developments in Very High Fire Severity Areas and Wildland-Urban Interface zones. The Padre Dam Municipal Water District Form 399W indicates that the Water District will confirm fire flow and pressure in existing and future water mains serving the Project site in the future.

The water delivery infrastructure along Harbison Canyon Road is served by a 16" PVC main.

SUMMARY OF FIRE PROTECTION WATER MAIN HYDRAULICS

Pipe ID	Flow Rate	Velocity (fps)	FLR (psi/100')	Maximum Flow
10"	2500	10.3	1.1	2500
12"	2500	7.2	0.5	4000
16"	2500	4.5	0.2	10,000
16"	10000	18.2	2.1	10,000

Hypothetically, placing a water source for a 16" ID PVC water main, four miles away from the Project Site results in an internal friction loss rate of 42.24 psi.

Hypothetically, to achieve a minimum flow of 2500 g.p.m. at the minimum residual pressure of 20 psi, with sufficient main pressure to overcome 43 psi of internal friction loss, the water supply source must be installed a minimum of 130 feet above the project site without installing a fire pump.

170 feet/0.434 per 1 psi = 73.78 psi at discharge port of hydrant.

For adequate fire flow and pressure requirements (120 p.s.i. static pressure at the hydrant discharge port), it is recommended that the water supply source be located a minimum of 275 feet above the project site.

For adequate fire flow and pressure in the on-site fire water distribution mains, the minimum required internal pipe diameter is 10" for PVC piping:

- Using a 10" pipe to feed the 1000-foot-long fire water system on the Project Site results in an internal friction loss rate of eleven (11) psi.
- Using 12" pipe to feed the 1000-foot-long fire water system results in an internal friction loss rate of five (5) psi.
- The pipe size analysis does not include additional internal friction loss rates for pipe fittings, adaptors, and valve attachments.
- The pipe size analysis also does not include pressure changes created through gravity loss (adding pressure for elevation increases) or gravity gain (reducing pressures for elevation decreases)

The following minimum effective pressures, not including valving, pipe fittings and adaptors, for the Project Site are estimated at:

- For Project Site system using 10" pipe, with 120 psi static pressure = 42.24 psi (FLR from source to Site) + 11 psi = 53.24 psi; this provides 66.76 to overcome other FLR and typical aging factors applicable to fire water distribution service mains.
- For a 10% planning safety factor, which predicts flow demands for any future development in the area, 59 psi is needed at the hydrant discharge port; this provides 41 psi to overcome other FLR and typical aging factors applicable to fire water distribution service mains.

- For Project Site system using 12" pipe, with 120 psi static pressure = 42.24 psi (FLR from source to Site) + 5 psi = 47.24 psi; this provides 72.76 psi to overcome other FLR and typical aging factors applicable to fire water distribution service mains.
- For a 10% planning safety factor which predicts flow demands with any future development in the area, 52 psi is needed at the hydrant discharge port; this provides 48 psi to overcome other FLR and typical aging factors applicable to fire water distribution service mains.

NOTE: *The above minimum calculations do not include flow and pressure requirements created by the Padre Dam Municipal Water District requirement to loop all Project Site water mains. Looping of the mains requires extending the mains 680 feet across the southern project site and back to the Harbison Canyon Road water right-of-way easement.*

- *10" main FLR increase – 7.48 psi*
- *12" main FLR increase – 3.4 psi*

5.2.2 Proposed Mitigations

Comments from the San Diego County Fire Protection District indicates that fire hydrants shall not be more than 625 feet from any existing or proposed buildings on the Project Site.

Initial comments from the Padre Dam Municipal Water District require that an approved, looped water delivery main be provided to service the Project Site.

The water infrastructure should be tied into the existing 16-inch main on the north side of Project near the intersection of Harbison Canyon Road and proposed to-be-named Street "A." The new underground piping system will follow the layout of Street "A" corridor until reaching the terminal cul-de-sac bulb. At this point, at the southern portion of the Project Site, the main will loop back in an easterly direction for a second connection point to the existing water main under Harbison Canyon Road. Looping the main serves the purpose of providing two sources of water supply to the fire hydrants and lower friction loss rates in the piping system.

The consultant has analyzed the configuration and dimensions of the Project Site and recommends the following placement of fire hydrants to comply with the District's requirement.

Two fire hydrants are recommended to meet the Fire District requirements for spacing and distances from existing and proposed buildings:

1. Fire Hydrant # 1 – installed on the north side of Street A, opposite the private driveway entrance for the Remainder Lot. This hydrant is approximately 335 feet north of the Harbison Canyon Road and Street A intersection.

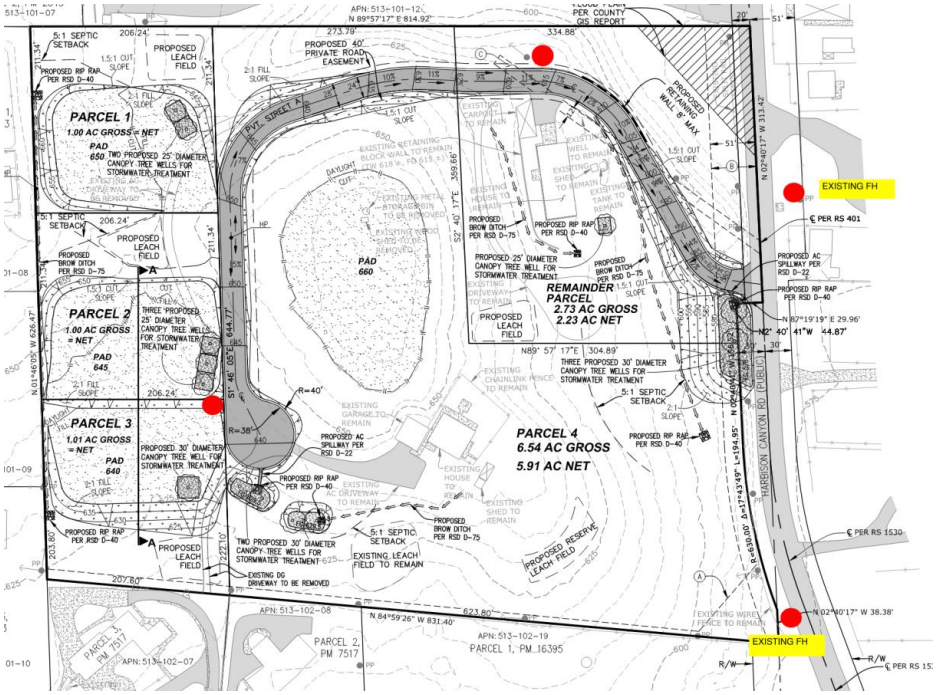
2. Fire Hydrant # 2 – installed on the west side of Street A at the Parcel 2 and 3 shared property lines at the entry point to the terminal cul-de-sac bulb.

Locating fire hydrants at these locations limits potential obstruction of the roadway by fire water supply hose lines, which when deployed, may hug the shoulder of the inbound traffic lanes to the Project Site or, will form an undulating pathway back and forth across the roadway corridor.

Fire hydrant # 1 effectively serves the house on the Remainder Parcel and proposed parcel # 1, which is approximately 410 feet away.

Fire hydrant # 2 serves Parcels 2, 3 and 4. The hose pull/lay distance from Hydrant # 2 to the existing house of Parcel 4 is approximately 220 feet.

NOTE: An alternative placement of one fire hydrant, located at Fire Hydrant # 1's proposed location, was considered for cost savings purposes. The hose pull/lay distance from a singular fire hydrant at this location exceeded the maximum allowance of 625 feet by 237 feet (total 862 feet) for the existing house on Parcel # 4.



Proposed and Existing Fire Hydrant Locations

5.2.3 Alternative Water Supply Mitigations

In the unlikely event that the existing water delivery infrastructure system cannot provide Fire Code compliant fire flows and adequate pressures, the following performance-based methods, as prescriptively described in the San Diego County Consolidated Fire Code, are recommended.

Water supply for fire protection systems on Project Site parcels can be provided in one of three forms:

- Well-based systems with fire water storage tanks
- Modified municipal water delivery infrastructure supplemented by permanent fire water storage tanks.
- A custom manifolded water delivery system using either wells or water distribution infrastructure supplied water, delivered into permanent fire water storage tanks with hydrant located strategically on individual lots, shared lots, or a private fire hydrant delivery system.

For well-based systems, water from a well, or wells, is used. Water drawn from the aquifers will be stored in approved fire-water storage tanks strategically located on each parcel.

Well water infrastructure delivery systems shall be provided with listed and approved pumps capable of producing sufficient flow rates and pressures needed to adequately support NFPA-13D residential fire sprinkler systems.

5.2.3.1 Fire Water Storage Tanks

San Diego County has published a *Water Tank Standards for Fire Protection Documen*t (CFA # 600).

This Standard provides *minimum* water storage requirements for dwellings and other structures where adequate public or private water supply is not available.

Previous editions of the San Diego Consolidated Fire Code (Table 903.3.2) indicates that a fire flow of 250 g.p.m.*is acceptable* where the exposure distance to a Project building *from an adjacent property* is one hundred (100') feet.

TABLE NO. 903.3.2			
Building Square Feet	Gallons Per Minute Water Flow	Capacity Gallons	Duration Minutes
Up to 1,500 Over 1,500	250 250	5,000 10,000	20 40
When exposure distance is one hundred feet (100') or less from adjacent property, the following minimum fire flow shall be adhered to. Increases in water storage may be required by the Chief, depending on the square footage of the exposed structure. When protecting exposures within 100 feet or less, the minimum flow duration shall not be less than two (2) hours unless otherwise approved by the Chief.			
EXPOSURE DISTANCE	**MINIMUM FIRE FLOW**		
Over 100 Ft. 31 Ft. – 100 Ft. 11 Ft. – 30 Ft. 10 Ft. or less	250 Gallons Per Minute 500 – 750 Gallons Per Minute 750 – 1000 Gallons Per Minute 1000 – 1500 Gallons Per Minute		

NOTE: *ISO Fire Flow Determine Guidelines Manual Table 330A(1) indicates that separation distances between buildings greater than forty (40') feet are not a fire exposure threat to adjacent buildings and structures.*

The current edition of the San Diego County Consolidated Fire Code prescriptively indicates that water tanks for private residential fire protection *shall* comply with Table 507.2.2 (see above). Tanks shall be installed according to NFPA 22 edition prescriptive requirements.

Findings:

1. *The provisions of the San Diego County Consolidated Fire Code are local amendments to the California Fire Code.*
2. *The San Diego County Consolidated Fire Code is based on articulable local conditions and determinations.*
3. *The San Diego County Consolidated Fire Code, as adopted, amended, and approved by the California Building Standards Commission, is enforceable and its provisions may override the base line prescriptive requirements of California Fire Code language.*
4. *The Consolidated Fire Code indicates that extending fire mains to provide public or private fire hydrants is not required if water mains feeding a fire hydrant system is more than 1500 feet away from the development/Project site.*
5. *Table 507.2.2 of the San Diego County Consolidated Fire Code establishes required fire flow rates and fire water storage tank capacities.*

5.2.3.1.1 Fire Water Storage Tank Prescriptive Requirements

The elevation of the bottom of tanks shall be equal to, or higher than, the fire department connection on the premises and/or the building pad. Regardless of domestic water use and storage, all tanks shall be equipped with an automatic fill device that ensures that the tank contains the amount of water needed for fire flow duration.

Tank size may be increased to serve multiple structures on a single parcel.

The tank outlet pipe supplying water to the fire department connection shall have a minimum 4-inch diameter. The outlet supply pipe shall extend from the base of the tank to the outlet at the fire department connection. All underground piping serving the fire department connection shall be NFPA 24 listed and approved.

The fire department connection shall have an approved means of controlling water flow. The fire department connection shall be at least one 4-inch National Standard Thread (male), reduced to one 2½-inch National Standard Thread (male). More outlets may be needed.

The location of the fire department outlet shall be shown on plans submitted to the FAHJ. Consideration will be given to topography, elevations, and distance from structures, driveway access, and prevailing winds.

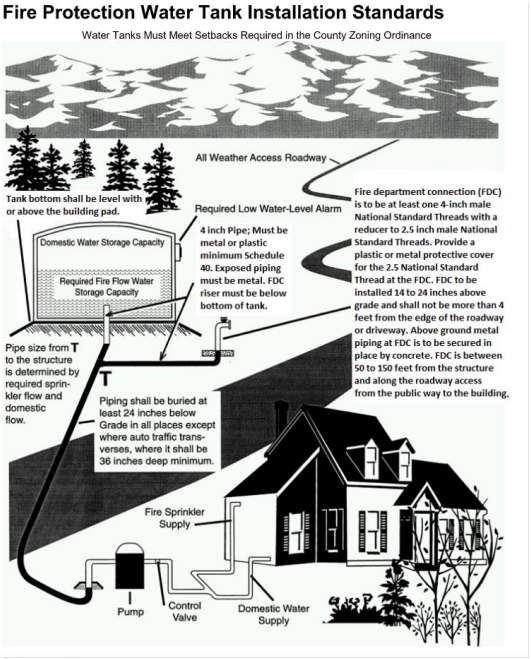
The fire department connection outlet shall be located along a fire apparatus access roadway. The FDC location shall have a minimum fifty-foot and maximum 150-foot separation distance from the buildings they serve.

All exposed tank supply pipes shall be listed for above-ground use. Adequate support shall be provided.

Water storage tanks shall be constructed from materials approved by NFPA 22 and installed per the manufacturer instructions.

Plans shall be submitted to the FAHJ for approval prior to tank installation. Tanks shall be installed as per County Zoning setback requirements.

Tanks or vessels previously used for products other than water shall not be allowed to serve as fire protection water storage tanks.



5.2.3.1.1.1 Fire Pumps

Listed and approved fire pumps are required to deliver adequate pressure and fire flow from water storage tanks to the remote fire department connection(s) and to the automatic fire sprinkler systems installed in buildings. Typically, the fire pumps are electric drive units requiring an outside source of electrical power for operation.

A review of the prescriptive requirements for residential fire sprinklers does *not* mandate the installation of an emergency power supply source for fire pumps.

During major wildfire events, or as preemptively occurs during Santa Ana-northeast wind weather events, the first built-environment infrastructure system that fails, or is taken out of service, is electrical distribution in threatened or exposed communities and undeveloped areas. Thus, automatic fire sprinkler systems, which are relied on to control or extinguish interior fires starting from wildfire exposures, will not engage or deliver adequate fire flow and pressures.

5.2.3.1.1.2 Fire Pump Power Supply Recommendations

While *not* prescriptively mandated, to ensure the proper operation of residential fire sprinkler systems, the Consultant *strongly* recommends installing one of more of the following energy storage systems or emergency power sources:

- Emergency generator with sufficient capacity to run the fire pump.

    - Gasoline driven internal combustion engine.
    - Diesel driven internal combustion engine.
- Photovoltaic arrays, with a circuit dedicated to fire pump emergency electrical power supply for a reasonable duration.
- Uninterrupted Power Supply (UPS), with adequate capacity to run the fire pump for a reasonable duration.

5.3 – Ignition Resistant Construction and Automatic Fire Sprinkler Mitigations

5.3.1 Existing Structures

There are two existing structures at the project site.

Analysis of the existing buildings, both being single-family-dwellings, indicates they were not built to California Building Code Chapter 7-A and SanDiego County Enhanced Fire Resistive Construction Standards.

California Building Code Chapter 7-A and the County's Enhanced Fire Resistance Construction Standards were implemented following the 2003 Cedar Fire Santa Ana Wind Event incident. Both prescriptively apply to only new buildings and not to existing buildings.

Chapter 1 of the California Building Code, under specific circumstances, prescriptively limits the imposition of new regulations on existing buildings:

101.4.7 Existing buildings. The provisions of the California Existing Building Code shall apply to matters governing the repair, alteration, change of occupancy, addition to and relocation of existing buildings.

102.6 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code, the California Existing Building Code … or the California Fire Code.

With this prescriptive and codified language, an existing structure is generally "grandfathered" to be considered approved with code adoption, provided that the building meets a minimum level of safety.

A specific level of safety in existing buildings is dictated by maintenance and hazard abatement provisions in the California Building, Existing Building and Fire Codes.

The applicability of the Codes to existing structures is set forth in the CEBC and is limited to *new* work or *changes in use* that occur in these buildings.

FINDING: *If an existing building exhibit a reasonable degree of fire protection against the impacts of wildfire and complies with the general intent of prescriptive fire*

safety regulations, they may continue to be used and occupied without changes to their use, condition, and construction.

FINDING: *If an existing building does not a reasonable degree of fire protection mitigations against the impacts of wildfires, or if there is new work being performed, of if the building's use is modified, the building can be, and generally will be, required to meet the most current prescriptive requirements of the Fire, Building and Existing Building Codes.*

5.3.2 Proposed Mitigations, New Buildings

All *new* buildings and structures shall be provided with automatic fire sprinklers complying with National Fire Protection Pamphlet 13-D - *Fire Sprinklers for One- and Two-Family dwellings.*

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for *Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas* and California Building Code Chapter 7-A construction standards.

Roof composition is an important factor in structural survivability. Research indicates that typical single-family dwellings with non-combustible roofs and thirty-three (33) to sixty-six (66') feet of fuel clearance have a 95% chance of survival (Howard, et.al., 1973).

Additional research in Santa Barbara County revealed that houses with a non-combustible roof and thirty-three (33) to sixty (60) feet of vegetation clearance had an 86% chance of survival (Foote, 1994).

The proposed single-family dwellings in the project require Class A non-combustible roof decks or assemblies**.**

The above Power Point slide, from a presentation given by the San Diego County Fire Marshal's Office to the San Diego County Fire Prevention Officers Association, indicates a 96 to 98% survivability rate for buildings erected under "Enhanced Fire Resistive Construction" (Chapter 7A Ignition Resistant Construction) requirements during actual, extreme fire behavior conditions in similar and more hazardous vegetation types than found on the project site.

Examples of detailed, but not-all-inclusive, requirements for building construction in Very High Severity Areas are included in ***Appendix E.***

5.3.2.1 Recommended/Proposed Mitigations for Additional As-Needed Defensible Space Limitations

The following performance-based design mitigations may be considered as alternate means and methods of compliance if other defensible space deficits are identified during the development of the Project.

5.3.2.1.1 Enhanced Exterior Wall Fire Resistance Rating

The basic provisions of California Building Code Chapter 7-A require the exterior walls of all buildings in Very High Fire Severity Areas to comply with one of the following requirements:

A. Non-combustible materials
B. Ignition resistant materials
C. Log wall construction assemblies
D. Heavy timber construction materials
E. Wall assemblies that withstand a 10-minute direct flame exposure contact test, as required by California State Fire Marshal Standard 12-7A-1.

SFMO Standard 12-7A-1 consists of exposing proposed exterior wall assemblies with a 150-kilowatt direct flame contact for 10-minutes.

Typically, the County Consolidated Fire Code and County Building Code require all exterior wall surfaces to be constructed of both non-combustible and ignition resistance materials, such as stucco or concrete masonry units (CMU; concrete blocks) .

One of the exceptions to the ignition resistant or non-combustible wall surfaces is providing a 1-hour fire resistive wall assembly.

Single-family residences typically have Type V construction.

For Type V-A construction, California Building Code Tables 601 requires exterior bearing walls to have a 1-hour FR rating.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT	1[b]	0
Bearing walls Exterior[e, f] Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 1/2[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

California Building Code Table 602 requires a Type V, Group R residential occupancy to have 1-hour FR-rated walls when the Fire Separation Distance from adjacent buildings is less than thirty (30') feet.

Fire Separation Distance is defined by the CBC as the distance measured from the building face to one of the following:
1. The closest interior lot line.
2. To the centerline of a street, an alley or public way.
3. To an imaginary line between two buildings on the lot.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCY GROUP F-1, M, S-1[f]	OCCUPANCY GROUP A, B, E, F-2, I, R[i], S-2, U[h]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA Others	3 2	2 1	1 1
10 ≤ X < 30	IA, IB IIB, VB Others	2 1 1	1 0 1	1[c] 0 1[c]
X ≥ 30	All	0	0	0

Table 602 establishes the minimum fire-resistance ratings for both load-bearing and non-load-bearing exterior walls based on fire separation distance, as defined in CBC Section 202. These required ratings are based on the fuel load, probable fire intensity of the occupancy classifications and the physical separation between the exterior wall and the line used to determine fire separation distance.

Table 602, Note i, indicates that Group R-3 buildings of Type IIB or Type VB construction, are *exempted* from the exterior wall fire resistance rating *where the fire separation distance is 5 feet or greater*.

This note clarifies the requirements for exterior wall protection for Group R-3 occupancies of Type IIB and Type VB construction.

Where CBC Table 705.8 allows unlimited area of unprotected openings, a fire-resistive rating at non-bearing exterior walls is not required per Note "h." For most occupancies, this is determined by the table.

For Group R-3, Table 705.8 Note "f" addresses wall requirements.

Bearing walls of Type IIB and Type VB construction are not required to be rated according to Table 601. Therefore, Table 602 is the controlling prescriptive requirement for bearing and nonbearing walls in these types of construction.

For practical purposes, Fire Separation Distance can be considered an equivalency of exposures for exterior walls for on- or off-site unmanaged vegetation fuel beds.

5.3.2.1.2 Recommended Ignition Resistant Exterior Wall Mitigation

While not required by the California Building Code and given the State Fire Marshal provisions that exterior walls must withstand a ten (10) minute long direct flame contact exposure, the Consultant strongly recommends installing minimum 1-hour fire resistant walls on all sides of single-family residence requiring additional mitigations.

***Finding**: The 1-hour (sixty-minute) rated walls will provide the dwelling with a minimum of six (6) times the protection provided by California State Fire Marshal test criteria parameters for a ten (10) minute rated wall.*

5.3.2.1.3 Additional Enhanced Building Construction Mitigations

1. If required, provide automatic fire shutter systems on exposed windows and doors with windows.

Typical Window Fire Shutter Assembly

2. Install and extend the automatic fire sprinklers system to provide exterior perimeter coverage of exposed walls, windows, and doors.

Finding: *The building standards proposed by this Fire Protection Plan will provide a reasonable degree of ignition resistant buildings at the project site and reduce the Significant Impact caused by less fire resistive construction methods and standards.*

5.3.2.1 Residential Solar Systems

The County of San Diego routinely requires new land development and construction of new buildings to provide a minimum of 10% of the roof surface area with permanently installed residential solar panel systems.

The following provides basic information about 1) the impact of solar panel system installations and 2) how they potentially impact Fire Department operations and safety.

5.3.2.1.1 System Identification Markings

PV systems must be provided with identification marking systems. Marking provides emergency responders with appropriate warning and guidance about working around and isolating the solar electric system. Materials used for marking the system components must be weather resistant.

Locations or equipment to be identified:

- Main Service Disconnect
- Direct Current Conduit
- Raceways
- Enclosures
- Cable Assemblies
- Junction Boxes

Marking should be placed on all interior and exterior DC conduit, raceways, enclosures, and cable assemblies, every 10 feet, at turns and above and/or below penetrations and all DC combiner and junction boxes.

5.3.2.1.2 Access, Pathways and Smoke Ventilation

Access and spacing requirements should be observed to:

- Ensure access to the roof.
- Provide pathways to specific areas of the roof.
- Provide smoke ventilation opportunities area.
- Provide emergency egress from the roof.

Roof access points are defined as areas:

- where ladders are not placed over window or door openings

- located at strong points of building construction.
- locations where there are no conflicts with overhead obstructions.

5.3.2.1.3 Residential Systems—Single and Two-Unit Residential Dwellings

5.3.2.1.3.1 Access/Pathways

Residential Buildings with hip roof layouts: Modules should be provided in a manner that provides one (1) three-foot (3') wide clear access pathway from the eave to the ridge on each roof slope where modules are located. The access pathway should be located at a structurally strong location on the building (such as a bearing wall).

B. Residential Buildings with a single ridge: Modules should be placed to provide two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where modules are located.

C. Hips and Valleys: Modules should be located no closer than one and one half (1.5) feet to a hip or a valley if modules are to be placed on both sides of a hip or valley. If the modules are to be located on only one side of a hip or valley that is of equal length, then the modules may be placed directly adjacent to the hip or valley.

5.3.2.1.3.2 Smoke Ventilation

The modules should be located no higher than three feet (3') below the ridge.

5.4 - Defensible Space and Fuel Modification Mitigations

Ideally, establishing Code compliant defensible space and fuel modification zones around buildings removes and modifies the existing highly flammable natural vegetation, creating an entirely different fuel model most resembling Suburban Development (NB-1).

Fuel Model NB-1 includes lands suburban development that will not support wildfire spread. However, buildings in Fuel Model NB-1 lands may experience structural fire losses during vegetation fires. Structural ignitions usually occur from building-to-building exposures or from firebrands, neither of which are modeled by current Fuel Model parameters.

Fire behavior, under these mitigations strategies, is expected to significantly diminish when a wildfire encroaches upon the Fuel Modification Zones at property lines exposed to off-site unmanaged vegetative fuels**.**

Vegetation management beyond a structure's immediate vicinity has little effect on house ignitions unless a minimal break of continuous surface fuels is maintained around the perimeter of the house. For this reason, home site protection includes eliminating continuous ground fuels that lead from wildland fuel beds to the house. This can be

accomplished with rock landscaping, cement sidewalks, green grass or by removing dried vegetation and tree needles (Jack Cohen, USFS).

In 1997, Cohen conducted full-scale experiments that revealed that a typical Type V-B combustible wooden-walled building thirty-three meters (100 feet) from a crown fire in 43 foot (13 meter) tall Black Spruce trees would ***not*** ignite and sustain open flame combustion from radiant heat fire exposures.

These experimental fires produced flame heights of 20 meters or 65.616 feet.

By evaluation and formulaic calculations, twenty-meter-long flame heights are produced by a 100-megawatt fire.

During the experiments, wooden walls placed ten meters (33 feet) from the fire front ignited *only with direct flame contact*. There was some evidence of surface charring, but the damage immediately stopped after the flame front burned out.

Finding: *These full-scale fire tests are the basis for the 100-foot-wide Fuel Modification Zones mandated by the County of San Diego and State of California.*

5.4.1 – Analysis of Proposed Defensible Space Mitigations

Depending on the local environment, chaparral, and shrub fuel beds in San Diego County produce 3.5502631035-megawatt fires. This heat release rate is approximately 3% of the energy produced by Cohen's full-scale test fires.

The BEHAVE Fire Modeling calculations for the Project Site indicates that a wildfire moving through Fuel Model SH-2 Dry Climate Moderate Load Shrub (chaparral/brush/shrub) will produce a Fire Line Intensity of 1629 BTU5/foot/second. This value, and others, can be applied to determine ignition times for residential construction materials.

Using the National Fire Academy Fire Dynamics formula $t_{ig} = \pi \, kpc \, (T_{ig} - T_o) / 2q_e$

where:

t_{ig} = time to ignition, seconds
kpc = thermal inertia of material
T_{ig} = temperature of ignition source
T_o = surface temperature of exposed material
q_e = incident heat flux to the material

The ignition time of solid materials can be estimated.

The BEHAVE Fire Modeling Calculation shows that worst-case Fuel Model SH-5, Dry Climate Heavy Load shrub fuels in San Diego County, under 2003 Cedar Fire Event

burning conditions, typically produce 2868 BTUs, equivalent to 3025 watts or **3.025 kilowatts**.

Fuel Model SH-5 represents potential fire characteristics of the unmanaged off-site vegetative fuel bed in the vicinity of the Project Site. This Fuel Model is applicable to the mountain sides west pf the Project Site, which exposes the developed residential areas to unmanaged vegetation conditions.

For a worst case scenario using these variables, a gypsum-based, one-hour fire resistive or non-combustible stucco plaster wall (as required by Chapter 7A of the County and California Building Codes) with a surface temperature of 100 degrees (solar exposure), having a kpc of 5.8 x 10^5 q_e (*Fire Dynamics,* pg. 2-15), exposed to radiative heat from a 1400 degree flame front thirty feet (30') away producing 2868 BTUs, the ***theoretical*** ignition time (using CBC Chapter 7-A required fire resistive materials) would be 211 minutes or ***3.53 hours***.

Finding: *Anecdotal information from the Fire Service indicates that a flame front, under "fire storm conditions" exposes a building to maximum extreme convective and radiant heat and potential direct flame contact for a maximum period of ten to thirty minutes.*

Finding: *Cohen' experiments indicated that the actual maximum flame front exposure to radiant and convective heat for exterior wooden walls was* ***two*** *minutes***.**

Finding: *Cohen's experiments indicated that the actual maximum flame front and radiant and convective heat exposure needed to ignite exterior* ***wooden*** *walls had to impact buildings for* ***fifteen (15) to twenty (20) minutes***.

Referring to *Fire Dynamics* Figure 2-5 (table below), *Heat Flux Values*, fires crossing onto the Project Site from adjacent properties will *not* produce sufficient radiant heat to cause significant damage to proposed or existing single-family dwellings.

Damage Description	**Heat Flux – kW/m²**
Skin burns	4.7 to 5.0
Pain threshold	1.5
Pain at one minute	2.1
Plastic melts	12.0
Cable insulation degrades	18.0 to 20.0
Piloted ignition occurs:	
Wood	**14.6**
Painted Wood	**16.7**
Wood spontaneously ignites	**33.5**

Type of Heat Exposure	**Heat Flux Value**
Flame Radiation	0-200 kW/m²
Flame Convection	10-20 kW/m²
Hot Gas Convection	0-10 kW/m²
Hot Gas Radiation	0-150 kW/m²

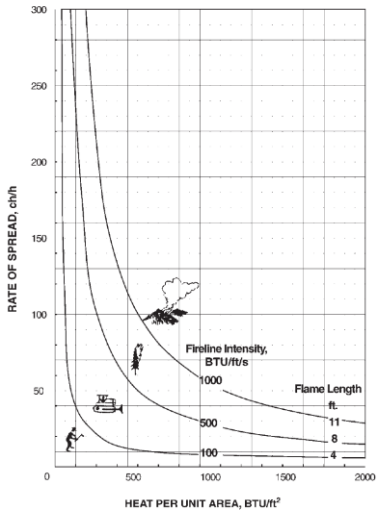
While typical Fuel Model SH-5 (Coastal Sage shrub) vegetation in San Diego County produces long flame lengths (41.1 feet) and high burning intensities (+2235 BTU/sq. ft.), fire behavior changes when the flame front transitions into FMZ-1 defensible space irrigated landscaping.

BEHAVE fire modeling for irrigated Fuel Model GR-1 lawns, with 15 to 30% fuel moisture levels, will *not* ignite or produce a flame front that will spread across the landscape.

Other sources indicate that irrigated lawns have fuel moisture content up to 120%.

120% fuel moisture results in green, non-cured vegetation, with all herbaceous materials remaining in the "live" fuel condition. As a result, grassy fuels with high fuel moisture theoretically could produce flame lengths of one (1') foot, or less. The rate of spread would be less than five (5) chains (330 feet) per hour if exposed to a 20 m.p.h. mid-flame wind.

The fire behavior characteristics of irrigated grass fuels are well within the capabilities of fire suppression forces using non-mechanized firefighting tools to control fires. The change of burning characteristics and intensity as fire moves across the irrigated grass will provide firefighters better opportunities to take defensive suppression action in the Fuel Modification Zones around the proposed and existing buildings on the Project Site (***see the Fire Behavior Characteristics Chart below and Appendix E, pages 142 and 143)).***



Finding: *When met, the Fire Protection Plan provisions for Fuel Modification Zones and Defensible Space will meet or exceed the reduction of Significant Impacts in this category.*

Unmanaged Fuel Model SH-5 vegetation on undeveloped lands will produce a heat release rate of 2235 BTU/square foot or 2358 kW/square feet of biomass.

Using the formula:

$q = X_r Q / 4\prod R_o^2$ where:

q = Incident radiation on a wall surface (heat flux, kW/m^2)
X_r = radiation fraction (0.1 to 0.6)
R_o^2 = distance from target wall surface

The amount of radiant heat energy striking a surface, and leading to ignition, can be found.

As an example, the heat flux for a separation distance of 113 feet (34.44 meters) from SH-5 Vegetation is determined as:

$q = X_r Q / 4\prod R_o^2$
$q = 0.5\ (2358) / 4\ (3.14)\ (34.44\ meters)^2$
$q = 0.5\ (2358) / (12.56)\ 1186.1136)$
$q = 1179 / 14897.58682$
$q = 0.079\ kW/m^2$

Referring to National Fire Academy *Fire Dynamics* Table 2.1/, *Radiation Effects*, a fire approaching project building pad from unmanaged vegetation will ***not*** produce sufficient radiant heat to cause significant damage to proposed and new dwelling.

Table 2-1 Radiation Effects

Damage Description	Heat flux kW/m^2
skin burns	5.0
Pain threshold	1.5
Pain at 1 minute	2.1
Plastic melts	12
Cable insulation degrades	18.0-20.0
Piloted ignition occurs:	
Wood	14.6
Wood with paint	16.7
Wood	25.0
No 2. Fuel Oil	20.0 at 40 sec
No. 2 fuel oil	10.0 at 120 sec
Wood spontanenous ignites	33.5
Equipment damage	37.5

Using another example, the heat flux for a separation distance of 149 feet (34.44 meters) from SH-5 Vegetation is determined as:

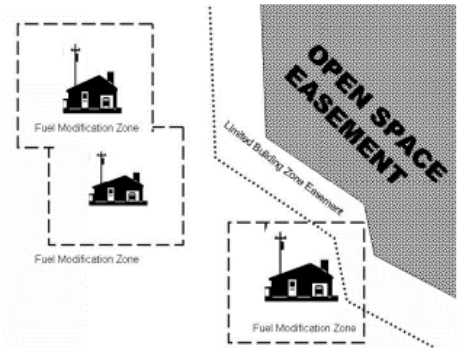
$q = X_r Q / 4\prod R_o^2$
$q = 0.5 (2358) / 4 (3.14) (45.4152 \text{ meters})^2$
$q = 0.5 (2358) / (12.56) 2062.540391)$
$q = 1179 / 25905.50731$
$q = 0.045511558 \text{ kW/m}^2$

Table 2.1 also indicates that a fire, with the above characteristics, will ***not*** produce sufficient radiant heat to cause significant damage to proposed and existing dwellings.

5.4.1.1 Mitigations for Open Space Easements, If Required.

Limited Building Zones provide a landscape barrier between designated Biological Open Space Easements or Preserves. Generally, there are no building encroachments inside of LBZ perimeters.

Unlike fuel modification defensible spaces, which prevent fires spreading across the landscape from reaching and or igniting exposed buildings, the prescriptive intent of a LBZ is to mitigate and prevent fires starting in buildings from spreading to the sensitive or protected vegetation in an Open Space habitat.



The County of San Diego Fire Protection Plan Reference Guidelines indicate that Limited Building Zones ***can*** be used for *required* defensible space perimeters and ***allows*** encroachment into the LBZ for *mutual protection* of buildings and unmanaged vegetative fuels beds in Open Space Easements.

Using these guidelines, if an Open Space Easement is required on the Project Site, additional defensible space could be provided would enhance the protection afforded to the Open Space Easement by lowering the risk of building fire caused ignitions in the unmanaged fuel beds. (***see Section 4.7.3 for MOU Open Space Easement Protection and Mitigation Guidelines)***

5.4.1.2 Alternative Protection Using Installation of Flame and Heat Deflection Walls

Another potential mitigation is the erection of Concrete-Masonry-Unit (CMU) block retaining walls around the perimeter of proposed pads with site constraints not allowing for full 100-feet of defensible space *or* safe separation distances from vegetation with potentially high to extreme fire behavior characteristics.

Defensible space site constraints may mandate installation of recommended flame/heat deflection walls, if required by the FAHJ, on Parcels 3 and 4 and the Remainder Parcel to mitigate for potential Fuel Model SH-5, Dry Climate Heavy Load Shrub vegetation exposures to buildings.

5.4.1.2.1. Basis of Design, Flame/Heat Deflection Walls

Many areas in California (i.e., San Diego County, San Diego City, City of Encinitas, Riverside County, San Bernardino County, and L.A. County) allow using concrete block walls for radiant and convective heat protection when site constraints limit the depth of fuel modification zones.

In these cases, non-combustible walls are placed between the building and vegetation as an alternate means of compliance to protect Project buildings from unusual fire exposure problems when other mitigations may be inadequate.

These walls are either solid block walls or a combination of CMU blocks and tempered glass view panels. When used, tempered glass view walls act as fire resistive rated panels.

Concrete Masonry Unit block walls are a non-combustible construction material which have excellent fire resistive properties.

The fire resistive characteristics of concrete block walls are well established by testing and are a function of the types of aggregates used to manufacture the blocks and their thickness. CMU blocks are manufactured with a blend of aggregate types; this condition is discussed by the ICC and the International Building Code by referencing Standard TMS-216.

FIRE RESISTIVE RATING OF 60% GRAVEL 40% PUMICE AGGREGATE BLEND CMU WALLS

Nominal Block Width (in.)	Block Cell Treatment	
	Partial Fill Cells	Solid Fill Cells (1)
4	1 hour	1 hour
6	1 hour	4 hours (2)
8	2 hours	4 hours
10	3 hours	4 hours
12	4 hours (2)	4 hours

(1) – Cells can be filled with grout, loose fill insulation or aggregate meeting ASTM C-33 or C-331 requirements
(2) – If the aggregate blend is changed to 70-30 to produce a denser architectural unit, the fire rating is decreased to three hours.

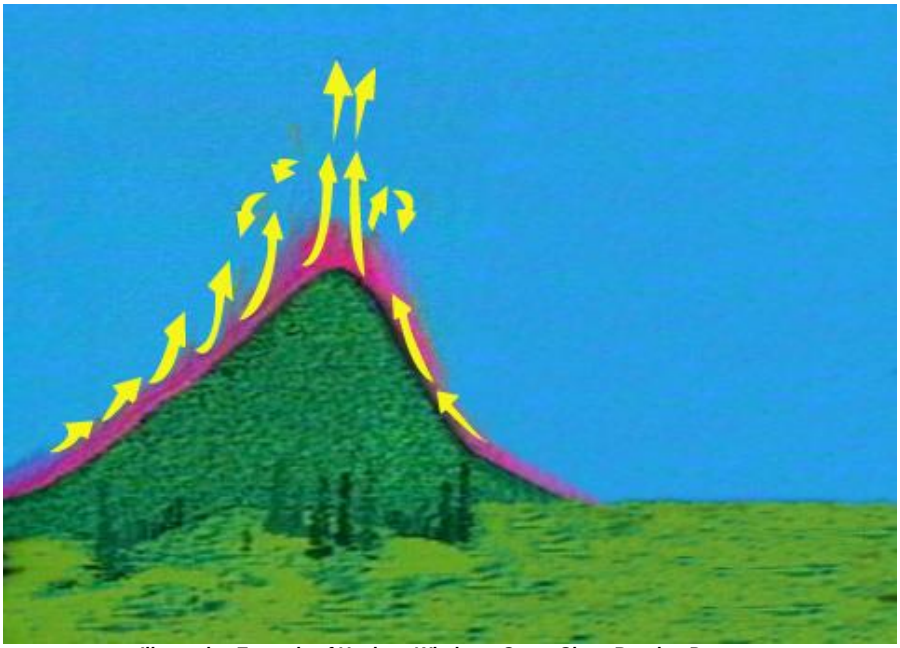
At minimum, concrete block walls have a one-hour fire-resistive rating.

When a flame front moving across the landscape encounters the wall, a drastic reduction of fuel occurs. With this sudden lack of fuel, there is an immediate reduction in rate of spread and heat production; active and aggressive fire progression will stop, and the heat released will be deflected and expended upward into the atmosphere.

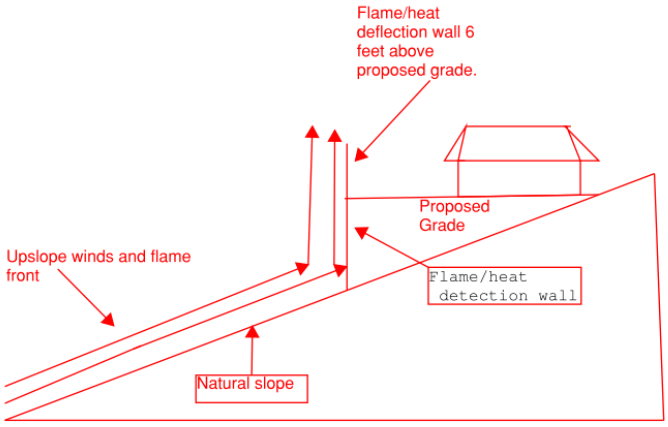
These walls are extremely effective when used at the top of slopes where light and moderate fuels are present. The extreme fire behavior produced by high winds also bends the flame front over, so it travels more parallel to the ground. With strong wind velocities, the flame angle increases, making flame/heat deflection walls much more effective.

The retaining/heat deflection walls, and the land and slopes on the Project Site, are subjected to hours-long solar radiation heating. Upper slope and vertical surfaces will receive more radiant heating than the base of the slope, increasing the ground and fuel temperatures in the upper regions. The differential in temperatures between upper and lower levels of slopes induces convective upslope wind patterns, with the atmosphere naturally seeking equilibrium between disparate air pressures.

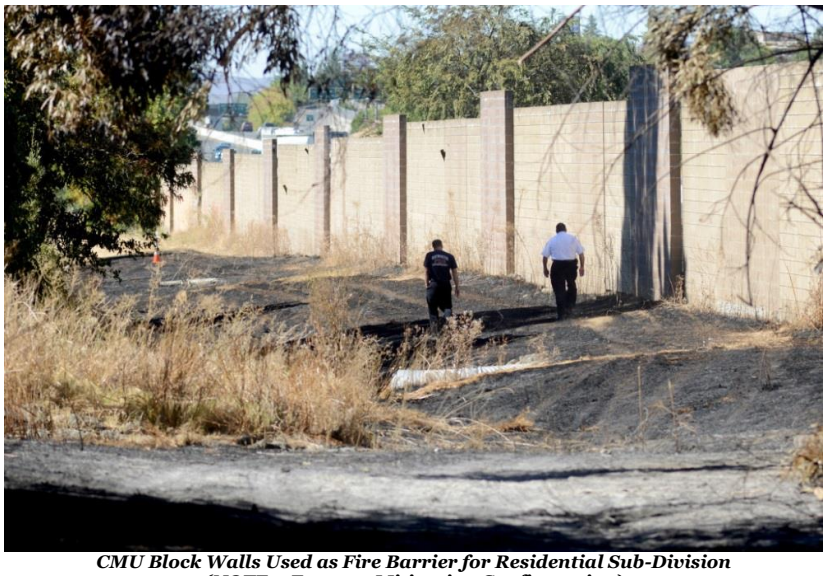
Flame fronts influenced by normal and Santa Ana wind patterns will move across the slope until they encounter the walls. Updrafts from slope convective heating, and a drastic reduction in available fuels, will create a vertical wall of air and wind pressure at the retaining walls that interrupt normal cross-slope wind influence on fire spread. The upslope winds will tend to push the fire back on itself at the edge of the walls. Under the influence of upslope and cross-slope winds, the fire will seek a travel path with the least resistance, and subsequently move back and away from the vertical walls and into other nearby vegetation.



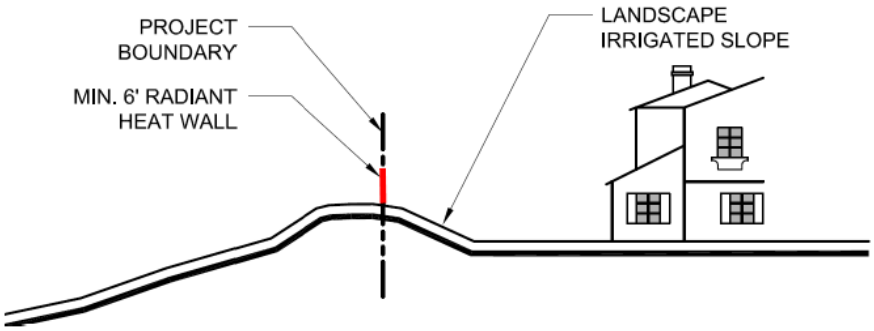
Illustrative Example of Upslope Winds on Cross-Slope Burning Patterns

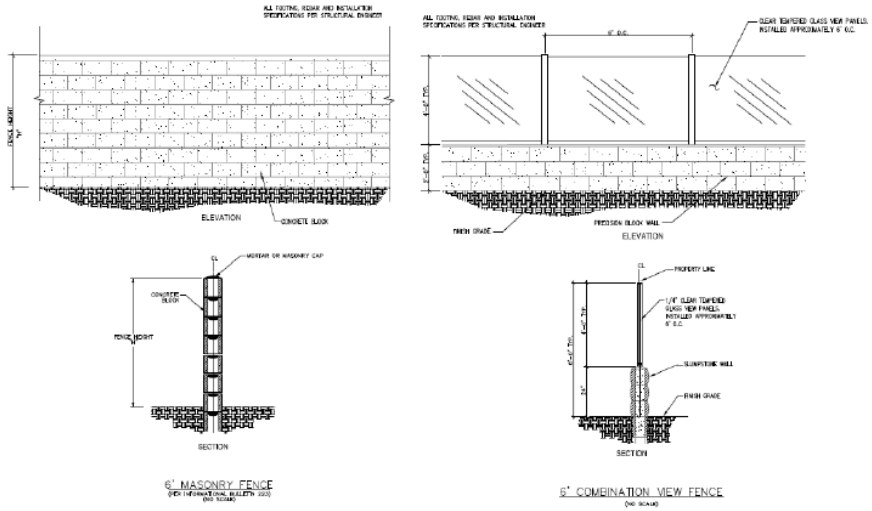


Side View Profile Showing Typical Influence of Proposed Flame-Heat Deflection Walls on Up-slope Wind and Fire Behavior on a Slope Condition



CMU Block Walls Used as Fire Barrier for Residential Sub-Division
(NOTE – Extreme Mitigation Configuration)





Finding: *The Department of Homeland Security, on its Lessons Learned Information Sharing web site has published a case study in which fire resistive block walls contributed to the successful defense of a home in the 2007 Witch Fire.*

Discussion:

The home was in the Ramona area in eastern San Diego County. The building was a ranch-style single family dwelling with adobe brick walls, a tiled roof, and fire resistive exterior doors and windows. A four foot (4') high adobe wall, approximately thirty (30') from the structure, served as a "fire break".

The Witch Fire burned through the neighborhood on October 21, 2007.

Witnesses stated that the flame front and its residual burning in the area lasted for approximately two hours. The structure did not have enclosed eaves and some of the defensible space vegetation and trees were not code compliant. The homeowner found cinders on windowsills, evidence that the fire resistive dual pane windows prevented the fire from entering the structure. A neighboring building, without benefit of a fire resistive block wall, and built with similar construction methods, burned to the ground.

Fire behavior in the Ramona area is influenced by similar adverse weather, climate, fuel and burning conditions as found on the Project Site.

Finding: *NFPA 1144 recommends the use of non-combustible walls and barriers for deflecting radiant heat and windblown embers when defensible space has less than a thirty (30') foot width around exposed buildings. In this instance, non-combustible*

walls are permitted when hazardous conditions do not allow sufficient space between buildings and undisturbed native vegetation or slopes.

Finding: *San Diego County FAHJs have required or permitted the use of Heat/Flame Deflection CMU block walls as mitigation for unusual fire behavior conditions or Project site constraints that do not allow Code compliance with prescriptive defensible space Depth. These FAHJs include the City of San Diego, City of Encinitas, and San Miguel Fire Protection District.*

Finding: *The City of San Diego allows a six-foot tall CMU block Heat/Flame Deflection Wall within ten (10') feet of a building when defensible space Depth cannot be achieved (SDFD Fire Prevention Policy B-18-01).*

Finding: *Coffman Engineering analyzed the heat exposure and ignition threats to a UC San Diego Campus multi-story (4-floors) classroom building, with minimal brush field clearances, during an extreme Santa Ana wind fire event. This analysis, using scientific fire protection engineering calculations and fire modeling by the BEHAVE and FDS programs, indicates that the building, and its contents, would not be subjected to sufficient radiant heat energy threats leading to ignition when a six-foot tall heat/flame deflection wall installed 10 meters (33 feet) from the exterior walls of the building.*

Additional Discussion

1. *There are no inherent differences in size, exposure fire resistiveness or configuration in the physical construction of a CMU block wall used as a flame/heat deflection wall or for a site and soil retaining wall.*
2. *Placing CMU block retaining/heat-flame deflection wall adds a significant area of defensible space landmass between the building and the unmanaged off-site vegetative fuel beds.*
3. *The CMU flame-heat deflection wall will divert radiant and convective heat away from the exposed single family residential buildings.*
4. *With the option of installing fire-rated or tempered glass in the above ground/above grade portions of the CMU flame/heat deflection wall, future homeowners/residents will not lose viewing opportunities that would otherwise be hidden behind the concrete wall surfaces.*

Conclusion: *If required to provide additional performance-based mitigation for deficiencies in defensible space depth, flame-heat deflection walls effectively limit the spread of a fire across the landscape and divert heat energy sources away from exposed buildings, preventing ignition under multiple burning characteristic conditions.*

SECTION 6
CONCLUSIONS

6.1 Significant Impacts Mitigated by Fire Protection Plan Requirements

Due to the severity of impacts from the improper management of wild land areas, the existing laws are stringent and regulate all aspects of wild land fire including building standards, fuel modification, water availability/flow, and access.

San Diego County's weather, fuel, and terrain contribute to the development of intense, uncontrolled wildfires as evident by the recent Cedar, Paradise and Otay fires of October 2003 and the Witch, Harris, and Poomacha Fires of 2007.

The areas of greatest concern for the impact of wildfires on developments are projects immediately adjacent to, or intermixed with, undeveloped wild land areas or unmanaged vegetation stands in Open Space preserves.

As the population of San Diego County increases and the Wildland Urban Interface (WUI) expands, fire hazards and risks will continue to be encountered. Vehicle access to residential subdivisions next to WUI areas or Open Space easements and an increase in other human activities in these areas increases the risk of property loss, injury or death and contribute to the impact of potential wild land fires.

The proposed development of the subdivided parcel is for existing and future residential parcels. The Project proposes a four-lot land division on a 160-acre parcel that currently has one existing residential lot, surrounded by otherwise undeveloped lands covered with unmanaged native, naturalized, and invasive vegetation.

The existing undeveloped lands on the existing parcel could represent a potentially significant fire hazard to adjacent off-site properties. Unmanaged vegetation could create an unrestricted path of fire extension into other developed residential lands. These threats will continue until the mitigations proposed by this Fire Protection Plan are implemented with the development of the four parcels.

Development of, and improvements to, the Project lands will provide the project site and surrounding residential parcels with enhanced water supply resources.

6.1.1 Emergency Services

The project site is served by the San Diego County Fire Protection District. The District is an all-hazard fire protection agency that provides services year-round.

Finding: *The fire protection services provided by the District meet or exceed the requirements to reduce the Significant Impact of providing adequate emergency services.*

6.1.1.1 Fire Department Response Time

The project is zoned A-72 Agricultural property, and all the proposed lots are forty (40). acres, placing the parcels in the RL-40 Rural Land Use Category.

Maximum fire travel time for RL-40 Rural Land Use Designation for Single Family Dwellings is twenty (20) minutes.

Estimated Fire Department response time to the Project Site from San Diego FPD Station 24 is approximately five (5) minutes.

Table S-1 Travel Time Standards from the Closest Fire Station*

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	■ Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1) ■ Commercial and Industrial Designations in the Village Regional Category ■ Development located within a Village Boundary	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	■ Semi-Rural Residential Areas (> SR-1 and SR-2 and SR-4) ■ Commercial and Industrial Designations in the Semi-Rural Regional Category ■ Development located within a Rural Village Boundary	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	■ Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) ■ *All* Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low-density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.

***Finding**: Project documentation, agency recommendations and the FPP analysis have determined that the project meets or exceeds the requirements of Fire Department Response Time Significant Impacts*

6.1.2 Access and Evacuation

The primary and secondary roads providing emergency access and egress meet the minimum Fire Code length, width, paving and slope requirements between the project site and an intersection where two directions of egress travel are available.

There are no actual or potential bottlenecks or other constraints between the project site and the above referenced intersection. Private roads and driveways will be provided with sufficient width to allow simultaneous passage of civilian vehicles and fire apparatus.

Fire Apparatus Access Roads (Fire Lanes) established under the requirements of this Fire Protection Plan will be maintained in perpetuity.

The longest fire apparatus access road on the Project Site measures 2010 feet and is 3270 feet *shorter* than the maximum permitted length for parcel sizes of twenty (20) acres or more.

Finding: *When fire apparatus access road requirements are met on the Project Site, the Fire Protection Plan provisions for Access and Evacuation will meet or exceed the mitigations needed to diminish Significant Impacts in this category.*

6.1.3 – Water Supply

DETERMINATION: *No additional mitigations are recommended or required.*

6.1.4 – Ignition Resistant Construction

All new buildings and structures erected on the project site will be required to meet the County of San Diego Building Code Chapter 7-A requirements for Wildland Urban Interface Areas and Chapter 7-A requirements of the California Building Code.

These requirements mandate the installation of automatic fire sprinkler systems compliant with NFPA Pamphlet 13-D *Installation of Automatic Fire Sprinklers in One- and Two-Family Dwellings* standards.

Finding: *The building standards proposed by this Fire Protection Plan will provide a reasonable degree of ignition resistant buildings at the project site and reduce the Significant Impact caused by less resistive construction standards.*

6.1.5 Defensible Space and Fuel Modifications

Fire behavior modeling analysis for fuel modification zones around the existing and future proposed Project Site buildings indicates that a minimum 153 feet of defensible space provides a safe separation distance between buildings and unmanaged vegetation. One or more of the proposed parcels have constraints that limit defensible space widths and safe separation distances.

Researchers with the US Forest Service Forest Fire Laboratory had acknowledged that, in some cases, BEHAVE fire modeling program overpredicts some fire behavior characteristics and outputs when analyzing the landscape and corresponding fire behavior in the environment.

Review of Dr. Jack Cohen's Northwest Territory full-scale fire testing data indicates that the maximum 113-feet of defensible space provided on constrained parcels is sufficient to prevent ignition from radiant heat energy and direct flame contact. The National Fire Protection Association incorporates the data derived from these tests into its Structural Assessment of Ignition from Wildfire course curriculum and student manuals.

The depth of the proposed fuel modification zones, in synergy with the recommended alternative means and methods of performance-based design mitigations, will prevent ignition of the building from direct flame contact and radiant heat energy under normal weather conditions.

Finding: *When met, the Fire Protection Plan provisions for Fuel Modification Zones and Defensible Space will meet or exceed the reduction of Significant Impacts in this category.*

CONCLUSIONS:

This fire protection plan demonstrates compliance with the applicable regulations.

It will ensure adequate compliance with codes/regulations and significance standards, including required fuel modifications and construction resistive materials.

The Fire Protection Plan and its contents can be incorporated by reference into the project's Final Conditions of Approval and enforced through each proposed structure's Certificate of Occupancy Conditions.

DISCLAIMERS

The Fire Protection Plan is a third-party neutral assessment of the actual or potential fire and life safety conditions present at the Harbison Canyon TPM Project Site.

The Consultant is neither biased towards the perspective of the Fire Authority Having Jurisdiction, the project development Design Team or the property owner.

The Consultant is ethically bound and professionally mandated to report on becoming aware of any hazardous conditions that threaten the present or future safety, health, and welfare of the public and so advise my clients. If such knowledge of hazardous conditions is not properly acted upon, the Consultant is further bound to notify the appropriate public authority.

The Consultant must perform his professional duties in a manner that considers environmental consequences.

The Consultant shall be honest in presenting data, estimates, professional opinions, and conclusions.

The Consultant will act in a professional manner for each client and shall not disclose confidential information concerning the business affairs or technical processes of any present or former client without consent.

The Consultant cannot guarantee that the Fire Authority Having Jurisdiction, or the local Building Official Having Jurisdiction, will accept and approve the contents of this

Fire Protection Plan or accept and approve the proposed fire and life safety mitigations brought forward for their consideration.

SECTION 7
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SECTION 8
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Aids to Determining Fuel Models for Estimating Fire Behavior, Hal E. Anderson, United States Department of Agriculture Forest Service Intermountain Forest and Range Experiment Station General Technical Report INT-122, April 1982

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California Government Code, sections 51175 through 51189.

2022 California Fire Code, CCR Title 24 Part 9, including Local Amendments and Appendices

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APPENDIX A
COUNTY OF SAN DIEGO APPROVED PLANT LISTS

SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
TREES		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Ceratonia siliqua	Carob	C/I/D
Cerdidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya		C/I/D
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Gingko biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditisia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	I
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Parkinsonia aculeate	Mexican Palo Verde	
Pistacia	Chinese Pistache	
chinensis	Pistachio Nut	C/I/D

vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	I
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

SHRUBS		
Agave	Century Plant	D
americana	Century Plant	D
deserti	Shawis Century Plant	D
shawi**		
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Carissa grandiflora	Natal Plum	C/I
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis**		
diversifolia	Summer Holly	C
Convolvulus cneorum	Bush Morning Glory	C/I/M
Dalea		
orcuttii	Orcutt's Delea	D
spinosa**	Smoke Tree	I/D
Elaeagnus		
pungens	Silverberry	C/I/M
Encelia**		
californica	Coast Sunflower	C/I
farinose	White Brittlebush	D/I
Eriobotrya		
deflexa	Bronze Loquat	C/I
Eriophyllum		
confertiflorum**	Golden Yarrow	C/I
staechadifolium	Lizard Tail	C
Escallonia spp.	Escallonia	C/I
Feijoa sellowiana	Pineapple Guava	C/I/D
Fouqueria splendens	Ocotillo	D
Fremontodendron**		
californicum	Flannelbush	I/M
mexicanum	Southern Flannelbush	I
Galvezia		
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	C
Garrya		
elliptica	Coast Silktassel	C/I
flavescens**	Ashy Silktassel	I/M

Salvia spp.**	California Wild Rose	C/I
Sambucus spp.**	Baja California Wild Rose	C/I
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I
Teucrium fruticans	Lilac	M
Toxicodendron**	Cape Honeysuckle	C/I/D
diversilobum	Bush Germander	C/I
Verbena		
lilacina	Poison Oak	I/M
Xylosma congestum		
Yucca**	Lilac Verbena	C
schidigera	Shiny Xylosma	C/I
whipplei		
	Mojave Yucca	D
	Foothill Yucca	I

VINES		
Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

PERENNIALS		
Coreopsis		
gigantean	Giant Coreopsis	C
grandiflora	Coreopsis	All Zones
maritime	Sea Dahlia	C
verticillata	Coreopsis	C/I
Heuchera maxima	Island Coral Bells	C/I
Iris douglasiana**	Douglas Iris	C/M
Iva hayesiana**	Poverty Weed	C/I
Kniphofia uvaria	Red-Hot Poker	C/M
Lavandula spp.	Lavender	All Zones
Limonium californicum		
var. mexicanum	Coastal Statice	C
perezii	Sea Lavender	C/I
Oenothera spp.	Primrose	C/I/M
Penstemon spp.**	Penstemon	C/I/D
Satureja douglasii	Yerba Buena	C/I
Sisyrinchium		
bellum	Blue-Eyed Grass	C/I
californicum	Golden-Eyed Grass	C
Solanum		
xantii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia	C/I
cana	Hoary California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

ANNUALS		
Lupinus spp.**	Lupine	C/I/M

UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

BOTANICAL NAME	COMMON NAME
Abies species	Fir Trees
Acacia species	Acacia (trees, shrubs, groundcovers)
*Adenostoma sparsifolium***	Red Shanks
*Adenostoma fasciculatum***	Chamise
Agonis juniperina	Juniper Myrtle
Araucaria species	Monkey Puzzle, Norfolk Island Pine
*Artemesia californica***	California Sagebrush
Bambusa species	Bamboo
Cedrus species	Cedar
Chamaecyparis species	False Cypress
Coprosma pumila	Prostrate Coprosma
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leylandii Cypress
*Cupressus forbesii***	Tecate Cypress
Cupressus glabra	Arizona Cypress
Cupressus sempervirens	Italian Cypress
Dodonea viscosa	Hopseed Bush
*Eriogonum fasciculatum***	Common Buckwheat
Eucalyptus species	Eucalyptus
*Heterotheca grandiflora***	Telegraph Plant
Juniperus species	Junipers
Larix species	Larch
Lonicera japonica	Japanese Honeysuckle
Miscanthus species	Eulalia Grass
*Muehlenbergia species***	Deer Grass
Palmae species	Palms
Picea species	Spruce Trees
*Pickeringia Montana***	Chaparral Pea
Pinus species	Pines
Podocarpus species	Fern Pine
Pseudotsuga menziesii	Douglas Fir
Rosmarinus species	Rosemary
*Salvia mellifera***	Black Sage
Taxodium species	Cypress
Taxus species	Yew
Thuja species	Arborvitae
Tsuga species	Hemlock
*Urtica urens***	Burning Nettle

APPENDIX B
ACCESS ROAD REQUIREMENTS

Primary roadways serving this Project shall have a minimum twenty-four (24) feet improved paved width. Private driveways shall have a minimum improved paved width of sixteen (16') feet**.**

All roads and driveways shall not exceed 20% grades. Any road or driveway between 15 and 20 percent will be a concrete surface and have a deep broom finish perpendicular to the direction of travel to enhance traction.

All dead-end roads (including driveways) more than 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

All roads within the development shall be all-weather paved streets capable of supporting fire apparatus weighing up to 75,000 pounds.

All roads shall be provided with the approved paved driving surface prior to construction and/or bringing combustible building products onto each parcel.

Gates Across Roads -

- Gates shall be automatic.
- Gates shall be equipped with approved emergency key-operated switches that override all gate command functions and open the gate(s).
- Gates shall also be equipped with approved emergency tract control-activating strobe light sensor(s) or other devices approved by the San Diego County FPD Chief, which will activate the gate on the approach of emergency apparatus.
- Gate opening mechanisms shall be provided with battery back-up or manual mechanical disconnects in the event of power failures.
- Gates shall conform to San Diego County FPD requirements and County design requirements DS-17, 18, and 19.

Typically, roads having improved paved width less than thirty-six (36') feet shall be designated Fire Apparatus Access Roads (Fire Lanes). Fire Lanes shall be identified by:

- Red curbs with white stenciled letters plainly visible from a vehicle
- White stenciled letters on red curbs shall state "Fire Lane-No Parking" Fire Lane signs posted in compliance with Section 22500.1 of the California Vehicle Code

APPENDIX C
IGNITION RESISTANT CONSTRUCTION & FIRE PROTECTION SYSTEMS

Several pre-cautionary ignition-resistant construction measures will be used to reduce potential ignition of residences from wild land fires firebrands.

All structures shall be built with Class A Roof Assemblies, including a Class A roof covering.

The exterior wall surface materials shall be non-combustible, or an approved alternate, and shall be protected by two inch nominal solid blocking between rafters all roof overhangs or by stucco boxed-in eaves.

Attic or foundation ventilation louvers or ventilation openings shall not exceed 144 square inches per opening and shall be covered with 1/4-inch mesh corrosion-resistant metal screening or other approved material that offers equivalent protection. Attic ventilation shall also comply with the requirements of the California Building Code (C.B.C.). Attic ventilation openings or ventilation louvers in soffits, eave overhangs, between rafters at eaves, or in other overhanging areas shall not be permitted.

Paper-faced insulation shall be prohibited in attics or ventilated spaces.

All chimney, flue or stovepipe openings will have an approved spark arrester. Spark arrestors shall be installed to be visible for the purposes of inspection and maintenance.

Glass or other transparent, translucent, or opaque glazing, including skylights, shall be constructed of tempered glass or multi-layered panels with at least one tempered pane or glass block construction. Exterior glazing shall have a minimum fire-resistance rating of not less than 20 minutes.

All residential structures will have automatic interior fire sprinklers installed according to the National Fire Protection Association (NFPA) 13D-*Standard for the Installation of Automatic Fire Sprinklers in One- and Two-family Homes and Manufactured Homes* and San Diego County Fire Protection District standards.

Rain gutters, down spouts and gutter hardware will be constructed from metal or other approved non-combustible material. Gutters will be designed to reduce the accumulation of leaf litter and debris.

The first five feet of fences and other construction (gates, gate posts, fence posts) attached to structures shall be of non-combustible material.

All projections (patio covers, unenclosed roofs and floors, and similar architectural appendages and projections) will be of non-combustible construction, one-hour fire

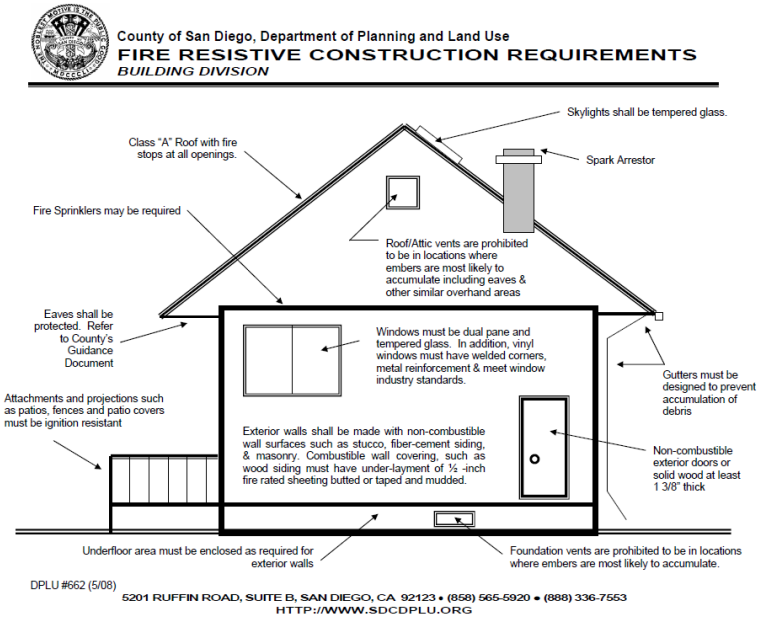
resistive construction on the underside, or heavy timber construction. When such appendages and projections are attached to exterior fire-resistive walls, they will be constructed to maintain the fire-resistive integrity of the wall.

Exterior balconies and decks will be of non-combustible construction, one-hour fire resistive construction on the underside, or heavy timber construction. Exterior decks shall be completely enclosed from the bottom of the deck surface to ground level and covered with approved non-combustible construction materials.

Exterior doors will be approved non-combustible construction, solid core wood not less than 1-3/8 inches thick (or equivalent) and have a fire resistive rating of not less than 20 minutes.

All windows will be provided with 1/8 inch metal mesh or similar non-combustible screens to prevent embers from entering the structure during high wind conditions.

Any damaged or replacement window, siding, roof coverings, and other mitigation measures will meet or exceed the original intent of the fire protection discussed in this Plan.



APPENDIX D
DEFENSIBLE SPACE AND VEGETATION

D.1 Additional Zone 1 Fuel Modification Requirements

All undesirable non-native vegetation (***See APPENDIX A***) will be removed and replanted with drought tolerant, fire-resistant landscaping.

Vegetation may include single or cluster of trimmed fire resistant native and ornamental plants (oaks, sumac, toyon, ***SEE APPENDIX A.***)

Dense plant masses adjacent to the structures and at bases of trees and tree clusters will not be placed in this Zone. Provide low growing, fire resistive, deep rooted, drought tolerant planting to maintain erosion control and soil stability, especially on manufactured slopes.

Native or ornamental trees to be retained within fuel modification zones shall be pruned to maintain a vertical separation of approximately ten (10) feet above underlying shrubs or groundcover. Pruning of the shrubs will minimize the impact of the tree pruning.

Trees and large shrubs over 15 feet in height (oaks, sumac, toyon, etc.) shall be pruned to provide clearance between plants of three (3) times the height of understory plants, or 10 feet, whichever is greater.

Trees may be planted and maintained as individual specimens or clustered with no more than three (3) trees in a single cluster with a minimum distance between mature canopies of 20 feet. Avoid planting trees directly uphill of one another.

Tree canopies will not be allowed to overhang the roof of any structure; the outer edge of the canopies of mature trees will be a minimum of ten (10) feet from the building eaves, and free of all dead or dying parts.

All the dead material must be pruned out of all vegetation on an annual and as- needed basis by June 1st of each year.

The mature heights of new shrub plantings will be a maximum of 36 inches.

Zone 1 Defensible Space is an irrigated landscaping zone. This zone may be irrigated with micro-irrigation when overhead irrigation may cause erosion.

Firewood and combustible material shall not be stored within thirty (30') of buildings and structures, under unenclosed spaces beneath buildings or structures, or on decks or under eaves, canopies or other projections or overhangs.

Highly flammable plant species will be permanently removed from Zone 1 Defensible Space because of their susceptibility to wild land fire. Additionally, certain ornamental plants shall not be planted or allowed to become established within Zone 1 Defensible Space unless otherwise specified as acceptable in the Recommended Plant List in Appendix A or as approved by the Fire Marshal.

D.2 Additional Zone 2 Fuel Modification Requirements

If shrubs are located underneath a tree's drip line, the lowest branch shall be at least three times as high as the understory shrubs or 10 feet, whichever is greater.

Large continuous masses of shrubs and understory less than 15 feet in height will be thinned to remove fuel and provide at least ten (10) feet between shrub masses, or individual shrubs. Thinning will reduce the overall canopy coverage of the area by a minimum of fifty (50) percent.

Mulches, chips, and other small multi-cuttings (cut to less than two inches in diameter and four inches in length) will only be evenly spread over the area no more than 6 inches at least 50 feet from structures. This can be used to prevent grass and weed encroachments within the treated areas. Mulching helps to maintain soil moisture for designated plants, reduces the growth of annual grasses, and minimizes soil erosion.

There is a high probability that the openings will be dominated by non-native weed or grass species. Therefore, all grasses and weeds are to be mowed or weed-whipped to a four (4) inch stubble height by June 1st of each year or when the fuels become cured, whichever occurs first. Any vegetation biomass (debris and trimmings) produced by thinning and pruning shall be removed from the site or converted to mulch by chipping and evenly distributed to a maximum depth of four (4) inches and at kept at least 50 feet from a structure.

D.3 Additional General Fuel Modification Measures

Brush removal shall be completed prior to commencing any flammable construction.

During construction at least 50 feet of clearance around the structures shall be free of all flammable vegetation as an interim fuel modification zone.

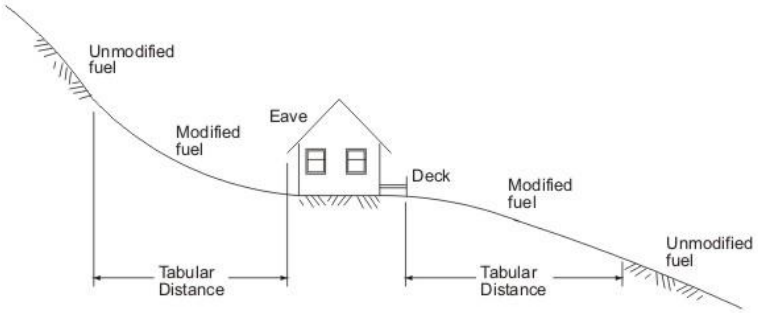
The annual completion of all designated Fuel Modification Treatments will occur prior to June 15th.

All individual landscaping plans, including additional structures, will comply with the Fire Protection Plan.

Trees and plants will be planted in accordance with the County of San Diego Approved

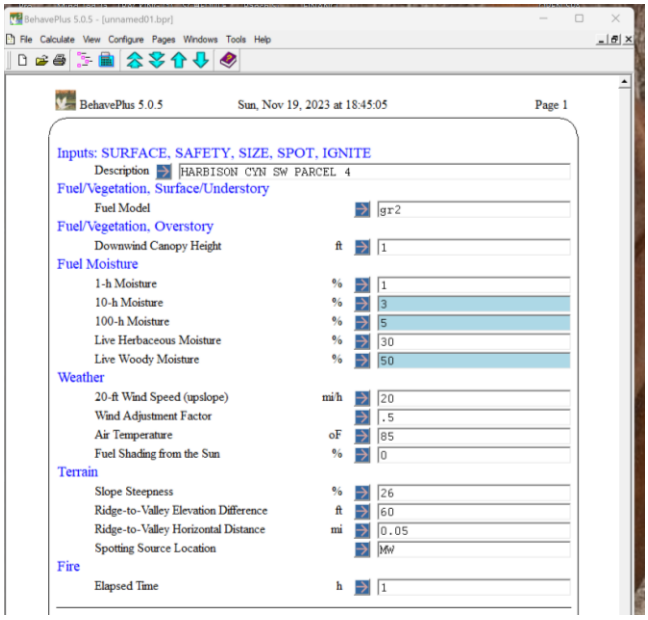
Plants for Defensible Space in Fire Prone Areas List or as approved by the San Diego County Fire Protection District.

Any disputes of yard landscaping regarding the interpretation of this Fire Protection Plan (FPP) will be decided by the San Diego County Fire Marshal. The Fire Marshal's decision will be final and binding on the landowner.



Example of Fuel Modification Zone configuration for 100' depth between structure and unmodified fuel – "tabular distance" is the required lateral distance, without regard to distances produced by slope inclination or declination, from the edge of buildings to the unmanaged vegetative fuel bed.

APPENDIX E
BEHAVE FIRE MODELING OUTPUTS



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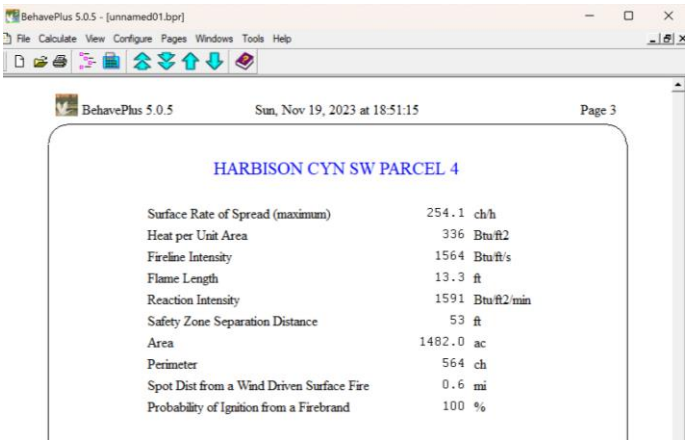
BehavePlus 5.0.5 Sun, Nov 19, 2023 at 18:45:05 Page 1

Inputs: SURFACE, SAFETY, SIZE, SPOT, IGNITE

Description		HARBISON CYN SW PARCEL 4
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr2
Fuel/Vegetation, Overstory		
Downwind Canopy Height	ft	1
Fuel Moisture		
1-h Moisture	%	1
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
20-ft Wind Speed (upslope)	mi/h	20
Wind Adjustment Factor		.5
Air Temperature	oF	85
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	26
Ridge-to-Valley Elevation Difference	ft	60
Ridge-to-Valley Horizontal Distance	mi	0.05
Spotting Source Location		MW
Fire		
Elapsed Time	h	1



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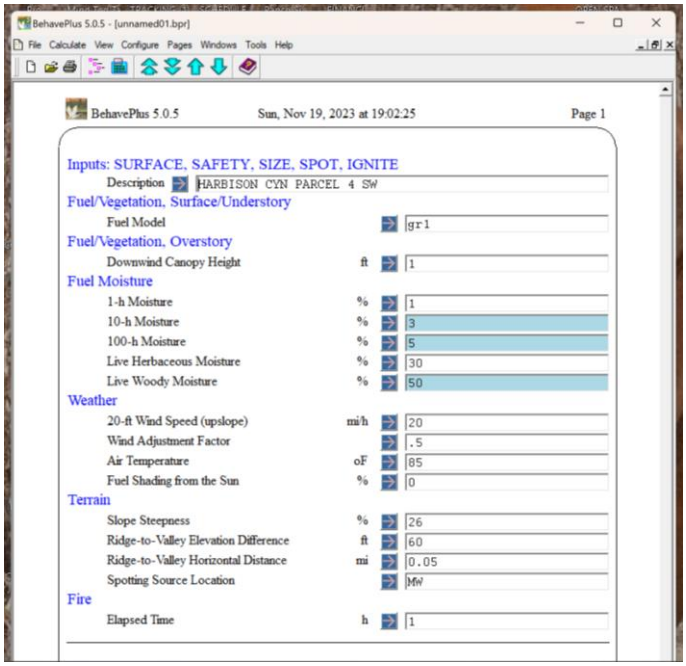
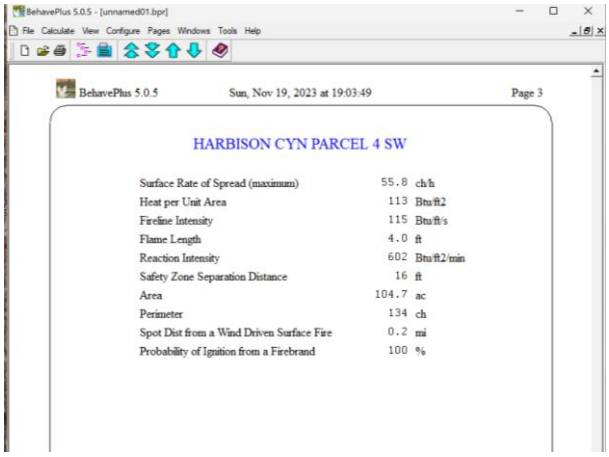
HARBISON CYN SW PARCEL 4

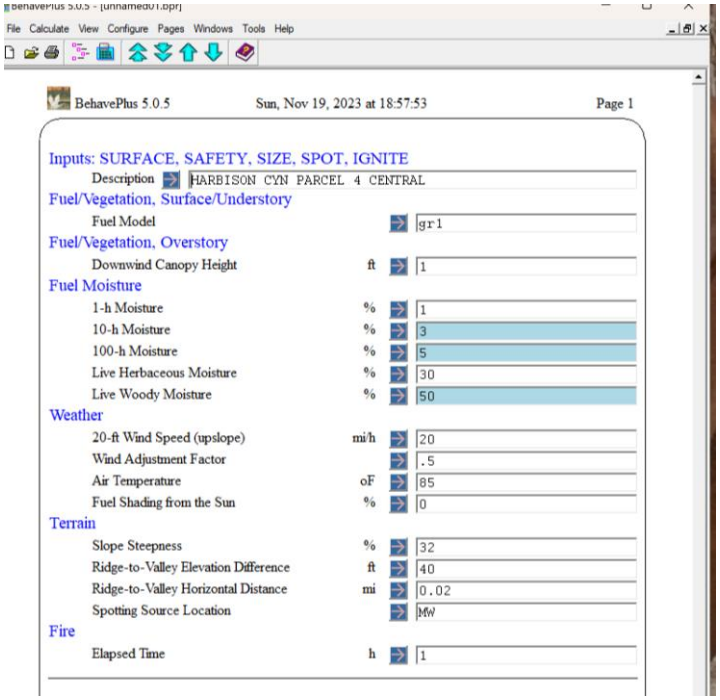
Surface Rate of Spread (maximum)	254.1	ch/h
Heat per Unit Area	336	Btu/ft2
Fireline Intensity	1564	Btu/ft/s
Flame Length	13.3	ft
Reaction Intensity	1591	Btu/ft2/min
Safety Zone Separation Distance	53	ft
Area	1482.0	ac
Perimeter	564	ch
Spot Dist from a Wind Driven Surface Fire	0.6	mi
Probability of Ignition from a Firebrand	100	%

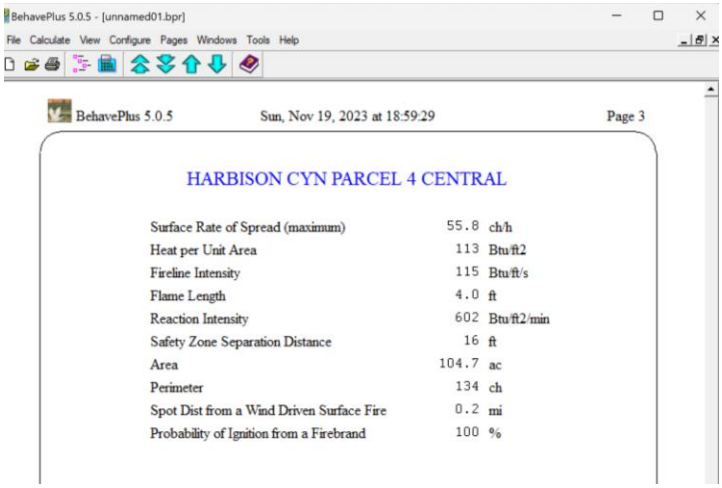
BEHAVE FIRE MODELING – SANTA ANA WIND EVENT – PARCEL 4 SOUTHWEST CORNER – ROADSIDE START FM GR-2





BEHAVE FIRE MODELING – SANTA ANA WIND EVENT – PARCEL 4 SOUTHWEST CORNER – ROADSIDE START FM GR-1





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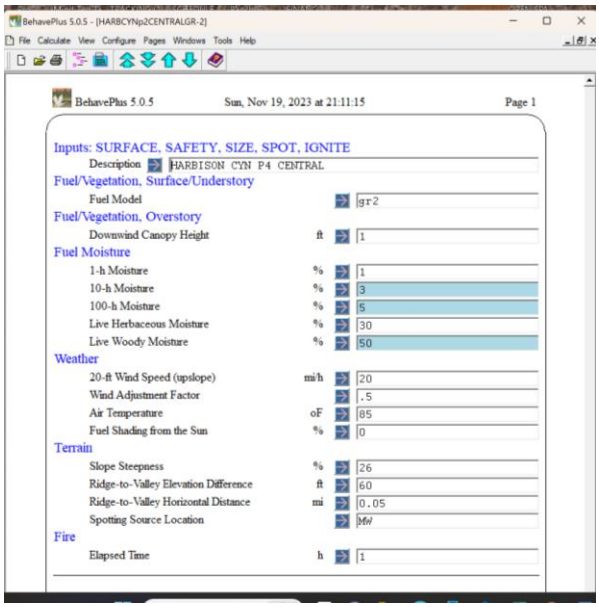
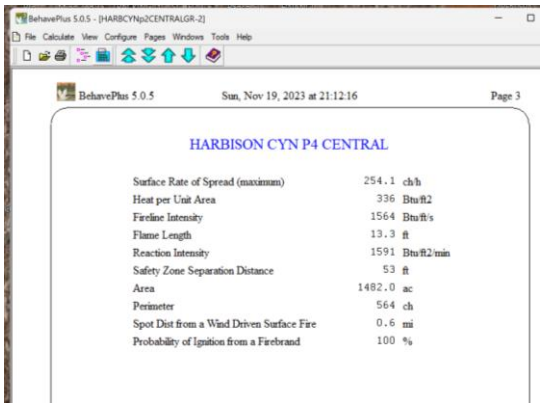
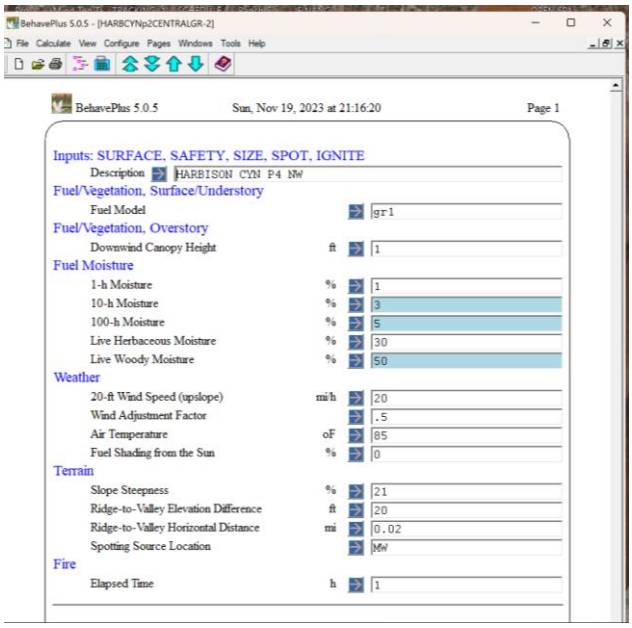
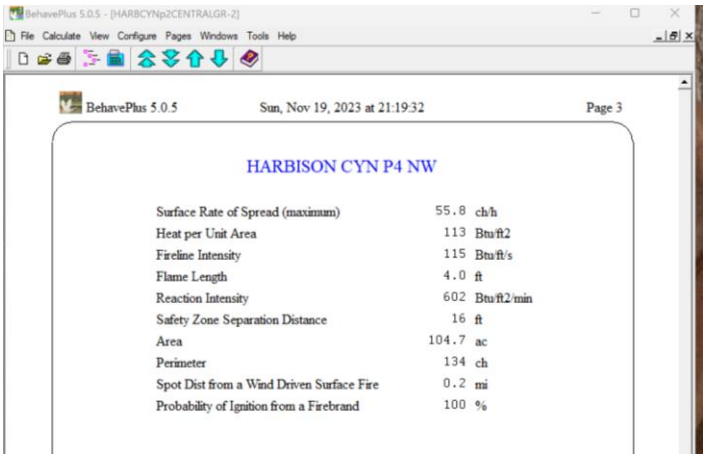




BEHAVE FIRE MODELING – SANTA AND WIND EVENT –

PARCEL 4 CENTRAL AREA FM GR-2





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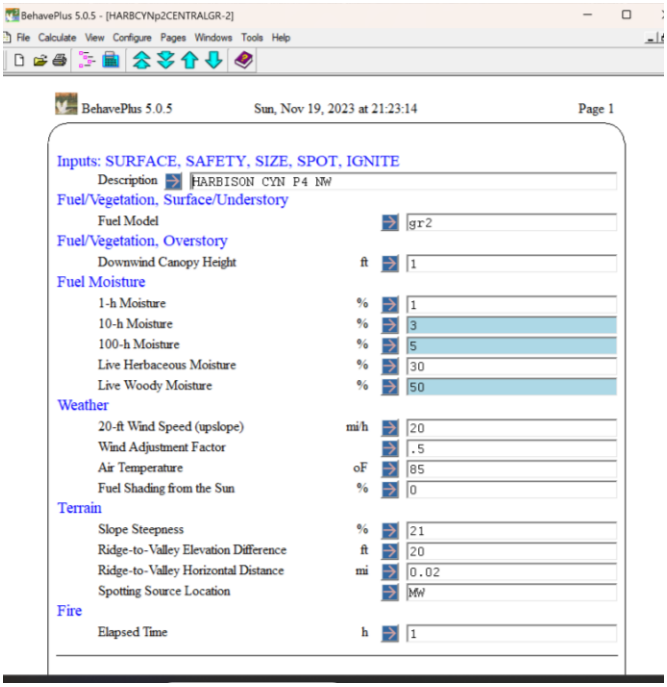

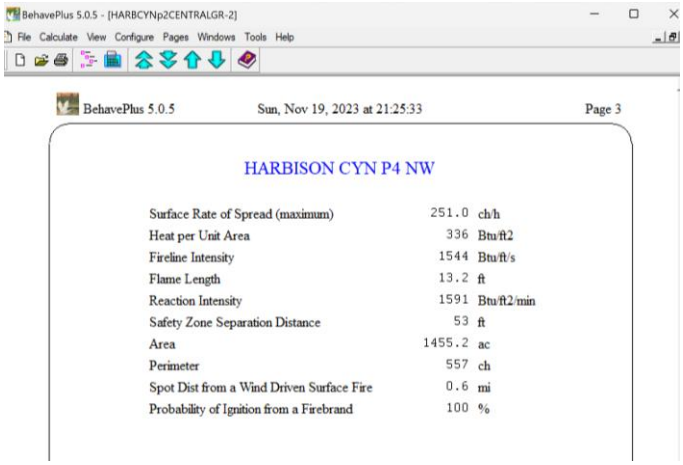

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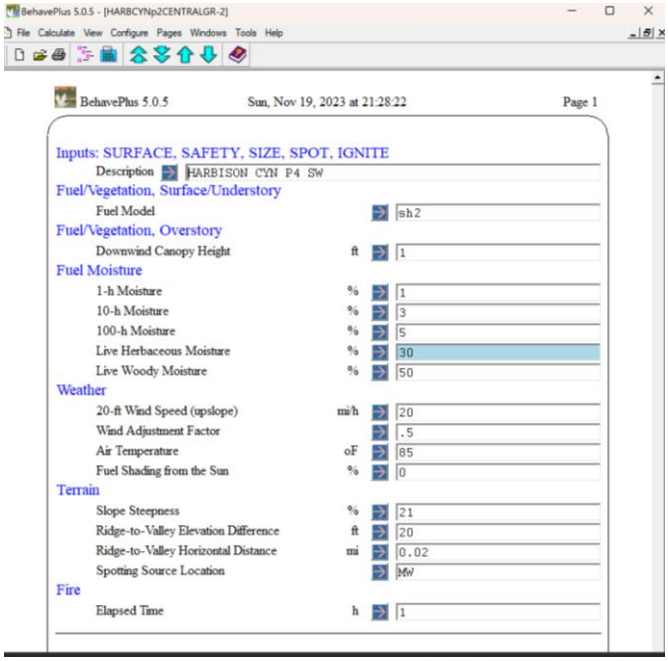
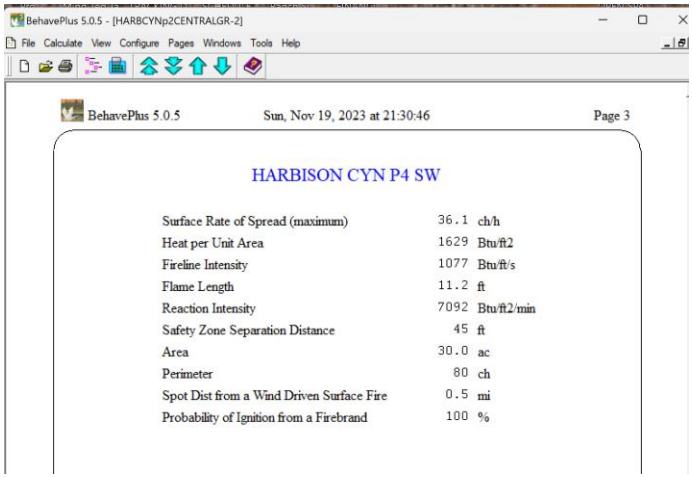
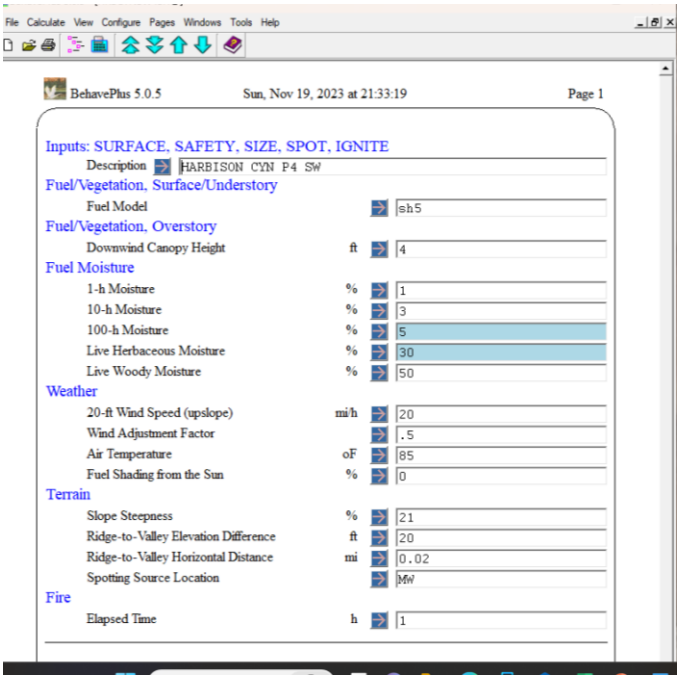




BEHAVE FIRE MODELING – SANTA AND WIND EVENT – PARCEL 4 SW FM SH-2



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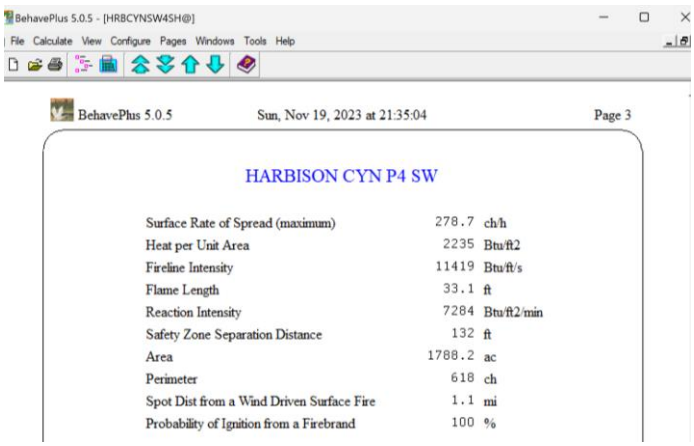
Inputs: SURFACE, SAFETY, SIZE, SPOT, IGNITE

Description		HARBISON CYN P4 SW
Fuel/Vegetation, Surface/Understory		
Fuel Model		sh5
Fuel/Vegetation, Overstory		
Downwind Canopy Height	ft	4
Fuel Moisture		
1-h Moisture	%	1
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
20-ft Wind Speed (upslope)	mi/h	20
Wind Adjustment Factor		.5
Air Temperature	oF	85
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	21
Ridge-to-Valley Elevation Difference	ft	20
Ridge-to-Valley Horizontal Distance	mi	0.02
Spotting Source Location		MW
Fire		
Elapsed Time	h	1



BehavePlus 5.0.5 - [HRBCYNSW4SH@]

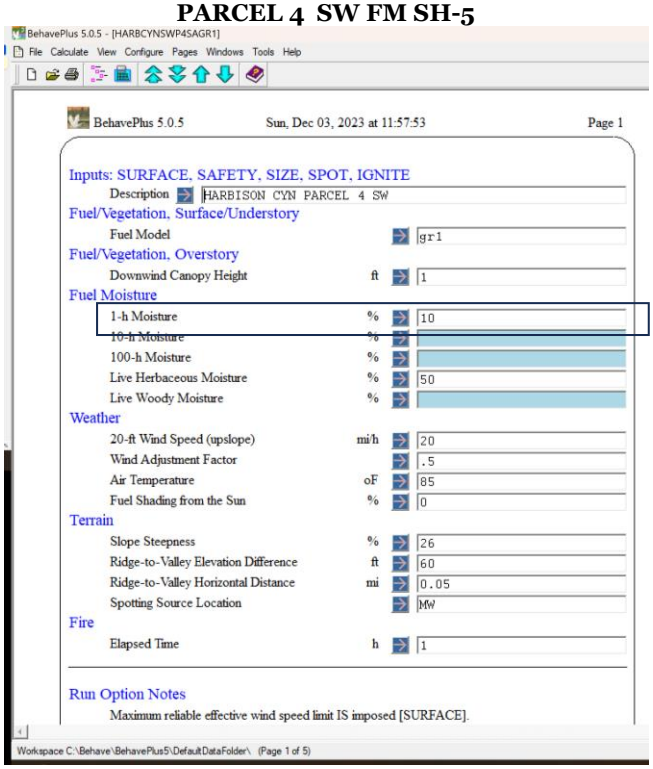
File Calculate View Configure Pages Windows Tools Help

BehavePlus 5.0.5 Sun, Nov 19, 2023 at 21:35:04 Page 3

HARBISON CYN P4 SW

Surface Rate of Spread (maximum)	278.7	ch/h
Heat per Unit Area	2235	Btu/ft2
Fireline Intensity	11419	Btu/ft/s
Flame Length	33.1	ft
Reaction Intensity	7284	Btu/ft2/min
Safety Zone Separation Distance	132	ft
Area	1788.2	ac
Perimeter	618	ch
Spot Dist from a Wind Driven Surface Fire	1.1	mi
Probability of Ignition from a Firebrand	100	%

BEHAVE FIRE MODELING – SANTA AND WIND EVENT – PARCEL 4 SW FM SH-5



BehavePlus 5.0.5 - [HARBCYNSWP4SAGR1]

File Calculate View Configure Pages Windows Tools Help

BehavePlus 5.0.5 Sun, Dec 03, 2023 at 11:57:53 Page 1

Inputs: SURFACE, SAFETY, SIZE, SPOT, IGNITE

Description		HARBISON CYN PARCEL 4 SW
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr1
Fuel/Vegetation, Overstory		
Downwind Canopy Height	ft	1
Fuel Moisture		
1-h Moisture	%	10
10-h Moisture	%	
100-h Moisture	%	
Live Herbaceous Moisture	%	50
Live Woody Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	20
Wind Adjustment Factor		.5
Air Temperature	oF	85
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	26
Ridge-to-Valley Elevation Difference	ft	60
Ridge-to-Valley Horizontal Distance	mi	0.05
Spotting Source Location		MW
Fire		
Elapsed Time	h	1

Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

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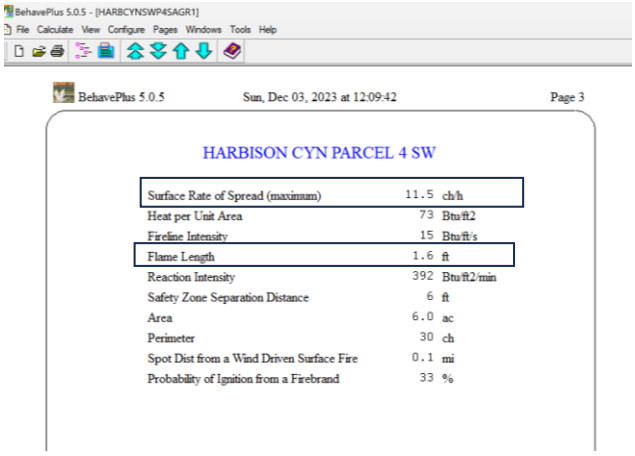

BehavePlus 5.0.5 - [HARBCYNSWP4SAGR1]

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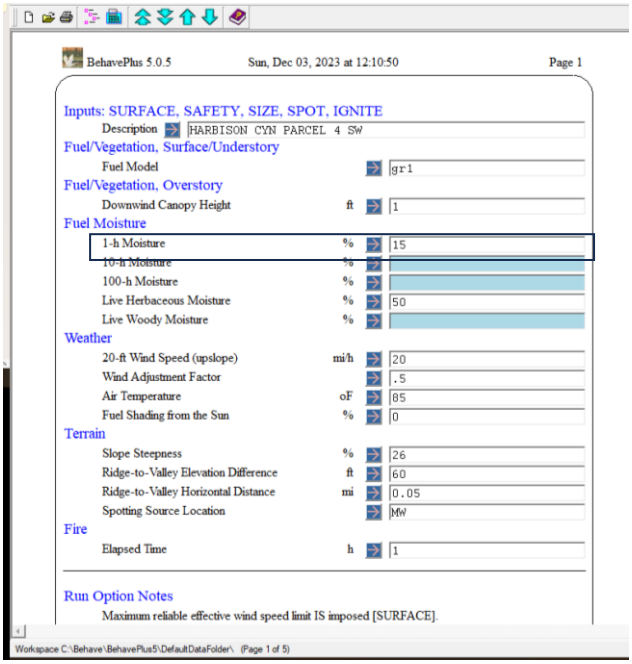
BehavePlus 5.0.5 Sun, Dec 03, 2023 at 12:09:42 Page 3

HARBISON CYN PARCEL 4 SW

Surface Rate of Spread (maximum)	11.5	ch/h
Heat per Unit Area	73	Btu/ft2
Fireline Intensity	15	Btu/ft/s
Flame Length	1.6	ft
Reaction Intensity	392	Btu/ft2/min
Safety Zone Separation Distance	6	ft
Area	6.0	ac
Perimeter	30	ch
Spot Dist from a Wind Driven Surface Fire	0.1	mi
Probability of Ignition from a Firebrand	33	%

BEHAVE FIRE MODELING – FUEL MODEL GR-1, 10% FM



BehavePlus 5.0.5 Sun, Dec 03, 2023 at 12:10:50 Page 1

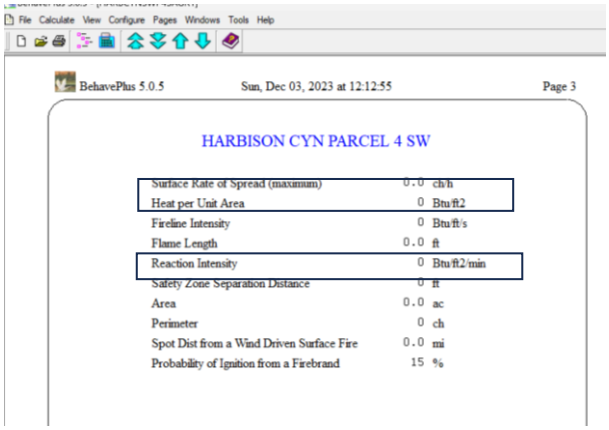
Inputs: SURFACE, SAFETY, SIZE, SPOT, IGNITE

Description		HARBISON CYN PARCEL 4 SW
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr1
Fuel/Vegetation, Overstory		
Downwind Canopy Height	ft	1
Fuel Moisture		
1-h Moisture	%	15
10-h Moisture	%	
100-h Moisture	%	
Live Herbaceous Moisture	%	50
Live Woody Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	20
Wind Adjustment Factor		.5
Air Temperature	oF	85
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	26
Ridge-to-Valley Elevation Difference	ft	60
Ridge-to-Valley Horizontal Distance	mi	0.05
Spotting Source Location		MW
Fire		
Elapsed Time	h	1

Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Workspace C:\Behave\BehavePlus5\DefaultDataFolder\ (Page 1 of 5)



File Calculate View Configure Pages Windows Tools Help

BehavePlus 5.0.5 Sun, Dec 03, 2023 at 12:12:55 Page 3

HARBISON CYN PARCEL 4 SW

Surface Rate of Spread (maximum)	0.0	ch/h
Heat per Unit Area	0	Btu/ft2
Fireline Intensity	0	Btu/ft/s
Flame Length	0.0	ft
Reaction Intensity	0	Btu/ft2/min
Safety Zone Separation Distance	0	ft
Area	0.0	ac
Perimeter	0	ch
Spot Dist from a Wind Driven Surface Fire	0.0	mi
Probability of Ignition from a Firebrand	15	%

BEHAVE FIRE MODELING – FUEL MODEL GR-1, 15% FM

APPENDIX F
PROJECT FACILITY AVAILABILITY FORM 399F

County of San Diego, Planning & Development Services
PROJECT FACILITY AVAILABILITY - FIRE
ZONING DIVISION

Please type or use pen

Nagham Sabah — Owner's Name — 224-425-8802 — Phone
1233 Pfeifer Lane — Owner's Mailing Address — Street
El Cajon — City — CA — State — 92020 — Zip

ORG_____ **F**
ACCT_____
ACT_____
TASK_____
DATE_____ AMT $_____
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — **TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☒ Minor Subdivision (TPM) ☐ Certificate of Compliance:_____
☐ Boundary Adjustment
☐ Rezone (Reclassification) from_____to_____zone.
☐ Major Use Permit (MUP), purpose:_____
☐ Time Extension...Case No._____
☐ Expired Map...Case No._____
☐ Other_____

B. ☒ Residential ..... Total number of dwelling units 5
☐ Commercial ..... Gross floor area_____
☐ Industrial ..... Gross floor area_____
☐ Other ..... Gross floor area_____

C. Total Project acreage 12.3 Total lots 5 Smallest proposed lot 1 ac

Assessor's Parcel Number(s) (Add extra if necessary)

513-101-11	

Thomas Guide. Page 1253 Grid B5
2030 Harbison Canyon — Project address — El Cajon, CA 92019 — Street
Crest / Dehesa / Granite Hills / Harbison Canyon — Community Planning Area/Subregion — 92019 — Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: Nagham Sabah Date: 8/23/2022
Address: 1233 Pfeifer Lane, El Cajon, CA 92020 Phone: 224-425-8802
(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

SECTION 2: FACILITY AVAILABILITY — **TO BE COMPLETED BY DISTRICT**

District Name: San Diego County Fire Protection District
Indicate the location and distance of the primary fire station that will serve the proposed project: Station 24, 551 Harbison Canyon Road 2.2 miles

A. ☒ Project is in the District and eligible for service.
☐ Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the District and not within its Sphere of Influence boundary.
☐ Project is not located entirely within the District and a potential boundary issue exists with the _____ District.

B. ☒ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is 4.39 minutes.
☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. ☐ District conditions are attached. Number of sheets attached:_____
☒ District will submit conditions at a later date.

SECTION 3. FUELBREAK REQUIREMENTS

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by Planning & Development Services.

☒ Within the proposed project 100 feet of clearing will be required around all structures.
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

David Sibbet — Authorized Signature — DAVID SIBBET, DEPUTY FIRE MARSHAL — Print Name and Title — 619-672-7112 — Phone — 8/23/22 — Date

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:
Planning & Development Services – Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123

PDS-399F (Rev. 2/26/2021)

APPENDIX G
PADRE DAM MUNICIPAL WATER DISTRICT FORM 399w

County of San Diego, Planning & Development Services
PROJECT FACILITY AVAILABILITY - WATER
ZONING DIVISION

Please type or use pen

Nagham Sabah — Owner's Name — 224-425-8802 — Phone
1233 Pfeifer Lane — Owner's Mailing Address — Street
El Cajon — City — CA — State — 92020 — Zip

ORG_____ ACCT_____ ACT_____ TASK_____ DATE_____ AMT $_____ **W**
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION — **TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance:_____
☐ Boundary Adjustment
☐ Rezone (Reclassification) from_____ to _____ zone.
☐ Major Use Permit (MUP), purpose:_____
☐ Time Extension...Case No._____
☐ Expired Map...Case No._____
☐ Other_____

B. ■ Residential . . . . . Total number of dwelling units 5
☐ Commercial. . . . . Gross floor area_____
☐ Industrial . . . . . Gross floor area_____
☐ Other . . . . . Gross floor area_____

C. ■ Total Project acreage 12.3 Total number of lots 5

D. Is the project proposing the use of groundwater? ☐ Yes ■ No
Is the project proposing the use of reclaimed water? ☐ Yes ■ No

Assessor's Parcel Number(s) (Add extra if necessary)

513-101-11	

Thomas Guide Page 1253 Grid B5
2030 Harbison Canyon — Project address — El Cajon, CA 92019 — Street
Crest / Dehesa / Granite Hills / Harbison Canyon — Community Planning Area/Subregion — 92019 — Zip

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project and COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [signature] Date: 8/23/2022
Address: 1233 Pfeifer Lane, El Cajon, CA 92020 Phone: 224-425-8802

(On completion of above, present to the district that provides water protection to complete Section 2 below.)

SECTION 2: FACILITY AVAILABILITY — **TO BE COMPLETED BY DISTRICT**

District Name: PADRE DAM MWD EXP. 8/31/2023 Service area WEST

A. ☑ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the _____ District.

B. ☐ Facilities to serve the project ☑ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached_____. (Number of sheets)
☐ Project will not be served for the following reason(s):_____

C. ☑ **District conditions are attached. Number of sheets attached:** 1
☐ **District has specific water reclamation conditions which are attached. Number of sheets attached:**_____
☐ **District will submit conditions at a later date.**

D. ☐ **How far will the pipeline(s) have to be extended to serve the project?**_____

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature: [signature] Print Name TOM MARTIN
Print Title ENG. TECH. / PROJECT MGR. Phone (619) 258-4638 Date 8/30/2022

NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT
On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:
Planning & Development Services – Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123

PDS-399W (Rev. 2/26/2021)

PADRE DAM
Municipal Water District

9300 Fanita Parkway, Santee
619-258-4635

WATER AVAILABILITY ATTACHMENT
CONDITIONS OF APPROVAL

PROJECT NAME Harbison Canyon Rd FOR 4 Lot Split SFR MAP NUMBER TPM

A.P.N.(s) 513-101-11-00

FACILITIES

Domestic/Irrigation service and fire hydrant requirements may determine if the proposed project will require a water main extension. If a water main extension is necessary, the following will be requirements to proceed with the project. The Developer / Property Owner shall:

[X] Prepare plans for a Potable Water system according to Padre Dam's Requirements.

[X] Provide the agreement and securities required by the County / City and/or Padre Dam to install the public water system required for the project.

[X] Install a Potable Water System per the Padre Dam Rules and Regulations and Standard Specifications.

[X] Pay for all installation and capacity fees for each meter connection, each lot, or each building. (As determined by project need prior to District providing service or an unconditional commitment letter)

[X] Install private/public potable water, reclaimed water and sewer lines with the required separation as determined by the Health Department and Padre Dam.

Padre Dam does not require that all lots be connected to the public water system. Alternate sources of water are under the jurisdiction of the County of San Diego, or the City of Santee.

EASEMENTS

[X] Developer shall dedicate to Padre Dam all necessary easements for that portion of the water system which is to be public.

[X] Easements shall meet minimum width requirements as shown in the Districts Rules and Regulations.

[X] Easements may be required by Padre Dam to allow for future main extensions to serve property beyond the boundaries of the map/project.

FACILITY COMMITMENT

[X] Adequate water facility commitment shall be committed prior to final project approval/map recordation and shall be available concurrent with project need. Unconditional Facility Commitment form will be signed upon payment of capacity and meter fees.

SPECIAL CONDITIONS

[X] Each legal lot requires its own service lateral connection and meter.

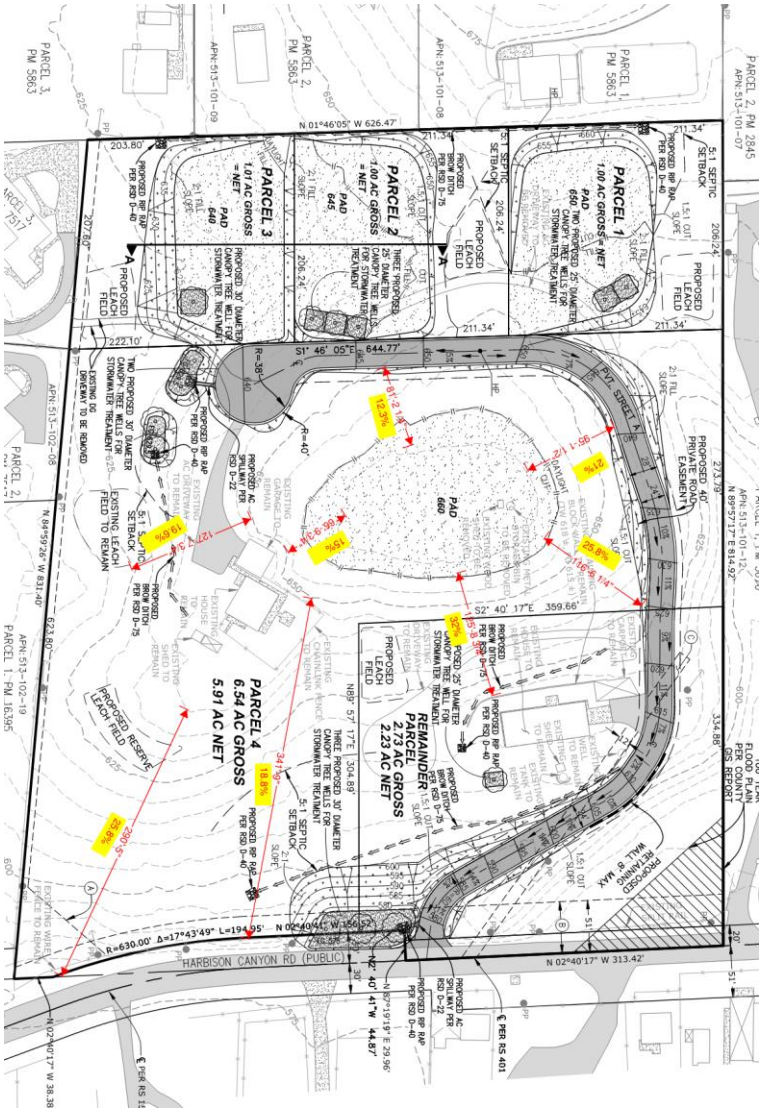
[X] There is an existing 16" PVC main on Harbison Canyon Rd. that may be used to serve the project.

[X] Water main looping is required.

[X] Any laterals not used as part of this project must be abandoned at the Developer's cost.

Approved by: Tom Martin Date: 08/30/2022
E-33 R- 8-/08

APPENDIX H
PROJECT SITE SLOPE ANALYSIS



APPENDIX I – FIRE HYDRANT LOCATIONS