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## **Section III: Fire Protection Plan Guidelines for Planning Team**

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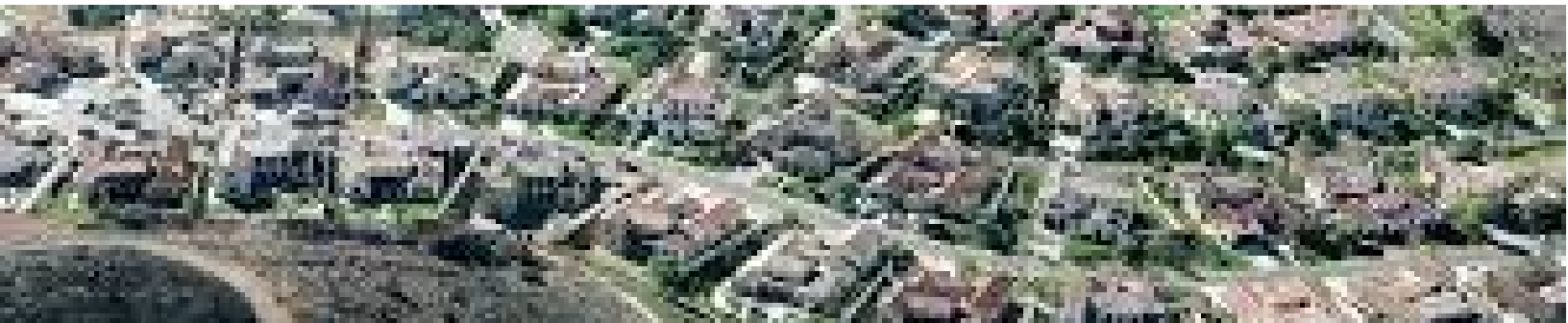


San Diego County- Fire Protection District /

County of San Diego- Land Use & Environmental Group, Planning & Development Services

***County of San Diego  
Fire Protection Plan Guidelines for Staff  
DRAFT 12/11/23***

**ROHDE**   
**& ASSOCIATES**  
WILDFIRE RISK MITIGATION



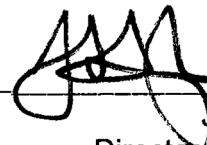
## APPROVAL

I hereby certify that these **Guidelines for Determining Significance and Report Format and Content Requirements for Wildland Fire and Fire Protection** are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and Technical Report Format and Content Requirements, were considered by the Director of Planning & Development Services, in coordination with the Director of Public Works, and approved by the County of San Diego Board of Supervisors on \_\_\_\_\_, .

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DAHVIA LYNCH-ERIC GIBSON

Director of Planning & Development



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Director  
Services and Land Use

I hereby certify that these Guidelines for Determining Significance and Report Format and Content Requirements for Wildland Fire and Fire Protection are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and Technical Report Format and Content Requirements and are hereby approved by the Deputy Chief Administrative Officer (DCAO) of the Land Use and Environment Group of August, 2010 \_\_. ~~The Director of Planning and Land Use is authorized to approve revisions to these Guidelines for Determining Significance and Report Format and Content Requirements for Wildland Fire and Fire Protection, except any revisions to the Guidelines for Determining Significance presented in Chapter 4.0 must be approved by the DCAO~~

Approved, August 31, 2010

### Text

Approved  
March 19, 2007

First Revision  
December 19, 2008

Second Revision  
August 31, 2010

Third Revision  
\_\_\_\_\_

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Deputy CAO

## EXPLANATION

The risk of home losses and fatalities is a function of hazard (probabilities of fire frequencies or flame lengths), exposure (including home locations), and vulnerability (ease of defense or protection from structure ignition). Over the long term, wildfire activity in a region can also be strongly influenced by development patterns themselves. Therefore, development proposals should be evaluated according to how they will threaten (or protect) existing communities.

The development process provides a unique opportunity to mitigate wildfire risk at a neighborhood scale, rather than at the individual lot scale, which forms the basis of current building and fire code requirements. Planning a community with wildfire in mind requires integrating risk-reduction strategies into the design, layout, and development of homes and neighborhoods.

These Guidelines and information presented herein shall be used by County and Fire staff for the review of discretionary projects and environmental documents pursuant to the California Environmental Quality Act (CEQA). These Guidelines present a range of quantitative, qualitative, and performance levels for particular environmental effects. Normally, (in the absence of substantial evidence to the contrary), an affirmative response to any one Guideline will mean the project will result in a significant effect, whereas effects that do not meet any of the Guidelines will normally be determined to be “less than significant.” Section 15064(b) of the State CEQA Guidelines states:

“The determination whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on factual and scientific data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting.”

The intent of these Guidelines is to provide a consistent, objective and predictable evaluation of significant effects. These Guidelines are not binding on any decision-maker and do not substitute for the use of independent judgment to determine significance or the evaluation of evidence in the record. The County reserves the right to modify these Guidelines in the event of scientific discovery or alterations in factual data that may alter the common application of a Guideline.

The Fire Protection Plan also provides guidance for evaluating adverse environmental effects that a proposed project may have from wildland fire and establishes standards to ensure that development projects do not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

## LIST OF ACRONYMS

ALS	Advanced Life Support
BEHAVE+	BehavePlus (a wildfire modeling system)
BI	Burning Index (an indicator of wildfire potential intensity)
BLS	Basic Life Support
BOF	Board of Forestry, State of California
BTU	British Thermal Unit
CAG	California Attorney General
CAL FIRE	California Department of Forestry and Fire Protection
CBSC	California Building Standards Code
CFC	California Fire Code
CCFC	County Consolidated Fire Code, County of San Diego
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
CSA	County Service Area
CSFM	California State Fire Marshal
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
FAHJ	Fire Authority Having Jurisdiction
FBAN	Fire Behavior Analyst
FPD	Fire Protection District
FPP	Fire Protection Plan
FL	Flame Length (indicator of fireline intensity)
FMZ	Fuel Modification Zone
GIS	Geographic Information System
IAFC	International Association of Fire Chiefs
IBC	International Building Code
ICC	International Code Council
IFC	International Fire Code
IPCC	Intergovernmental Panel on Climate Change
ISO	Insurance Services Office
LAFCO	Local Agency Formation Commission
LBZ	Limited Building Zone
LRA	Local Responsibility Area
LUEG	Land Use & Environmental Group, a sub-division of County PDS
MOU	Memorandum of Understanding
MWD	Municipal Water District
NEC	National Electric Code
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFPA	National Fire Protection Association
PAHJ	Planning Authority Having Jurisdiction
PDS	Planning & Development Services, County of San Diego
RAWS	Remote Automated Weather Station

SANDAG	San Diego Association of Governments
SDCFPD	San Diego County Fire Protection District
SRA	State Responsibility Area
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WFCA	Western Fire Chiefs Association
WUI	Wildland Urban Interface

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## INTRODUCTION & SCOPE

The unincorporated portion of San Diego County encompasses approximately 2.3 million acres, or 3,570 square miles. Most of the unincorporated land, more than 90 percent, is either open space or undeveloped. This includes several large federal, state, and regional parklands that encompass much of the eastern portion of the County. Only 35 percent or about 807,000 acres of the unincorporated County is privately owned.

San Diego has a history of destructive wildfires. These wildfire events have highlighted that a more holistic approach to wildfire resiliency is needed. Actions can and should be taken at the Community level, the Neighborhood/Subdivision level, and at the individual Parcel/Building level.

Community planners, officials, developers, and residents also need to understand the relationship of their community to the surrounding area in the context of wildfire. Large scale landscape management and fire suppression needs should be considered including establishing and maintaining fuel breaks, managing community open spaces in-house or through contracted landscapers, and ensuring sufficient evacuation routes are available and well-marked. Local hazard mitigation plans should address wildfire risk and actions for the community as well as those required at the Neighborhood/Subdivision and Parcel/Building levels. As evidenced by recent fires, dry grasslands in combination with high winds and inconsistent implementation of Wildland Urban Interface (WUI) practices at various scales in the built and natural environment can pose a significant threat.

Neighborhood/Subdivision - Building owners, developers and design professionals need to incorporate natural hazard mitigation, especially for the wildfire hazard, when designing neighborhoods and subdivisions in striving for the perfect balance between economics and risk. There are many well-known practices and resources available. Community planners, designers, and engineers need to consider natural topography effects on wildfire and potential unintentional effects mitigation for one hazard can have on another.

Parcel/Building - Much research has been completed and communicated focusing on building and parcel level mitigation and this remains an important area of focus. Post fire damage assessments identify several instances of houses that had been hardened and established defensible space that survived, while houses around them burned to the ground.

This document provides guidance to planners, applicants, consultants, fire professionals and other interested parties for evaluating adverse environmental effects that a proposed project may have from wildland fire and establishes standards to ensure that development projects do not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

## **1.0 GENERAL PRINCIPLES AND EXISTING CONDITIONS**

### **1.1 Wildland-Urban Interface Ignition Factors**

Fires can ignite naturally or be caused by people. In the montane coniferous forests of the Southwest, lightning-ignited fires are abundant and human ignitions are far less important than in lower-elevation shrublands of southern California where lightning is uncommon and humans cause most of the fires (Keeley and Fotheringham 2003). Over 95 percent of fires in southern California shrublands are started by people, which has increased fire frequency and increased the chances of ignitions during Santa Ana winds (Keeley and Fotheringham 2003). In general, more people move to the shrublands than to the forests since most of the development in San Diego County is on the coastal plain and in the foothills. People living in the wildlands, traveling on roads built through the wildlands, and recreating in the wildlands can ignite wildland fires inadvertently. In addition, wildland fires are sometimes ignited by arsonists. All these situations create more opportunities for potential wildland fire danger to people and their structures.

There are three components necessary for ignition and combustion to occur. A fire requires fuel to burn, air to supply oxygen, and a heat source to bring the fuel to ignition temperature. After combustion occurs and a fire begins to burn, there are several factors that determine how the fire spreads: fuel, weather, and topography. These factors make the difference in fire intensity and speed.

Wildfires spread based on the type and quantity of fuel that surrounds it. Fuel includes anything from trees, underbrush, and dry grassy fields to homes. The amount of flammable material that feeds a fire is the “fuel load”. A large fuel load will cause the fire to burn more intensely and spread faster. The size and shape, arrangement, and moisture content of fuel all impact the fire. Fuels smaller in size, with a smaller ratio of surface area to volume, and larger spacing dry out and ignite faster during a wildfire.

Weather also plays a major role in the ignition, growth, and death of a wildfire. The weather factors are temperature, wind, and moisture. Higher temperatures dry the fuels and allow fires to ignite and burn faster and wind supplies additional oxygen and spreads the fire faster. Moisture, on the other hand, works against the fire. Humidity and precipitation make fuels harder to ignite and can slow a fire down and reduce its intensity.

Finally, topography can aid or hinder fire progression. Slope is the most important factor. Fire typically burns uphill at a faster rate as ambient wind usually flows uphill and the rising smoke and heat preheat the fuels up-slope.

Common causes of structure ignition are firebrands, direct flame contact, and radiant heat exposure.

### **1.1.1 Firebrands**

Firebrands are small, often smoldering embers which break off vegetative or structural materials during wildland fires and can loft up to several kilometers ahead of the main fire front, igniting new spot fires. Firebrands can be created from virtually any fuel source that is light enough to be blown upwards; however, vegetation is the most common source of firebrands. A burning structure also creates burning embers, particularly at collapse.

Firebrands are the leading cause of building ignition during wildland–urban fires. This is attributed both to direct ignition of material on, in, or attached to the building, and indirect ignition where they ignite vegetation or other combustible material near the building, which results in a radiant heat and/or direct flame contact exposure that ignites the building. Indirect ignition of a building can occur when embers accumulate on and ignite nearby combustible fuel, resulting in radiant heat or flame constant exposure. Flammable vegetation adjacent to (within ten feet of) a structure and other combustible materials (wood piles, combustible fences, decks, etc.) acts as a receptacle for fire brands, and will impact the structure.

Factors that influence ember accumulation near a building include building geometry, such as flat wall and re-entrant corners, building wind angle, wind speed and the surface roughness characteristics of the horizontal landscape close to the building. Experiments conducted at the Insurance Institute for Business & Home Safety (IBHS) Research Center using full-scale buildings provided a means to quantify ember accumulation on a mass per unit area basis and found ember accumulation was greatest at locations immediately adjacent to the building and higher wind speeds allowed more embers to reach the building.

### **1.1.2 Direct Flame Contact**

This occurs when flames are in direct contact with the structure, igniting combustible materials. Direct flame contact is the most aggressive type of fire spread, which can be caused by ember deposition on a vulnerable material.

Flame impingement, a form of heat conduction, involves heat transfer from a flame that directly strikes a structure, potentially causing ignition of the structure. Flame size and the duration of flame impingement directly affect the potential for ignition of a structure.

### 1.1.3 Radiant Heat Exposure

Radiant heat is the thermal energy you feel when standing next to a fire. As this energy is transferred to nearby materials, their temperature rises, and a vulnerable material will ignite once a critical temperature is reached. In this scenario, the heat source can be a burning woodpile, outbuilding, shrub, or the approach of the fire front itself.

Radiation is energy transfer that travels across space without the need for intervening medium such as air. Examples in wildfires include ignition of light combustibles in advance of the flame front, like dry fine grasses or curtains behind a window. Radiation does not require flames to strike a structure to cause ignition. The source of flame radiation is the flame front. Dependent on the length, height, and width of the flame- front (the leading edge of a wildland fire), and the flame duration, an unprotected structure can be ignited by radiant heat.

## 1.2 Wildfire Risk in San Diego County

The risk to homes in San Diego County, defined as the integration of wildfire likelihood (probability of wildfire occurring) and wildfire intensity (the energy release by a wildfire) with expected consequences to homes, is greater than 64% of California counties. The wildfire likelihood, or annual probability of a wildfire occurring in a specific location, is greater than in 65% of California counties.

Nationally, the risk to homes in San Diego is greater than in 95% of counties and the likelihood of wildfire is greater than in 94% of counties. (A Profile of Wildfire Risk, San Diego County, CA, Headwaters Economics, Economic Profile Systems, August 31, 2023).

The USDA Forest Service also assesses wildfire risk nationally and states San Diego County has a very high risk of wildfire – higher than 95% of counties in the US: (<https://wildfirerisk.org/wp-content/uploads/2020/04/WRC-Info-Sheet-2020-04.pdf>)

**FIGURE 1: Risk to Homes/Wildfire Likelihood**



## 2.0 ADOPTED PLANS & GUIDELINES

### 2.1 General Plan

All cities and counties in California are required by state law to adopt a general plan, which sets forth a long-term vision of a community's future. Each general plan to address a minimum set of mandatory elements: land use, circulation, housing, conservation, open space, noise, and safety.

In 2011, the Board of Supervisors approved the update to the County's General Plan. Major changes to the General Plan included:

- Reduced Land Use Capacity by 46,363 units (15%) to 239,984 units,
- Focused development in village cores to retain the county's rural character,
- Shifted 20% of the remaining Dwelling unit capacity to the most western portions of the unincorporated area, and
- Located 80% of the Dwelling Unit Capacity where water can be imported and distributed by the County Water Authority.

#### 2.1.1 Land Use Element

The Land Use Element provides a framework to accommodate future development in an efficient and sustainable manner that is compatible with the character of unincorporated communities and the protection of valuable and sensitive natural resources. Relevant findings include:

- Most new development—approximately 80 percent—is planned within the County Water Authority (CWA) boundary.
- Focusing development in and around existing unincorporated communities allows the County to maximize existing infrastructure, provides for efficient service delivery, and strengthens town center areas while preserving the rural landscape that helps define the unique character of the unincorporated County.
- Related Land Use Elements adopted:
  - LU-6.9 Development Conformance with Topography.** Require development to conform to the natural topography to limit grading; incorporate and not significantly alter the dominant physical characteristics of a site; and to utilize natural drainage and topography in conveying stormwater to the maximum extent practicable.
  - LU-6.10 Protection from Hazards.** Require that development be located and designed to protect property and residents from the risks of natural and man-induced hazards.
  - LU-6.11 Protection from Wildfires and Unmitigable Hazards.** Assign land uses and densities in a manner that minimizes development in extreme, very high and high fire threat areas or other unmitigable hazardous areas.

### 2.1.2 Housing Element

The current Housing Element of the General Plan, April 15, 2021, through April 15, 2029, contains the following relevant considerations:

- Considerations included fire and other environmental risks during the development of the **Sites Inventory**. Units located within very high fire hazard risk areas were screened out from the Sites Inventory. Additional actions taken included removing units located within floodways, steep slopes, and sensitive habitats.
- **ADUs Affordable Accessory Dwelling Units (ADUs)**. By 2023, develop a program and pursue funding to spur the development of affordable housing through the construction of ADUs.
- **Senior Housing Program Options**. Explore the feasibility of developing a program that would facilitate/remove barriers to senior and assisted living housing development, and return to the Board with recommendations.

### Safety Element

California Government Code Section 65302 (g) was amended to include wildfire related requirements that should be addressed in a community's general plan safety element. These requirements are organized into five subsections applicable to structural development which are found in the San Diego County General Plan, Section 7-Safety Element, are summarized below:

- 65302 (g) (1) identifies the primary hazards/issues that should be included in the safety element, which include: seismically induced surface rupture, ground shaking, ground failure, slope instability leading to mudslides and landslides, tsunami, seiche, dam failure, flooding, subsidence, liquefaction, other geologic hazards, wildland and urban fires, evacuation routes, military installations, peak load water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards
- 65302 (g) (3) adopted through SB 1241 (2012) identifies the requirements for updating wildfire mapping, information, and goals and policies to address wildfire hazards
- 65302 (g) (4) adopted through SB 379 (2015) identifies the requirements for updating the safety element to address potential impacts associated with climate change and potential strategies to adapt/mitigate these hazards
- 65302 (g) (5) adopted through SB 99 (2019) requires identification of specified evacuation constraints associated with residential developments
- 65302 (g) (9) allows cities to adopt a County Safety Element if adequate detail is provided to address city level concerns



The purpose of the Safety Element within the General Plan is to include safety considerations in the planning and decision-making process by establishing policies related to future development that will minimize the risk of personal injury, loss of life, property damage, and environmental damage associated with natural and human-caused hazards. The County’s Element addresses natural hazards and human activities that may pose a threat to public safety within nine topic areas that include Hazard Mitigation Planning and Disaster Preparedness, Evacuations, Fire Protection and Emergency Response, and Climate Change.

The Safety Element provides policy direction that supports laws and regulations related to safety hazards and policies that support the guiding principles established for this General Plan. Of these key topic areas, wildfires, flooding, climate change, and geological and seismic hazards pose the greatest challenges to the County.

The following summarizes polices adopted by San Diego County regarding wildfire risks and development:

<b>San Diego County General Plan-Safety Element</b>	
<i>Policies</i>	
<b>Public Safety</b> S-1.7 Community Plan Updates	A series of criteria for community plan updates that incorporate public safety components.
<b><i>GOAL S-2 Evacuation. Enhanced public safety through effective evacuation planning and establishment of an effective evacuation network.</i></b>	
<b>Evacuations</b> S-2.1 Future Fire Protection Plans	Future Fire Protection Plans shall evaluate evacuations in accordance with the evacuation standards adopted by the San Diego County Fire Protection District.
<b>Evacuations</b> S-2.2 Evacuation Impediments	Advise, and where appropriate, require all new developments to help eliminate impediments to evacuation within existing community plan areas, where limited ingress/egress conditions could impede evacuation events.
<b>Evacuations</b> S-2.3 Community Plan Evacuation	Identify community plan areas that have reduced or limited circulation access and develop an evacuation plan, including an Evacuation Traffic Management Plan and recommended improvements to ensure adequate evacuation capabilities. Community Evacuation Plans should be evaluated and revised to address changes in at-risk areas and populations to ensure effectiveness.
<b>Evacuations</b> S-2.4 Prioritize CIP Roadways	Future CIP projects should prioritize roadways that serve as evacuation routes or require roadway improvements to better function under evacuation purposes.
<b>Evacuations</b> S-2.5 Existing Development within Hazard Zones	Implement warning systems and evacuation plans for developed areas located within known hazard areas (i.e., flood, wildfire, earthquake, other hazards).

<p><b>Evacuations</b> S-2.6 Effective Emergency Evacuation Programs</p>	<p>Develop, implement, and maintain an effective evacuation program for areas of risk in the event of a natural or human-caused disaster.</p>
<p><b>Evacuations</b> S-2.7 Evacuation Access</p>	<p>All development proposals are required to identify evacuation routes at the Community Plan level and identify and facilitate the establishment of new routes needed to ensure effective evacuation. Evacuation routes should be incorporated into existing Community Wildfire Protection Plans where available.</p>
<p><b><i>GOAL S-4 Minimized Fire Hazards. Minimize injury, loss of life, and damage to property resulting from structural or wildland fire hazards.</i></b></p>	
<p><b>Minimized Fire Hazards</b> S-4.5 Access Roads</p>	<p>Require development to provide additional access roads where feasible to provide for safe access of emergency equipment and civilian evacuation concurrently. The width, surface, grade, radius, turnarounds, turnouts, bridge construction, and lengths of fire apparatus access roads shall meet the requirements of the State Fire Code and the San Diego County Consolidated Fire Codes. All requirements and any deviations will be at the discretion of the Fire Code Official.</p>
<p><b>Regional Fire Protection</b> S-6.4 Regional Evacuation Coordination</p>	<p>Coordinate with State and Federal landowners regarding joint use and access agreements for roadways located on state and federal lands that can be used for evacuation purposes.</p>
<p><b>Defensible Development.</b> S-4.1</p>	<p>Require development to be located, designed, and constructed to provide adequate defensibility and minimize the risk of structural loss and life safety resulting from wildland fires.</p>
<p><b>Development in Hillsides and Canyons</b> S-4.2</p>	<p>Require development located in wildland areas, near ridgelines, top of slopes, saddles, or other areas where the terrain or topography affects its susceptibility to wildfires to be located and designed to account for topography and reduce the increased risk from fires. Density reduction may be necessary to reduce fire hazards if the location and design of the development cannot reduce the threat effectively.</p>
<p><b>Minimize Flammable Vegetation</b> S-4.3</p>	<p>Site and design development to minimize the likelihood of wildfire spreading to structures by minimizing pockets or peninsulas or islands of flammable vegetation within a development.</p>
<p><b>Service Availability</b> S-4.4</p>	<p>Plan for development where fire and emergency services are available or planned.</p>
<p><b>Access Roads</b> S-4.5</p>	<p>Require development to provide additional access roads where feasible to provide for safe access of emergency equipment and civilian evacuation concurrently. The width, surface, grade, radius, turnarounds, turnouts, bridge construction, vegetative management and brush clearance around roadways, and lengths of fire apparatus access roads shall meet the requirements of the State and San Diego County Consolidated Fire Codes. All requirements and any deviations will be at the discretion of the Fire Code Official of the FAHJ.</p>

<b>Fire Protection Plans</b> S-4.6	Ensure that development located within fire hazard areas implement measures in a Fire Protection Plan that reduce the risk of structural and human loss due to wildfire. Mitigation measures identified in the Fire Protection Plan should be implemented and may include, but are not limited to, the use of ignition resistant materials, multiple ingress and egress routes, and fire protection systems
<b>Fire Resistant Construction</b> S-4.7	Require all new, remodeled, or rebuilt structures to meet current ignition resistance construction codes and establish and enforce reasonable and prudent standards that support retrofitting of existing structures in high fire hazard areas.
<b>Fire Threat Reduction</b> S-4.8	Reduce human-caused fires with a high visibility prevention program in all publicly accessible wildfire prone areas.
<b><i>GOAL S5- Managed Fuel Loads. Managed fuel loads, including ornamental and combustible vegetation.</i></b>	
<b>Fuel Management Programs</b> S-5.1	Support programs and plans, such as Strategic Fire Plans, consistent with state law that requires fuel management and modification, and that balance fuel management needs to protect structures with the preservation of native vegetation and sensitive habitats.
<b>Coordination to Minimize Fuel Management Impacts</b> S-5.2	Consider comments and recommendations from CAL FIRE, U.S. Forest Service, local fire districts, and wildlife agencies regarding the mitigation of impacts to habitat and species for fuel management projects.
<b>Forest Health</b> S-5.3	Encourage the protection of woodlands, forests, and tree resources and limit fire threat through appropriate fuel management such as removal of dead, dying, and diseased trees.
<b>Regional Coordination Support</b> S-6.1	Advocate and support regional coordination among fire protection and emergency service providers.
<b>Fire Service Provider Agreements</b> S-6.2	Encourage agreements between fire service providers to improve fire protection and to maximize service levels in a fair, efficient, and cost-effective manner.
<b>Reassessment of Fire Hazards</b> S-6.3	Coordinate with fire protection and emergency service providers to reassess fire hazards after wildfire events to adjust fire prevention and suppression needs, as necessary, commensurate for both short- and long-term fire prevention needs.
<b>Regional Evacuation Coordination</b> S-6.4	Coordinate with State and Federal landowners regarding joint use and access agreements for roadways located on state and federal lands that can be used for evacuation purposes.

<b>GOAL S-7 Adequate Fire and Medical Services.</b> <i>Adequate levels of fire and emergency medical services (EMS) in the unincorporated county.</i>	
<b>Water Supply</b> S-7.1	Ensure that water supply infrastructure adequately supports existing and future development and provides adequate water flow to combat structural and wildland fires. Water systems shall equal or exceed the California Fire Code, California Code of Regulations, or, where a municipal-type water supply is unavailable, the latest edition of National Fire Protection Association (NFPA) 1142, "Standard on Water Supplies for Suburban and Rural Fire Fighting."
<b>Funding Fire Protection Services</b> S-7.2	Require development to contribute its fair share towards funding the provision of appropriate fire and emergency medical services as determined necessary to adequately serve the project.
<b>Fire Protection Services for Development</b> S-7.3	Require that new development demonstrate that adequate fire services can be provided that meet the minimum staffing of personnel and that meet the minimum travel times (see Section 5.9).
<b>Concurrency of Fire Protection Services</b> S-7.4	Ensure that fire protection staffing, facilities, and equipment required to serve development are operating prior to, or in conjunction with, the development. Allow incremental growth to occur until a new facility can be supported by development.

## 2.2 General Plan Implementation Plan

The Implementation Plan contains actions and procedures necessary to achieve the goals and policies set forth in the San Diego County General Plan. The broad array of actions, strategies, and processes undertaken to implement the General Plan will help achieve the County's vision for its growth and development. Applicable guidance includes:

- **6.2.1G Minimizing Risks.** Implement County Guidelines for Determining Significance for Wildland Fires & Fire Protection, to ensure development projects do not unnecessarily expose people or structures to a significant risk of loss from wildland fires, and apply appropriate mitigation when impacts are significant.
- **6.2.2B Weed Abatement Ordinance.** Implement the Combustible Vegetation and Other Flammable Materials Ordinance (Weed Abatement Ordinance) and require prudent brush management techniques to enforce proper techniques for maintaining defensible space around structures. The Weed Abatement Ordinance addresses the accumulation of weeds and rubbish on a private property in the unincorporated County outside fire districts' jurisdictions that is found to be a fire hazard and requires brush management around new and existing structures to protect life and structures from wildfires. The desire is to provide consistent weed abatement within all fire districts.
- **6.2.2D Resource Management Plans.** Implement procedures to require Resource Management Plans to ensure brush management requirements are being implemented and that habitat-specific fire controls are addressed. Resource Management Plans are reviewed during development review to implement brush

management requirements. Ensure that any variance or project approval does not result in a transfer of brush management responsibilities to another jurisdiction.

- **6.2.2E Brush Management in Development Projects.** Coordination with the Local Fire Agency Having Jurisdiction (LFAHJ) to ensure that district goals for fuel management and fire protection are being met. LFAHJ enforcement implements brush management requirements for discretionary development projects.
- **6.2.2F Vegetation Management.** Implement the Vegetation Management procedures to manage vegetation in the unincorporated County to reduce the risk of wildland fires. Development projects are required to provide adequate defensible space as part of project processing; the County shall work closely with the local fire authority in identifying the areas and amounts of vegetation treatments necessary to protect life and property.

### **2.3. Multijurisdictional Hazard Mitigation Plan (MJHMP)**

The Federal Disaster Mitigation Act of 2000 requires all local governments to create a disaster plan to qualify for hazard mitigation funding. The county last revised the plan in 2023 to reflect changes to both the hazards threatening San Diego County, as well as the programs in place to minimize or eliminate those hazards.

The County's MJHMP identifies major wildfires larger than 5,000 acres from 1950 through 2014, which have accounted for over 1,158,468 acres burned, affected over 8,400 structures (damaged/destroyed), and resulted in 30 deaths. Between 2014 and 2019, approximately 250 dwellings were destroyed from wildland fires, which accounted for 0.6% of total structures destroyed statewide by wildfire.

The topographic, geographic, and climatic conditions within the County lead to the overall regional fire problem. Over half of the land acreage of the unincorporated county is public land owned by the federal government, state government, or local government. Therefore, policies focus on minimizing the impact of wildfires through land use planning techniques and other mitigation measures. Key issues include:

- **Defensible Space/Fuel Modification Zones:** Fuel Modification Zones refers to a separation zone between wildlands and structures where fuels (including natural and ornamental vegetation), human-made combustible materials, and ancillary structures is managed or modified to minimize the spread of fire to the structure and allow space for defending structures from burning vegetation. This separation is important to improving the survivability of structures in a wildland fire event and is most readily maintained when planned for as part of project design.
- **Wildland Urban Interface:** The wildland urban interface (WUI) refers to areas where structures and other human developments meet or intermingle with undeveloped wildland. Much of the unincorporated county is located within the WUI.
- **Home Hardening:** For optimal protection against wildfires, structures should also be "hardened" to make them more ignition resistant. Limit structure vulnerability using

construction techniques (during new construction or home improvements) that include closed eaves, ember vents, Chapter 7A construction standards, five feet of hardscape around outer walls of structures, and other elements to reduce wildfire vulnerability.

- **Strategic Vegetation Management:** Outside of fuel modification zones around structures, reducing, thinning, or otherwise modifying the amount of vegetation (fuel) may reduce the risk of wildfire within conifer forests as well as through strategic fuel breaks near the WUI in low wind conditions.
- **Protection of Evacuation Corridors:** Development in the WUI to include multiple access/egress routes when the maximum dead-end road distance is exceeded.
- **Funding Fire Services:** Existing funding for fire services is limited and variable. Full-time funding for fire services is crucial for assuring long-term commitment of adequate coverage.
- **Travel Time Standards:** The minimum travel time standards to respond to a fire hazard or medical emergency facilitate the ability to identify future fire facility needs and to determine public service requirements for proposed development. Travel time standards indicate that expectations for service levels are different in urbanized areas than in rural areas.
- **Building and Site Design:** Requiring the location of structures to minimize the risk from wildland fires.

### 3.0 APPLICABLE REGULATIONS

While myriad plans serve as the policy foundation for addressing the WUI, regulations provide communities with the legal means to implement these policies. WUI regulations can address both existing and future development in the WUI, including structures and attachments, roads and other infrastructure, landscaping, current and future land uses, and additional development features.

Communities have a variety of regulatory options for addressing the WUI and related wildfire hazard conditions. Like plans, there are some state regulations, such as building codes, that must be adopted by local communities when tied to specific fire hazard severity zones or SRA. Other regulations are adopted voluntarily at the local level. Collectively, these tools can be implemented at a range of scales: from the larger community-level scale, through the neighborhood or subdivision scale, down to the individual building or lot scale. They provide planners with options for reducing risk through different interventions, such as locating specific uses away from wildfire hazard areas, creating effective landscaping ordinances that are compatible with multiple objectives, and ensuring communities have safe evacuation routes.

### **3.1 Building and Fire Code**

Wildfire requirements in the California Building Standard Code (CBSC) are designed to establish minimum standards for the protection of life and property by increasing the ability of buildings to resist the intrusion of flames or burning embers projected by a vegetation fire and reducing structure losses.

Minimum wildfire requirements and referenced performance-based test standards for building construction are found in different parts of the CBSC: Part 2 - California Building Code, Chapter 7A Materials and Construction Methods for Exterior Wildfire Exposure (typically referred to as “Chapter 7A”) and Chapter 15 Roof Assemblies and Rooftop Structures; Part 2.5 - California Residential Code; Part 9 - California Fire Code; and Part 12 - California Referenced Standards Code. Similar wildfire protection requirements for mobile homes and other types of manufactured buildings are regulated by the California Department of Housing and Community Development (HCD) (CCR Title 25).

The Office of the State Fire Marshal (OSFM) is responsible for promulgating wildfire safety regulations based on Health and Safety Code § 13108.5. State law designates where CBSC wildfire requirements shall apply based on fire hazard severity zone classifications in the SRA and Local Responsibility Area (LRA).

California Health and Safety Code Sections 17922, 17958, 17958.5 and 17958.7 provide that the County adopt the California Fire Code by reference as the County’s own fire code (**County Fire Code**) and make such changes or modifications that the Board of Supervisors expressly finds are reasonably necessary because of local climatic, geological, or topographical conditions.

#### **3.1.1 County Fire Code/Consolidated County Fire Code**

The California State Fire Code, contained in the CBSC, establishes minimum requirements for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, panic, or dangerous conditions in new buildings & structures and a reasonable level of safety to firefighters and emergency responders during emergency operations.

The County adopts modifications and makes changes to the California Fire Code that are reasonably necessary because of the County's climatic, geological, and topographical conditions. The County Consolidated Fire Code is the County Code, amended as needed by 11 other Fire Districts in the County including:

Note: Borrego Springs Fire Protection District and Ramona Fire Department (Municipal Water District) consolidated into SDCFPD in 2023.

Alpine Fire Protection District  
Bonita-Sunnyside Fire Protection District  
Deer Springs Fire Protection District\*  
Lakeside Fire Protection District  
North County Fire Protection District  
Rancho Santa Fe Fire Protection District  
Rincon Del Diablo Municipal Water District\*\*  
San Marcos Fire Protection District  
San Miguel Fire Protection District  
Valley Center Fire Protection District  
Vista Fire Protection District

\* Fire service provided by San Diego County Fire Protection Dist.

\*\*Fire Service provided by Escondido City Fire Dept.

It is important for users to know the Fire Agency Having Jurisdiction (FAHJ) when referencing this document.

Specific to wildfire, the California State Fire Code contains Chapter 49 – Requirements for Wildland- Urban Interface Fire Areas. This chapter provides minimum standards for hazardous vegetation and fuel management, defensible space, and building construction in accordance with other state codes and regulations. Other chapters and appendices in the state fire code establish minimum standards for emergency access and water supply for fire response.

In April 2023, the Board of Supervisors adopted an ordinance moving the requirements for defensible space from the Defensible Space for Fire Protection Ordinance to the County Fire Code for efficiency and clarity.

### **3.1.2 County Building Code**

The County adopts modifications and makes changes to the California Building Code that are reasonably necessary because of the County's climatic, geological, and topographical conditions. The County also amends and adopts the International and California Building Code by reference. Together, these documents are the County Building Code.

The County Building Code revises and replaces Chapter 7A Materials and Construction Methods for Exterior Wildfire Exposure, in its entirety, to address building materials, system, and/or assemblies used in the exterior design and construction of new and remodeled buildings located within a wildland-urban interface fire area.



### **3.2 Fire Safe Regulations**

Public Resources Code § 4290 requires the California State Board of Forestry and Fire Protection to adopt regulations for minimum fire safety standards related to defensible space, road standards for fire equipment access, standards for signs identifying streets, roads, and buildings, minimum private water supply reserves for emergency fire use, fuel breaks and greenbelts, and measures to preserve undeveloped ridgelines to reduce fire risk and improve fire protection. These regulations are known as the Fire Safe Regulations and are codified in CCR, Title 14 (Natural Resources), Division 1.5 (Department of Forestry), Chapter 7 (Fire Protection) under Subchapter 2. The Fire Safe Regulations apply to the perimeters and access to all residential, commercial, and industrial building construction within State Responsibility Areas (approved after January 1, 1991) and lands classified and designated as VHFHSZs (approved after July 1, 2021).

The State Board of Forestry and Fire Protection is also required to periodically update regulations for fuel breaks and greenbelts for greater fire safety. These regulations do not supersede local regulations which equal or exceed minimum regulations adopted by the State.

### **3.3 Subdivision Ordinance**

Subdivision ordinances describe the conditions and procedures under which land may be subdivided. The Subdivision Map Act (GC § 66410, et seq.) establishes the basic subdivision procedures, while giving local government the authority to regulate the design and improvement of subdivisions, require dedications of public improvements, require payment of impact fees, and require compliance with the objectives and policies of the general plan. These regulatory powers can promote land use, circulation, open space and safety element objectives, policies, and implementation measures.

Regulation of subdivision design can address wildfire safety by incorporating measures such as emergency access, adequate infrastructure and facilities, separation between buildable lots and wildland areas, fuels reductions and fire protection measures such as residential sprinkler systems in homes abutting open space or where there is inadequate water for structural fire suppression. Local governments can also require dedication of public improvements and land (through fee title or easements) to serve the subdivision.

A tentative subdivision map or parcel map cannot be approved unless the county finds that the subdivision, together with design and improvement conditions, is consistent with all aspects of the general plan or any applicable specific plan (GC § 66474). Two of the findings that can cause a subdivision to be denied are (1) that the site is physically ill-suited for the proposed type or density of the development or (2) that the subdivision's design or improvements are likely to cause substantial environmental damage or cause public health or safety problems (GC § 66474). These are important considerations for counties who are reviewing subdivision proposals in areas that are subject to wildland fire hazard.

Standards are established to protect public health and safety by reducing and mitigating hazards associated with wildfire that could affect development proposals in the Fire Hazard Severity Zone (FHSZ). The provisions apply to all lands in the FHSZ unless otherwise provided in the County Code or state law.

1. The applicant should consult with Public Works and the Fire Department regarding, but not be limited to, an evaluation of slope, aspect, fire topography, fire history/potential, habitat, adjacent properties (existing structures, fuel modification, habitat, parkland status), existing vegetation, fuel modification, type of plants to be planted on site, fire hydrant locations and fire flows, and access standards (e.g., width, grade, slope, paving, overhead clearance).
  - After consulting with Public Works and the Fire Department, the applicant shall prepare all necessary plans, including but not limited to a site plan for the proposed project that includes all mitigation measures necessary to comply with the recommendations and requirements of those agencies. The site plan shall show all aspects of development including, but not limited to, grading, construction of retaining walls or flood control devices, fuel modification areas, accessways, water lines, and irrigation systems necessary to mitigate any hazards on the property.
2. **Required Findings and Analysis.** Written findings of fact, analysis and conclusions addressing fire hazards must be included in support of all approvals, denials or conditional approvals of development located on a site. Such findings shall address the specific project impacts relative to the applicable development standards. The findings shall explain the basis for the conclusions and decisions of the County and shall be supported by substantial evidence in the record. Approval for the proposed development shall only be granted if the County's decision-making body is able to find that:
  - The project, as proposed, will be designed to minimize fire hazards due to project design, location on the site or other reasons.

- The project, as conditioned, will not have significant adverse impacts on fire hazards due to required project modifications, landscaping or other conditions. If found to be necessary to conform to the development standards or other provision of the County Code, the proposed development shall be modified, by special condition, relative to height, size, design, or location on the site and may be required to incorporate other methods to avoid or minimize fire hazards. If special conditions of approval are required to bring the project into conformance, the findings shall explain how the special condition(s) alleviate or mitigate the adverse effects that have been identified.

3. **Development Standards.** All new development shall be sized, sited, and designed to minimize risks to life and property from fire hazard, considering changes to fire risk caused by increasing global temperatures. In addition, all new development shall comply with the following requirements:

- New development shall be required to use design and construction techniques and materials that minimize risks to life and property from fire hazard. Structures shall be constructed with appropriate features and building materials, including but not limited to fire-resistant exterior materials, windows and roofing; and eaves and vents that resist the intrusion of flame and burning embers. Development sites and structures shall be located off ridgelines and other dangerous topographic features such as chimneys, steep draws, and saddles.
- New development shall incorporate fuel modification and brush clearance techniques and shall be designed and carried out to minimize clearance of natural vegetation and reduce impacts to sensitive natural habitat to the maximum extent feasible.
- New development shall provide for emergency vehicle access and adequate fire-flow water supply in compliance with applicable fire safety regulations. Development in areas with insufficient access, water pressure, fire flows, or other accepted means for adequate fire protection shall be prohibited.
- Prior to development approval, all new development shall demonstrate the availability of an adequate water supply for fire protection in compliance with applicable fire safety regulations. Where feasible, alternative water resources for fire-fighting purposes shall be maintained on development sites. Water tanks shall be sized consistent with County minimum requirements and clustered with approved structures.

- Residential structures shall be clustered to provide for more localized and effective fire protection measures such as consolidation of required fuel modification and brush clearance, fire break maintenance, firefighting equipment access, and water service. Structures shall also be located along a certified all-weather accessible road, which in some cases may consist of permeable surfaces, in a manner that provides firefighters adequate vehicle turnaround space on private properties. Where feasible, new development shall be accessed from existing roads.
4. As a condition of approval of new development within or adjacent to an area subject to high wildfire hazards, prior to development approval, the property owner shall be required to submit a signed document that shall indemnify and hold harmless the County, its officers, agents, and employees against any and all claims, demands, damages, costs, and expenses of liability arising out of the acquisition, design, construction, operation, maintenance, existence, or failure of the permitted project in an FHSZ.

BEST PRACTICE: Los Angeles County's subdivision regulations limit the number of lots that can be located on a single point of access. These regulations were established to control the number of County residents who may be placed at risk need to evacuate, limit the number of structures that may be destroyed, and reduce the risks to firefighters created in defending those structures. This is particularly important in limiting the development of new primary dwelling units in FHSZs as recent California legislation permitting up to two ADUs on many single-family lots significantly increases the existing risks by increasing the potential number of County residents that may be at risk when wildfire emergencies occur. Any increase in occupancy in FHSZs creates additional risk, regardless of whether occupancy occurs in primary dwelling units or ADUs.

### **3.4 Memorandum of Understanding**

An MOU was created to establish guidelines by which CAL FIRE and local fire districts can continue to engage in fuel management activities and the USFWS and CDFG can assess, minimize, and account for potential adverse impacts to habitats and species from such activities. Agreement between the United States Department of Interior Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), CAL FIRE, San Diego County Fire Chief's Association and the Fire District's Association of San Diego County is available at (<http://www.sdcounty.ca.gov/dplu/Resource/docs/3~pdf/MemoofUnder.pdf>).

### **3.5 Other Applicable Regulations and Recognized Standards**

Other regulations and recognized standards that should be referenced:

- National Environmental Policy Act, (43 USC 4321 et seq.). This Federal regulation considers potential public health and safety hazards, including wildfires, when considering environmental impacts of proposed federal projects.
- International Wildland-Urban Interface Code. This is a model code published by the International Code Council which may be adopted by a jurisdiction.
- Standard for Wildland Fire Protection (NFPA 140). This standard, published by the National Fire Protection Association, consolidated several previous standards related to wildfire (NFPA 1051, 1141, 1143, and 1144) into a single document.
- The National Cohesive Wildland Fire Management Strategy. This plan represents a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress towards the three goals: Resilient Landscapes, Fire Adapted Communities, Safe and Effective Wildfire Response. Last updated in July 2023, it is an excellent strategy toward the vision to “Safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and collectively, learn to live with wildland fire.”
- California Strategic Fire Plan, 2018, is the State’s road map for reducing wildfire risk. The plan is a cooperative effort between the State Board of Forestry and CAL FIRE and looks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to overall ecosystem health.
- Community Wildfire Protection Plan is a planning and funding prioritization tool created by the Healthy Forests and Restoration Act of 2003 as an incentive for communities to engage in fire hazard planning and help define and prioritize local implementation and funding needs. Thirty-five communities around San Diego County have an approved CWPP in place.

### **4.0 GUIDELINES FOR DETERMINING SIGNIFICANCE**

The California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq. requires lead agencies to detail specific risks for development in wildfire-prone areas as part of the environmental review process, and to adopt all feasible mitigation measures. Those areas mapped by CAL FIRE as “High” or Very High” Fire Hazard Severity Zone, or related high-fire risk areas as designated by local ordinance must comply with these CEQA requirements.

#### **4.1 California State Attorney General Opinion**

The California State Attorney General (CAG) has litigated against development projects where the CEQA review was judged inadequate. (Some of these cases have been in San Diego County). The CAG has published “Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act” in October or 2022. The following is a synopsis of this report. The CAG has identified that;

- a. The rate of wildfire occurrence and severity of impact is increasing in California.
- b. Many of the increasing number of wildfires have been sparked by electrical sources such as power lines serving development, and other human activity.
- c. Wildfires can have a dramatic ecological impact leading to habitat loss and fragmentation, shifts in vegetative composition, reductions in animal populations, and accelerated loss of species.
- d. Wildfires can have adverse effects on erosion and water quality.
- e. Wildfires can have tragic consequences for California residents through loss of housing and property, health hazards posed from degradation of air quality.
- f. Social impacts of wildfire include desperate impact on low-income households that are chronically underinsured and the high public cost of wildfire suppression, including the increasing burden to limited Statewide firefighting resources.
- g. The introduction of more people into former wildlands through development increases the probability of wildfire ignition.
- h. Development of wildlands situates more people into “harm’s way” for wildfire exposure. In particular, the AG cites the lack of adequate evacuation planning or evacuation impediment due to lack of sufficient transportation infrastructure.

## 4.2 Lead Agency Determination

A lead agency must determine the appropriate level of CEQA compliance for each specific project. Commonly, a full Environmental Impact Report (EIR) is required, however smaller projects may comply with a Mitigated Negative Declaration. Determination for compliance occurs if the project may potentially have a significant impact on the environment and is not otherwise exempt from CEQA. Under CEQA, local jurisdictions may act as lead agencies with responsibility for preparing the EIR (or other CEQA document), or as responsible agencies relying on an EIR prepared by a lead agency. CEQA provides a critical process for local jurisdictions to understand how new developments will exacerbate existing wildfire risks, allowing them to consider project design features, alternatives, and mitigation measures that provide for smarter development and the protection of existing communities. It is recommended, in the CEQA response, these issues of concern to the CAG be fully detailed, and mitigations (if any) identified.

The CAG has identified recommended best practices to disclose, analyze, and mitigate wildfire impacts. The State of California has made available a checklist for determination of these impacts which can be obtained at the Office of Planning and Research website: <https://www.opr.ca.gov/docs/SB375-Intro-Charts.pdf> A checklist is also available that guides compliance in Appendix B.

Under CEQA, a full detailing of risk requires the following:

- a. A complete baseline description of the environmental character of the area proposed for development, including details regarding open spaces, habitat, and project related impacts.
- b. A detailed description of the fire history of the project site, including determination of historic wind and weather influences, geographic influences, vegetation condition and flammability, and likely wildfire behavior. Fire modeling or related spatial and statistical analysis is recommended to fully quantify wildfire risks.
- c. A detailed description of firefighting resource availability, including water supply.
- d. An analysis of “any significant environmental effects the project might cause or risk exacerbating by bringing development and people into the area affected,” including by locating development in wildfire risk areas.
- e. A determination of the following wildfire impact questions:
  1. Substantially impair an adopted emergency response plan or emergency evacuation plan;

2. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
3. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
4. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, because of runoff, post-fire slope instability, or drainage changes.

In addition to the four questions above, agencies must consider whether a project will “expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.” In answering these questions, lead agencies must consider both on- and off-site impacts.

### **4.3 Analyzing a Project’s Impacts**

The CAG recommends the local agency focus on three specific issues in the analysis of a project:

- 1) **Project Density:** Project density influences how likely a fire is to start or spread, and how likely it is that the development and its occupants will be in danger when a fire starts. Fire spread and structure loss is more likely to occur in low- to intermediate-density developments. This is because there are more people present to ignite a fire (as compared to undeveloped land), and the development is not concentrated enough.
- 2) **Project Location in the Landscape:** Project placement in the landscape relative to fire history, topography and wind patterns also influences wildfire risk. Although wildfire ignitions are primarily human caused in California, wildfire behavior is largely driven by topography, fuel, climatic conditions, and fire weather (such as low humidity and high winds). How a development project is planned within the landscape determines to what extent it will influence fire risk. For example, if a project site is in a wind corridor, above-ground power lines may become a source of ignition. Similarly, siting residential structures in rugged terrain or on the top of steep hills may increase the wildfire risk. By contrast, if a project site includes landscape features that could prevent or slow the spread of fire, such as a lake or an irrigated golf course, the development may be strategically located to capitalize on that feature as a natural fuel break.



- 3) **Water Supply and Infrastructure:** As part of evaluating a project's wildfire risk impacts, an environmental document should analyze the adequacy of water supplies and infrastructure to address firefighting within the project site. This analysis should consider the potential loss of water pressure during a fire, which may decrease available water supply and the potential loss of power, which may eliminate the supply.

Lead agencies are encouraged to develop thresholds of significance that either identify an increase in wildfire risk as a significant impact or determine, based on substantial evidence, that some increase in the risk of wildfires is not considered a significant impact. Relevant factors should include the project's impact on ignition risk, the likelihood of fire spread, and the extent of exposure for existing and new residents based on various fire scenarios. Modeling the various scenarios enables local agencies to quantify increased wildfire risks resulting from a project adding more people to wildfire prone areas and to assess the risks according to the threshold of significance.

Some environmental documents have concluded that the conversion of some wildland vegetation into paved development reduces or does not increase wildfire risk. This conclusion is contrary to existing evidence and the well-accepted understanding that the fundamental driver of increased wildfire risk is the introduction of people into a flammable landscape. Accordingly, the conversion of vegetation into developed land does not obviate the need for lead agencies to carefully consider and model how the addition of development into wildfire prone areas contributes to the risk of wildfire.

In San Diego County, the County Fire Chiefs Association and numerous fire agencies have completed Wildland-Urban Interface Fire Emergency Response Plans for many Wildland-Urban Interface and undeveloped areas of the County. A full detailing of existing environmental and wildfire risk conditions is included in these plans, as well as extensive wildfire modeling and fire behavior analysis. Most of these plans include detailed evacuation planning for the plan area. These plans should be consulted as part of a development environmental analysis.

#### **4.4 Analyzing Project Impact on Evacuation and Emergency Access**

The analysis of evacuation access and routing must analyze both the impacts on existing residents and routes as well as the adequacy of proposed routes for the new development.

The environmental document should evaluate these impacts both during construction and over the life of the project.

For projects located in high wildfire risk areas that present an increased risk of ignition and/or evacuation impacts, evacuation modeling and planning should be considered and developed at the time of project review and approval—when there is greater flexibility to modify a project’s design, density, siting, and configuration to address wildfire considerations—rather than deferred to a later stage of the development process.

Lead agencies will be best positioned to ensure proposed development projects facilitate emergency access and ease constraints on evacuation with this information in hand prior to project approval. The use of professional traffic engineering services to evaluate traffic flows is important to the assessment of proposed routes. The ultimate objective is to allow for informed decision-making that minimizes the environmental and public safety hazards associated with new developments that increase the risk of ignition and impede evacuation in high wildfire prone areas.

Local jurisdictions are encouraged to develop thresholds of significance for evacuation times. These thresholds should reflect any existing planning objectives for evacuation. According to the CA-AG, Evacuation modeling and analysis should include the following:

- a. Evaluation of the capacity of roadways to accommodate project and community evacuation and simultaneous emergency access.
- b. Assessment of the timing for evacuation.
- c. Identification of alternative plans for evacuation depending upon the location and dynamics of the emergency.
- d. Evaluation of the project’s impacts on existing evacuation plans.
- e. Consideration of the adequacy of emergency access, including the project’s proximity to existing fire services and the capacity of existing services.
- f. Traffic modeling to quantify travel times under various likely scenarios.

In considering these evacuation and emergency access impacts, lead agencies may use existing resources and analyses, but such resources and analyses should be augmented when necessary. For example, agencies should:

- a. Consider the impacts of emergency travel times during congested traffic periods.
- b. Consult with local fire officials and ensure that assumptions and conclusions regarding evacuation risk are substantiated with sound facts.
- c. Consider impacts to existing community evacuation plans. A goal of San Diego County will be to not negatively impact evacuation times for existing communities if new development is determined to use the same routes. New road improvements or infrastructure may be needed to achieve this goal.
- d. Consider simultaneous means of emergency vehicle response access commensurate with public evacuation.

#### **4.5 Temporary Shelter-in-Place**

The ability to temporarily shelter-in-place as an emergency measure is frequently an essential option, even though the primary objective may be to remove impacted civilians completely from the emergency area. Reasons for this measure include the following:

- a. Wildfires may originate very close to development and not allow enough time for public notice and safe evacuation, or evacuees may delay their departure until too late for safe transit.
- b. Wildfire rate of spread or trajectory may overcome evacuation routes with adjacent wildland exposure, posing lethal risk to evacuees on roadways.

For proposed development sites where evacuees must transgress open areas or wildlands during evacuation and may become exposed to wildfire risks while in transit, it will be essential to include areas of temporary safe refuge within planned development communities that may be used if these principal routes are compromised. These may include institutional sites such as schools, churches, or community administrative sites, large parking areas such as those for commercial complexes, parks, golf courses, or managed green belts. These sites must be readily accessible, with vehicle access that does not otherwise obstruct available roads, and managed fuel exposure that limits user exposure to products of combustion. Temporary safe refuge sites are not to a substitute for permanent or safe evacuation alternatives.

The principal evacuation plan should be to ensure movement of civilian populations from an emergency area into a known safe location where public services, emergency health care, fuel, food, water, and supplies may be made available.

Evacuation planning should include contingencies for large animal safety when such animals are present.

#### **4.6 Mitigating wildfire risk, evacuation, and emergency access impacts**

If a project presents significant increased wildfire risks and/or evacuation and access impacts, CEQA requires the lead agency to consider and adopt feasible alternatives and mitigation measures to avoid or reduce the project's impacts (or make a finding of overriding consideration).

According to the CAG, an EIR that concludes certain project design features or mitigation measures will reduce or eliminate all potential wildfire risks, without first describing those risks, fails to fully analyze the project's impacts. Compressing the analysis of impacts and mitigation deprives decision makers of a full description of the project's adverse impacts and, therefore, fails to equip the decision makers with the necessary information to properly address the impacts by adopting project design features, mitigation measures, or alternatives. To avoid this error and provide for better project design, the project EIR should fully analyze the increased wildfire risks and evacuation impacts.

The CAG has recommended alternatives in development plans that often mitigate wildfire risks. These include:

- a. Increasing housing density and consolidated design, relying on higher density infill developments as much as possible.
- b. Avoidance and minimization of low-density exurban development patterns or leapfrog-type developments (i.e., those with undeveloped wildland between developed areas).
- c. Decreasing the extent and amount of "edge," or interface area, where development is adjacent to undeveloped wildlands.
- d. Creation of buffer zones and defensible space within and adjacent to the development, with particular attention to ensuring that vegetation will not touch structures or overhang roofs. It is also important that legal obligations are structured so that defensible space measures are retained over time.
- e. Siting projects to maximize the role of low-flammability landscape features that may buffer the development from fire spread.
- f. Undergrounding power and telecommunications lines and hardening of utilities infrastructure.
- g. Limiting development along steep slopes and amidst rugged terrain, to decrease exposure to rapid fire spread and increase accessibility for firefighting, potentially consolidating development in sites with less risk.
- h. Placement of development close to existing or planned ingress/egress and designated evacuation routes to efficiently evacuate the project population and the existing community population, consistent with evacuation plans, while simultaneously allowing emergency access.
- i. Placement of projects close to adequate emergency services.
- j. Construction of additional points of ingress and egress and modification of evacuation routes to minimize or avoid increasing evacuation times or emergency access response times.
- k. Fire hardening structures and homes—upgrading the building materials and installation techniques to increase the structure's resistance to heat, flames, and embers—beyond what is required in applicable building codes, both for new structures and existing structures in proximity to the new development.
- l. Requiring fire-hardened communication to the project site including high-speed internet service.

- m. Enhanced communication to the project population about emergency evacuation plans and evacuation zones.
- n. Parking limitations to ensure access roads are not clogged with parked vehicles.
- o. On-site water supply/storage to augment ordinary supplies that may be lost during a wildfire.

The applicable rules, requirements, and analytical tools available to reduce wildfire risk are evolving. The CAG guidance is intended to provide suggestions for how best to comply with CEQA when analyzing and mitigating the wildfire risks of development projects in the wildland-urban interface and other fire prone areas.

## **5.0 FIRE PROTECTION PLANS**

To effectively mitigate wildland fire hazards in Southern California, a multi-lateral approach that involves federal, state, and local governments and fire agencies is usually necessary. Collectively, the County and fire agencies work together to prevent the loss of life in wildland fires; prevent the ignition of structures by wildland fires; prevent the encroachment of wildland fire upon communities; prevent a wildland-caused structural conflagration; prevent the spread of a structure fire to the wildland; and to limit the size of wildland fires.

Wildland fire mitigation measures and design considerations used in the planning and land use approval process vary depending on the wildland characteristics of the site and surrounding area. To allow this flexibility in project design, many wildland fire regulations are written using language that is often subject to interpretation (e.g., water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems ...) as opposed to codes that are absolute (e.g., "Class "A" roofing material shall be required"). This may allow some projects with unique geographic and topographic conditions to adequately mitigate wildland fire risks through project design.

A Fire Protection Plan (FPP) is a document that describes the level of fire hazard that would affect or be caused by a proposed development and the methods proposed to minimize that hazard. The FPP also evaluates the consistency of the proposed project with applicable fire protection regulations. To minimize hazards and meet fire code requirements, the FPP may include recommendations that involve limitations on future land use on the subject property, building construction standards, vegetation management, access improvements, installation of fire suppression facilities, and other design measures. The FPP must include measures to address the specific location, topography, geology, level of flammable vegetation and climate of the proposed project site. The FPP must be prepared consistent with applicable fire codes and be accepted by the FAHJ and County. The plan must demonstrate compliance with the applicable fire code or how the measures proposed to reduce fire hazards are adequate to meet the intent of the code. The following elements must be addressed in a FPP required as part of the review of a discretionary permit application:

- Wildfire hazard and risk assessment
- Siting of development
- Housing density considerations
- Construction
- Access, egress, and evacuation planning
- Water sources for firefighting
- Subdivision landscaping and vegetation management
- Protection of critical infrastructure
- Emergency Services - Availability and Travel Time

Each of these design considerations is detailed below and includes discussions on relevant federal, state, and local codes and the standards that are used to ensure compliance with the regulations. Failure to comply with either the fire code/regulations or the standards may result in a potentially significant impact.

## **5.1 WILDFIRE HAZARD AND RISK ASSESSMENT**

The effective use of wildfire hazard information in the early planning or entitlement phases of new development is critical to allowing the county to more comprehensively plan and design against potential loss of life, property, or other assets. It is fundamental that the evaluation of wildfire hazard conditions is not only conducted at the parcel level, but also the subdivision and community scales. The maps resulting from a wildfire hazard assessment can help communities to:

- decide where development should be encouraged or avoided;
- justify where regulations may be applied differently across the landscape;
- establish authority to make codes enforceable;
- require adequate fire protection standards;

- identify permitted and conditional land uses in higher risk areas;
- prioritize fuel reduction efforts;
- educate and communicate risk to the public; and
- empower county and city staff to act.

While the California Fire Hazard Severity Zones Maps are discussed below, also look at:

- Cal-Adapt
- CPUC Fire-Threat Maps and High Fire-Threat District
- US Wildfire Hazard Potential (firelab.org)
- USFS Wildfire Hazard Potential Tool and CALVEG Map
- CAL FIRE’s Wildfire Perimeters Map, WUI Map, and Landcover Map
- Fire Probability Models (Fire Probability and Carbon Accounting, SFM)
- CalOES MyHazards Tool

### **5.1.1 State Responsibility Areas**

The California Public Resources Code (PRC) Section 4102 defines “state responsibility area” (SRA) to mean areas of the state in which the financial responsibility of preventing and suppressing fires has been determined by the State Board of Forestry to be primarily the responsibility of the State. As of July 2020, approximately 31% of the state is within the SRA. For reference, 48% of the California is within the Federal Responsibility Area (FRA).

Public Resources Code sections 4201-4204 originally directed the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas (SRA) based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread.

There are three FHSZ designations, based on increasing fire hazard. Hazard is based on the physical conditions that create a likelihood and potential fire behavior over a 30 to 50-year period. Classification of a zone as Moderate, High, or Very High fire hazard is based on a combination of how a fire will behave and the probability of flames and embers threatening buildings. Each area of the map gets a score for flame length, embers, and the likelihood of the area burning.

The boundaries of the SRA are identified by the Board of Forestry and Fire Protection, as directed by PRC Section 4125, using the criteria provided in PRC Sections 4126-4135.

### 5.1.2 Local Responsibility Areas

Local responsibility area is defined as those areas of land classified by the Board of Forestry and Fire Protection where the financial responsibility of preventing and suppressing wildfires is not that of the state or federal government, pursuant to PRC section 4125. Approximately 21% of the state is within the LRA.

The “Bates Bill” (AB 337, 1992), Government Code Section 51175, was prompted by the devastating Oakland Hills Fire of 1991. The legislation calls for CAL FIRE to evaluate fire hazard severity in local responsibility area and to make a **recommendation** to the local jurisdiction where **very high FHSZs** exist. The Government Code then provides direction for the local jurisdiction to take appropriate action.

CAL FIRE used an extension of the state responsibility area Fire Hazard Severity Zone model as the basis for evaluating fire hazard in local responsibility area. The local responsibility area hazard rating reflects flame and ember intrusion from adjacent wildlands and from flammable vegetation in the urban area. Scientists at the U. C. Berkeley Center for Fire Research and Outreach provided an urban fuels model that was incorporated in the hazard rating.

CAL FIRE published a list of incorporated cities or areas within the LRA for which it has made recommendations on VHFHSZs. Local agencies were required to designate VHFHSZs within their jurisdictions within 120 days of receiving recommendations from the Director or file a finding supported by substantial evidence in the record that equivalent measure exist at the local level and the requirements of Section 51182 are not necessary for effective fire protection within the area. Many jurisdictions did not adopt the FHSZ designations in the LRA

### 5.1.3 Fire Hazard Map Update

The PRC requires maps to be periodically reviewed and revised. Since the maps were last updated in 2007, the PRC was revised to transfer responsibility for mapping to the State Fire Marshal (SFM). (GC § 51179(a)). Another PRC amendment will restrict local agency authority regarding VHFHSZs in the LRA to the *addition* of areas not identified as VHFHSZs by the SFM, as VHFHSZs following a finding supported by substantial evidence in the record that the requirements of Section 51182 are necessary for effective fire protection within the area (GC § 51179(b)).



Improved fire science, data, and mapping techniques available to identify the most effective measures for fire prevention, intensity, and spread prompted the SFM to revise the maps in 2022. The hazard mapping process incorporates new science in local climate data and improved fire spread modeling in determining hazard ratings. A two-kilometer grid of climate data covering the years 2003-2018 was used as the foundation for the model.

The previous model used stock weather inputs across the state to calculate wildland fire intensity scores. The updated model adjusts fire intensity scores based on the most extreme fire weather at a given location, considering temperature, humidity, and wind speed. In addition, ember transport is modeled based on local distributions of observed wind speed and direction values instead of using a generic buffer distance for urban areas adjacent to wildlands. A FHSZ class is assigned based on the average hazard across the area included in the zone.

The SFM reports the criteria used is science based and field tested. The factors influencing fire behavior and fire likelihood over 30 – 50 years are combined into the term “hazard” to refer to the physical conditions that create fire behavior that can lead to damage. Factors used include:

- Fire history
- Existing and potential fuel
- Predicted flame length
- Blowing embers
- Terrain
- Typical fire weather (temp, humidity, wind)

The new hazard maps, released in January 2023, more accurately reflect the zones in California that are susceptible to wildfire. The area designated VH was expanded from 48% → 55% of the SRA. The public comment period for SRA maps has been extended twice and is expected to be finalized in late 2023. The LRA maps are under development and release will be delayed until sometime in 2024.

#### 5.1.4 Hazard and Risk

The FHZ maps produced by the SFM depict hazards based on limited factors. As discussed on their website, there is a significant difference between hazard and risk. Whereas hazard is defined as physical conditions that can cause damage and is somewhat fixed, risk is the expected damage a particular hazard is estimated to produce and, therefore, varies. Therefore, the SFMs are descriptive of impacts (like flood maps) – no mitigation measures are considered.

Risk identifies where wildfire is most likely to threaten a community value (human life, property) and is defined by the combination of hazard, exposure, and vulnerability. Specifically, **Risk** can be designed as:

$$\begin{array}{ccc} \mathbf{Hazard} & \times & \mathbf{Vulnerability} \\ \textit{Likelihood: probability of wildfire starting \& spreading} & & \textit{Exposure: spatial overlap of wildfire and communities} \\ \textit{Intensity: the energy released by a wildfire)} & & \textit{Susceptibility: whether a community may be harmed} \end{array}$$

### **5.1.5 Fire Hazard Map Significance**

The requirements for legal compliance within the SFM's regulatory scope are not changed by the FHSZ classifications. In the SRA, fire prevention requirements within the SFM's regulatory authority are enforced uniformly. All locations in the SRA are subject to the same requirements, rights, responsibilities, conditions, prescriptions, or other regulatory elements within the SFM's jurisdiction.

However, separate statutory mandates outside of the SFM's regulatory scope require that all property in High or Very High FHSZs comply with Civil Code 1102.6f, real estate disclosures Assembly Bill 38 (Wood, Chapter 391, Statutes of 2019). These disclosures are known as "AB 38 Defensible Space Inspections," and are not required for property in Moderate FHSZs. As a result of the new maps, the boundaries of Moderate, High, or Very High FHSZs may shift, altering which properties are required to comply. However, every FHSZ in the SRA is already required to comply with the underlying defensible space requirements of AB 38 located in PRC Section 4291. Requirements include:

- California Building Code Chapter 7A: Materials and Construction Methods for Exterior Wildfire Exposure
- California Government Code 51182: Vegetation Clearance Requirements/Defensible Space
- Board of Forestry and Fire Protection Fire Safe Regulations (California Public Resource Code 4290, July 2021)
- Road Standards
- Signage
- Private Water Supply
- Fuel Breaks and Greenbelts

### **5.2 Siting of Development**

Location of development on the landscape is a major driver of its wildfire risk. Local site conditions (topography, vegetation characteristics, vegetation maintenance, proximity of fuels and other developments, weather, and orientation of a site) can markedly influence site-specific wildfire hazards and exposures (landscape level fire hazards). It is prudent to address fire risk before other considerations are finalized: concentrate in least hazardous areas and buffer against wildfires.

Fire modeling will highlight any vulnerabilities due to the presence of local topographic conditions (hilltops, ridges, steep slopes) and will show potential fire flow paths from neighborhood-or community level features such as greenbelts, open spaces, or drainages. Drainages and other communal open spaces provided an avenue for wildfire spread into more developed urban-suburban environments in several recent wildfires.

### **5.2.1 Siting Near Open Space**

Title 14/Fire Safe Regulations includes, in Section 1276.02, requirements related to ridgelines:

(a) The Local Jurisdiction shall identify Strategic Ridgelines, if any, to reduce fire risk and improve fire protection through an assessment of the following factors:

- (1) Topography;
- (2) Vegetation;
- (3) Proximity to any existing or proposed residential, commercial, or industrial land uses;
- (4) Construction where mass grading may significantly alter the topography resulting in the elimination of Ridgeline fire risks;
- (5) Ability to support effective fire suppression; and
  - (a) Other factors, if any, deemed relevant by the Local Jurisdiction.
  - (b) Preservation of Undeveloped Ridgelines identified as strategically important shall be required pursuant to this section.
  - (c) New Buildings on Undeveloped Ridgelines identified as strategically important are prohibited, as described in subsections (c)(1), (c)(2), and (c)(3).
- (6) New Residential Units are prohibited within or at the top of drainages or other topographic features common to Ridgelines that act as chimneys to funnel convective heat from Wildfires.
- (7) Nothing in this subsection shall be construed to alter the extent to which utility infrastructure, including but not limited to wireless telecommunications facilities, as defined in Government Code section 65850.6, subdivision (d)(2), or Storage Group S or Utility and Miscellaneous Group U Structures, may be constructed on Undeveloped Ridgelines.
- (8) Local Jurisdictions may approve Buildings on Strategic Ridgelines where Development activities such as mass grading will significantly alter the topography that results in the elimination of Ridgeline fire risks.
- (9) The Local Jurisdiction may implement further specific requirements to preserve Undeveloped Ridgelines.

The County Fire Code also has requirements for setbacks adjacent to protected areas. Buildings and structures shall be setback a minimum of 100 feet from any property line adjacent to a national forest, state park or open space preserve. This setback may be reduced when existing permitted buildings and structures are located within 100 feet of the property line or additional mitigation measures are employed that are satisfactory to both the FAHJ and the building official.

The following general guidance for siting a subdivision or development can also help reduce wildfire risk:

- Avoid selecting a construction site along a gully or in a narrow canyon
- Avoid selecting a construction site in or adjacent to a saddle or narrow mountain pass
- Avoid impacts to nature reserves, conservancies, similar public lands
- Avoid constructing a new development adjacent to or on a steep slope. If a ridgetop site is selected, consider the following:
  - Choose an area that allows for a minimum 30–100-foot setback from wildland vegetation on the downslope side.
  - Increase the setback at sites with heavier fuels such as in a forested environment.
  - Develop a fuel modification and long-term vegetation management plan for the steep slopes proximate to the development site. Given specific topographic and vegetative conditions more than 100 feet of defensible space will likely be needed. In some jurisdictions, this can be as much as 200+ feet (e.g., Los Angeles County and Orange County).
- Avoid constructing a new development adjacent to an unmanaged open or wildland space where 50 to 100 feet of defensible space cannot be provided on the proposed site. If a site is selected that is proximate to an unmanaged open or wildland space, consider the following design features:
  - Integrate inherent fuel breaks such as fruit orchards, irrigated landscaping/greenbelts, golf course or other similar low-wildfire hazard features.
  - Consider providing increased structural hardening measures for structures proximate to the open or wildland space such as 6-foot non-combustible perimeter walls or 1-hour fire-resistant exterior walls and protected openings.
  - Consider other building-scale defenses, e.g., building orientation relative to fire flow paths, debris and ember accumulation, window number, and orientation.

**BEST PRACTICE:** Siting requirement in the land-use development standards described in Santa Barbara County's Gaviota Coast Plan

*Dev Std LU-3: Fire Protection. Development shall be sited to minimize exposure to fire hazards and reduce the need for grading, fuel modification, and clearance of native vegetation to the maximum extent feasible. Building sites should be located in areas of a parcel's lowest fire hazard and should minimize the need for long and/or steep access roads and/or driveways.*

**BEST PRACTICE:** Marin County: County-wide agricultural land designation and more localized zoning and potential development patterns that take advantage of agricultural buffers. Site subdivision so they take advantage of major landscape features that can act as a lasting buffer (preserved over long term and protected from removal when rezoning).

**BEST PRACTICE:** Alberhill: Concentrate homes on the inner side of perimeter roads. Roads, sidewalks, and yards all become defensible space between wildlands and structures. Reduce the neighborhood's perimeter-to-area ratio, further separating homes from flammable hazards.

### **5.2.2 Siting Near Existing Development**

In recent catastrophic wildfire incidents (e.g., 2017 Camp Fire in Paradise, 2021 Marshall Fire in Colorado), fire spread rapidly not only via wildlands and other open spaces, but also from structure to structure (via direct flame contact, hot gases, radiation, and embers). Given the devastating influence nearby subdivisions can have during a wind-driven fire incident, the extent and proximity of surrounding developments and their influence on fire behavior should be considered. The following provides general guidance for siting a subdivision or development relative to other existing or future developments:

- Avoid construction sites proximate to an existing or future development in a high or very high fire hazard severity zone, where a minimum 30-foot setback to the property line cannot be provided. Where this cannot be avoided, consider integrating design features, such as fuel breaks and increased structural hardening measures, like those described for sites proximate to unmanaged open or wildland space.
- If there will be any hazardous land uses on the site that could potentially exacerbate risk (e.g., storage of combustible materials, fuel storage facilities) and which cannot be restricted, consider providing additional mitigation measures such as larger setbacks and defensible space areas, secondary emergency water supplies and associated emergency power, increasing exterior wall fire resistance rating (e.g., 1-hour to 2-hour).

### **5.3 Housing Density Considerations**

Historically, wildfires have destroyed more homes built at low and medium densities than high densities. In several destructive WUI fires (Camp Fire, 2018 and 2017 Tubbs Fire in Santa Rosa) homes themselves were often the fuel that carried fire to other homes, regardless of the distance between homes.

#### **5.3.1 Parcels**

State law and the County Fire Code both address building separation.

California Fire Safe Regulations (Title 14) provides minimum requirements for parcels in Section 1276.01:

- (a) All parcels shall provide a minimum thirty (30) foot setback for all Buildings from all property lines and/or the center of a Road, except as provided for in subsection (b).
- (b) A reduction in the minimum setback shall be based upon practical reasons, which may include but are not limited to, parcel dimensions or size, topographic limitations, Development density requirements or other Development patterns that promote low-carbon emission outcomes; sensitive habitat; or other site constraints, and shall provide for an alternative method to reduce Structure-to-Structure ignition by incorporating features such as, but not limited to:
  - (1) non-combustible block walls or fences; or
  - (2) non-combustible material extending five (5) feet horizontally from the furthest extent of the Building; or
  - (3) hardscape landscaping; or
  - (4) a reduction of exposed windows on the side of the Structure with a less than thirty (30) foot setback; or
  - (5) the most protective requirements in the California Building Code, California Code of Regulations Title 24, Part 2, Chapter 7A, as required by the Local Jurisdiction.

Section 4907.4.1 of the County Fire Code contains similar general setbacks. It requires buildings and structures to be setback a minimum of 30 feet from property lines and biological open space easements unless existing permitted buildings and structures are located within 30 feet of the property line or the County Zoning Ordinance requires a greater minimum. When the property line abuts a roadway, the setback shall be measured from the centerline of the roadway.

Exception: When both the building official and the FAHJ determine that the hazard from a wildland fire is not significant or when the terrain, parcel size or other constraints on the parcel make the required setback infeasible.

### **5.3.2 Clustered/High Density Communities**

Clustering structures reduces collective exposure as well as expansion into wildfire hazard areas while minimizing the overall number of houses on a site. It also helps limit impacts to environmental services, ecological needs, and recreational goals for open space, while reducing the distribution of firefighting resources during a major wildfire incident.

Combining more compact housing with buffering patches of less-flammable land use (commercial or small-scale agriculture) can also result in synergistic benefits: safe pedestrian and biking infrastructure.

It is important to note that higher densities increase the risk of home-to-home ignitions and necessitates fire-resistant construction, evacuation plans, and safe refuge.

### **5.3.3 Traditional/Lower Density Communities**

Traditional housing developments, with lower density designs, allow each individual home/structure to directly integrate wildfire safety provisions (e.g., structural hardening measures and defensible space) prescribed in wildfire codes and standards for each individual building or home. However, lower-density housing, collectively, requires a higher amount of land area dedicated to defensible space compared to higher-density designs, which can have negative impacts to environmental services and other ecological goals of the community. Lower density developments can also result in the need to disperse firefighting resources and suppression activities in the event of a major wildfire incident, given the larger spread of development.

Another consideration is existing subdivisions or structures on adjacent lots that may not have been designed to meet an equivalent level of safety as required by this document and, therefore, the fire risk they can present to surrounding properties is uncertain. This uncertainty can be mitigated by requiring fire safety measures at the neighborhood level during planning and development specific to subdivisions, such as communal defensible space or high- density vs low-density design options.

**BEST PRACTICE:** Poway sited a higher density subdivision next to an existing lower density subdivision decreasing amounts of flammable vegetation in the development and making defensible space easier to maintain and homes more easily defended with fewer resources in a wildfire.

Best practices also include separation/maximizing defensible space by using non-flammable amenities in design, employing safe setbacks on slopes, concentrating homes on interior side of roadways.



## 5.4 Ignition-Resistant Building Construction

Chapter 7A of the County Building Code and Section R337 of the Residential Code regulates construction in the fire hazard areas of San Diego. The purpose of these code is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas, The Very High Fire Hazard Severity Zones of the Local Responsibility Areas, and/or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses. California Referenced Standards Code, Chapter 12-7A includes testing and labeling requirements for building materials.

Building elements covered include:

- Roof – roof covering, vents, roof edge, and gutters (including gutter covers and drip edge)
- Under-eave area – eaves, soffit, and vents
- Exterior wall – siding, windows, doors, trim, and vents
- Attached deck – horizontal surface area, rails, and under-the-deck footprint
- Accessory Structures

The Society of Fire Protection Engineers (SFPE) and SFPE Foundation published a WUI Virtual Handbook for Property Fire Risk Assessment & Mitigation (3/7/2023) which is an excellent compilation of related resource materials leveraging expertise of the fire service, engineering, and insurance industries: [www.sfpe/wuihandbook/home](http://www.sfpe/wuihandbook/home).

**BEST PRACTICES:** Full-scale fire tests by the Insurance Institute for Business & Home Safety identifies elements of a “Wildfire Ready Home” which are more ignition-resistant than a home constructed to Chapter 7A requirements. The table in Figure 2 summarizes findings from IBHS research published by Headwaters Economics in *Construction Costs for Wildfire-Resistant Home, California Edition* (July 2022).

[https://headwaterseconomics.org/wp-content/uploads/2022\\_HE\\_IBHS\\_WildfireConstruction.pdf](https://headwaterseconomics.org/wp-content/uploads/2022_HE_IBHS_WildfireConstruction.pdf)

Some of the most important differences include:

- Noncombustible near-home zone (0-5’) (adopted by San Diego County)
- Require decks to be enclosed
- Specify dual glazing with *inner* pane tempered

Building materials and components in the Baseline, Enhanced, and Optimum scenarios.

	BASELINE			ENHANCED			OPTIMUM		
	Northern California			Northern California			Northern California		
	Southern California			Southern California			Southern California		
<b>Roof</b>									
Fascia	Wood	Wood	Wood	Wood	Wood	Wood	Fiber-cement	None	
Cutter	Vinyl	Vinyl	Vinyl	Vinyl	Vinyl	Vinyl	Metal with metal gutter guards	Metal with metal gutter guards	
Roof surface	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Steel roof panels, metal drip edge	Clay tiles, noncombustible end caps, metal drip edge	
Underlayment	None	None	None	None	None	None	Synthetic, fire-resistant	Mineral-surfaced roll roofing	
<b>Under-Eave Area</b>									
Soffit	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Fiber-cement	Stucco	
Under-eave vent	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Metal strip vents	Metal strip vents	
<b>Exterior Walls</b>									
Door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Galvanized steel with insulated glass panel; aluminum-framed tempered-insulated-glass sliding door; metal garage door	Galvanized steel with insulated glass panel; aluminum-framed tempered-insulated-glass sliding door; metal garage door	
Dryer vent	Plastic, louvered	Plastic, louvered	Plastic, louvered	Plastic, louvered	Plastic, louvered	Plastic, louvered	Metal	Metal	
Siding	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Fiber-cement lap siding	Stucco	
Trim	Wood composite	Wood composite	Wood composite	Wood composite	Wood composite	Wood composite	Fiber-cement	Stucco	
<b>Attached Deck</b>									
Deck surface	Redwood (non-fire-retardant-treated)	Plastic composite, uncapped	Plastic composite, uncapped	Redwood (non-fire-retardant-treated)	Plastic composite, uncapped	Plastic composite, uncapped	Plastic composite, capped; metal grate at deck-to-wall junction	Metal decking; metal grate at deck-to-wall junction	
Fascia	Redwood	Plastic composite	Plastic composite	Redwood	Plastic composite	Plastic composite	Plastic composite, capped	Metal	
Railing	Redwood	Plastic composite	Plastic composite	Redwood	Plastic composite	Plastic composite	Plastic composite	Metal	
Structural support system	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Foil-faced bitumen tape on top and sides of supporting joists	Metal	
Underdeck area	Not enclosed	Not enclosed	Not enclosed	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	
<b>Near-Home Landscaping</b>									
Fencing and gate	Cedar	Cedar	Cedar	Metal chain-link	Metal chain-link	Metal chain-link	Metal chain-link	Metal chain-link	
Mulch	Bark mulch	Bark mulch	Bark mulch	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	

BEST PRACTICE: NIST, CALFIRE, and IBHS have developed the Hazard Mitigation Methodology (HMM). The goal of HMM is to reduce the vulnerability of structures and parcels in a cost-efficient and implementable way. The HMM was conceived to allow structures in the WUI to “stand alone” and survive fire and ember exposures without contributions from first responders. This was deemed necessary as field data has demonstrated that wildfire progression can quickly outpace the efforts of first responders during large and/or concurrent WUI fires. NIST WUI reconstruction data has also shown the efficient and effective structure protection actions by first responders; very little or no meaningful improvement can be achieved in this area. The emphasis must be shifted to making structures stand alone.

The following list contains information intended to capture the relationships between exposures, parcel and structure hardening, and community structural losses. The relationships are intended to provide relative performances and highlight trends and critical thresholds. Actual conditions, including construction, parcel sizes and fuel loading, structure separation distances, parcel and structure hardening, local weather, ignition sequencing, and defensive actions, will impact actual fire spread and community resilience.

#### ***General Relationships between Exposure and Hardening***

1. Low fire exposures are relatively easy to address by hardening the structure.
2. High fire exposures (direct flame impingement from large sources such as a burning residence) are very difficult to address by hardening the structure. This is because both the cladding (siding and roofing) material and the assembly need to be hardened not only to withstand the exposure but also to withstand it for the entire exposure duration, therefore potentially propagating energy into the assembly past the external cladding component.
3. Fire exposures from a fully involved single family residence will result in fire propagation that will be very difficult to stop in the presence of wind in high density communities.
4. High fire exposures can readily cause direct ignition of exposed combustibles.
5. The ember hardening and structure survivability relationship is not linear. Hardening 80% of the vulnerabilities will not necessarily result in 80 % decrease in structure ignition potential. While the actual values will vary based on local conditions and specifics of hardening, the relationship will apply to almost all scenarios.
6. In situations where a potential fuel source is located near a residential/commercial structure and when fuel reduction, relocation, or removal cannot alleviate severe fire exposures to that structure, hardening the structure for fire may frequently add limited value. In these situations, ignition prevention of the fuel source will be the critical path to reducing the ignition of the residential/commercial structures.

Additional information, including separation distances for accessory structures, is found at: <https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf>

## **5.5 Access, Egress And Evacuation Route Planning**

Both road infrastructure and evacuation planning are key components at the neighborhood- and community-scales in high wildfire prone settings, such that people can evacuate during a major wildfire safely and quickly along primary and secondary routes, and first responders can effectively gain access to conduct emergency operations.

This includes providing a sufficient number, arrangement, and capacity of road networks, as well as meeting specific roadway standards, and understanding the impact of new development on the regional road network.

Developments with inadequate access (e.g., long roads with a single access point, roads over steep grades, improper road surfaces, and/or narrow roads) significantly contribute to the inability to effectively evacuate residents during a disaster (wildfire, earthquake, or flood) and provide necessary emergency access for fire, ambulance, or law enforcement personnel.

Requirements may be modified where topographic conditions, title limitations, or the pattern of ownership or the state of development of parcels in the immediate vicinity of a division of land make the strict application of the provisions of these sections impossible or impractical and that the public health, safety and general welfare will not be adversely affected thereby.

### **5.5.1 Applicable Codes/Regulations**

- *County Consolidated Fire Code*
- *Fire Safe Regulations CCR, Title 14 (Natural Resources), Division 1.5 (Department of Forestry), Chapter 7 (Fire Protection) under Subchapter 2.*
- *County of San Diego Department of Public Works Public & Private Road Standards*

### **5.5.2 Maximum Length of Dead-End Roads**

The intent of limiting the allowable length of a dead-end road is to ensure that firefighters have access flexibility to deal with changing dynamics in wildfires and other emergencies, and that civilians have safe, reliable, and known evacuation alternatives during emergencies.

In part, the concept of dead-end road regulations relates to limiting the number of persons attempting to evacuate on the road and to limit the time needed for safe evacuation. Steep, narrow, and winding roads delay evacuation. Long dead-end roads in rural wildland areas place people and emergency personnel at increased risk. The following general standards apply to projects that utilize dead-end roads:

- Road length is measured from the beginning of the primary access road at a point where one can evacuate in two different directions (which may be off-site), measured to the end of the most remote cul-de-sac. Refer to Figure 3 for guidance on measuring dead-end road length.
- Projects with an access road that exceeds the regulations for dead-end roads should first consider providing an alternate means of access and egress before resorting to other possible alternatives.
- An important factor in evaluating existing and proposed access roads is road connectivity. When feasible, projects should extend on-site roads to the edge of the property for possible future connectivity.
- To ensure that necessary access to the project site remains available in perpetuity, the applicant needs to provide evidence that a permanent and reliable right of access has been obtained. These rights would generally be in the form of an easement that runs with the land.
- Access may be proposed over tribal lands held in trust only if the Tribe waives its sovereign immunity and allows the Tribe to be sued in state court to enforce the right of access over the tribal lands. The requirement to waive sovereign immunity does not apply if the Bureau of Indian Affairs grants the access rights.

- Security (privacy) gates or other types of barricades are generally discouraged as they can obstruct civilian egress and responder ingress during a fire emergency. However, in certain circumstances, gates can be allowed if they provide a rapid and reliable means of firefighter ingress and unobstructed egress for civilian evacuation as determined by the FAHJ. For example, entry gates positioned at the entrance to a subdivision must provide for rapid entry by emergency responders. The rapid opening of the gate for responders may be activated by personnel stationed at the gate on a 24-hour basis, emergency vehicle traffic signal pre-emption strobe detectors, close proximity public safety radio transmissions, battery back-up with "lock open" on power failure, or key-operated electric override switch. In all cases, exiting from the subdivision through the gated entry should be unobstructed and not require any activation measures unless the FAHJ assumes responsibility to activate the gate during times of emergency. All gates must comply with County Consolidated Fire Code.

**BEST PRACTICE:** Los Angeles County's subdivision regulations were revised after the Woolsey Fire to limit the number of lots that can be located on a single point of access:

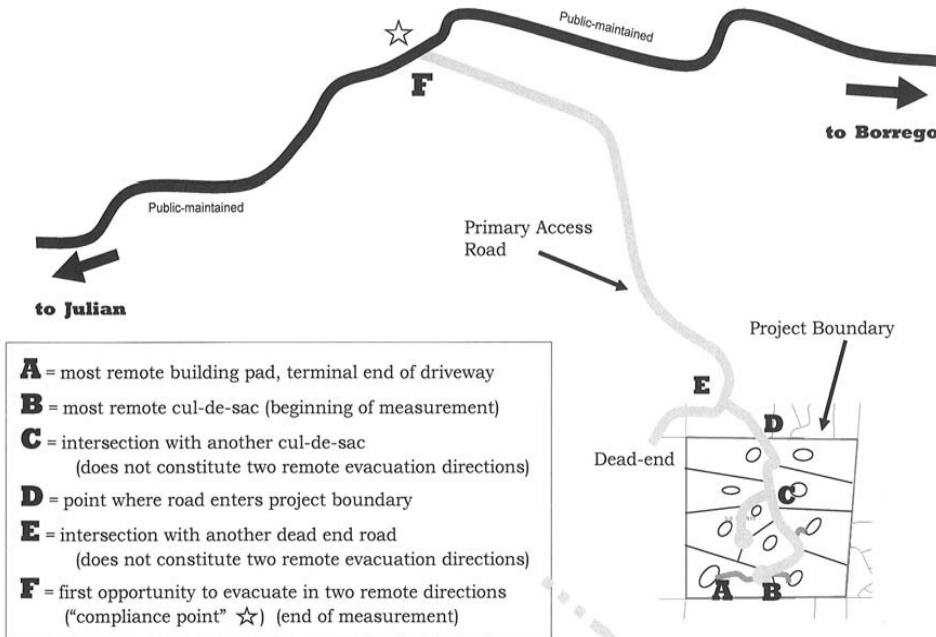
If a street or street system is restricted to a single route of access to a road shown on the Roads Plan, except for a limited secondary highway, which is maintained and open to public travel, whether at the point of intersection with the highway or at some point distant from the highway, the street or street system shall serve not more than:

- 150 dwelling units where the restriction is designed to be permanent and the street or street system does not traverse a wildland area which is subject to hazard from brush or forest fire;
- 75 dwelling units where the restriction is designed to be permanent and the street or street system traverses a wildland area which is subject to hazard from brush or forest fire;
- 300 dwelling units, where the restriction is subject to removal through future development.

If the roadway paving on that portion of the street or street system forming the restriction is less than 36 feet in width and is not to be widened to 36 feet or more as a part of the development of the division of land, the permitted number of dwelling units shall be reduced by 25 percent if the pavement is 28 feet or more in width, and by 50 percent if the pavement is less than 28 feet in width. If the roadway paving on that portion of the street or street system forming the restriction is 64 feet or more in width and the restriction is subject to removal through future development, the permitted number of dwelling units may be increased to 600. In no event shall the pavement width be less than 20 feet.

### FIGURE 3: Measuring Length of Dead-End Roadways

Guidance for Determining Primary Access Road Length

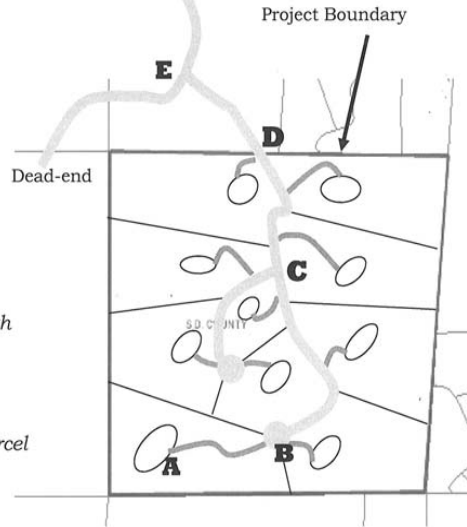


Road length for maximum dead-end distance (threshold for additional access requirement) is measured from the most remote cul-de-sac... **point B**

...along the primary access road to a point (which may be off-site) where one can evacuate the area in two different remote directions (the compliance point). ☆ **point F**

The maximum allowable dead-end road length is determined by the zoning of the parcels served by that road, including off-site.

Where a dead-end road (on and off-site) crosses areas of differing zoned minimum parcel sizes subject to different length standards, the shortest standard shall apply.



### **5.5.3 Fire Access Road Width**

The minimum width identified in the codes should not be obstructed at any time. Parking should be outside the required fire access road width. The exception allowance under the code is often considered for reductions in width for a short section where extreme topographic constraints make it impossible to obtain the minimum required width or where impacts to sensitive biological resources can be avoided. Any exception allowance under the code shall be replaced with an alternative measure that provides the same practical effect. This finding should be supported by the Director of Public Works, the FAHJ and the County Fire Marshal based on extreme topographic or biological constraints.

### **5.5.4 Fire Access Grade**

Full compliance with the code is required. Exceptions would be considered where full compliance with the standard could not be achieved because of extremely steep terrain. Any exception allowance under the code shall be replaced with an alternative measure that provides the same practical effect.

### **5.5.5 Fire Access Surface Type**

Full compliance with the code is required.

## **5.6 Water Supply**

Providing adequate water supply, volume, and pressure, is crucial in fighting not only wildland fires, but smaller scale residential fires as well. History has shown that most fire related responses are to residential fires. In some cases, however, residential fires escape the confines of the house and become wildfires. As such, it is important that water resources are adequate to meet the volume and flow needs to properly fight fires either at an individual home or the surrounding neighborhood. A municipal water supply (waterlines and hydrants) is always preferable to on-site tanks.

### **5.6.1 Inside Water District**

Full compliance with the code. For water main extensions, the measurement of distance to the water main should be taken from the existing main to the nearest portion of the subject parcel (to the property line), not to the proposed hydrant location.

### **5.6.2 Outside Water District**



Full compliance with the code. Structures or clusters of structures substantially greater than roughly 5,000 square feet should provide additional water storage to increase fire suppression capacity.

When a water supply for structure defense is required to be installed, such protection should be installed and made serviceable prior to and during the time of construction.

Standardize and document as with municipal supply systems to ensure they are filled, maintained, and periodically tested. NFPA 1142, "Standard on Water Supplies for Suburban and Rural Fire Fighting," provides guidance.

**BEST PRACTICE:** San Diego County Water Tank Standard

Mendocino County Fire Safe Council also has an excellent 4-page pamphlet

## **5.7 Subdivision Landscaping and Vegetation Management**

In April 2023, the Board of Supervisors adopted an ordinance moving the requirements of the County's Defensible Space Ordinance to the County Consolidated Fire Code to improve efficiency and clarity.

Specific planting requirements from the County Fire Code include:

- Shrubs limited to 6' in height.
- Grouping of shrubs limited to a maximum aggregate diameter of 10'.
- Separation of shrub groupings of a least 15'.
- Separation of groupings from structure of at least 30'.
- Shrubs located below or within a tree drip line shall be a separated from the lowest tree branch by a minimum of three times the height of the understory shrubs or 10 feet, whichever is greater.
- Tree driplines must be maintained at not less than 10 feet from any combustible structure.
- The horizontal distance between tree crowns must be not less than 10 feet.

In addition, the State Minimum Fire Safe Regulations, Title 14, requires fuel breaks. These may be synonymous with community "fuel modification" zones, based on application. Specifically, Section 1276.03 states:

- (a) When Building construction meets the following criteria, the Local Jurisdiction shall determine the need and location for Fuel Breaks in consultation with the Fire Authority:

- (1) the permitting or approval of three (3) or more new parcels, excluding lot line adjustments as specified in Government Code (GC) section 66412(d); or
  - (2) an application for a change of zoning increasing zoning intensity or density; or
  - (3) an application for a change in use permit increasing use intensity or density.
- (b) Fuel Breaks required by the Local Jurisdiction, in consultation with the Fire Authority, shall be located, designed, and maintained in a condition that reduces the potential of damaging radiant and convective heat or ember exposure to Access routes, Buildings, or infrastructure within the Development.
- (c) Fuel Breaks shall have, at a minimum, one point of entry for fire fighters and any Fire Apparatus. The specific number of entry points and entry requirements shall be determined by the Local Jurisdiction, in consultation with the Fire Authority.
- (d) Fuel Breaks may be required at locations such as, but not limited to:
- (1) Directly adjacent to defensible space to reduce radiant and convective heat exposure, ember impacts, or support fire suppression tactics;
  - (2) Directly adjacent to Roads to manage radiant and convective heat exposure or ember impacts, increase evacuation safety, or support fire suppression tactics;
  - (3) Directly adjacent to a Hazardous Land Use to limit the spread of fire from such uses, reduce radiant and convective heat exposure, or support fire suppression tactics;
  - (4) Strategically located along Ridgelines, in Greenbelts, or other locations to reduce radiant and convective heat exposure, ember impacts, or support community level fire suppression tactics.
- (e) Fuel Breaks shall be completed prior to the commencement of any permitted construction.
- (f) Fuel Breaks shall be constructed using the most ecologically and site appropriate treatment option, such as, but not limited to, prescribed burning, manual treatment, mechanical treatment, prescribed herbivory, and targeted ground application of herbicides.
- (g) Where a Local Jurisdiction requires Fuel Breaks, maintenance mechanisms shall be established to ensure the fire behavior objectives and thresholds are maintained over time.
- (h) The mechanisms required shall be binding upon the property for which the Fuel Break is established, shall ensure adequate maintenance levels, and may include written legal agreements; permanent fees, taxes, or assessments; assessments through a homeowners' association; or other funding mechanisms.

The intent is to ensure all flammable vegetation or other combustible growth is managed to reduce the threat from wildfires. Reports on destructive fires contain common problem areas near structures, including:

- Overgrown or unmanaged vegetation
- Combustible mulches
- Woodpiles
- Trash and recycling receptacle storage locations
- Hazardous plants and vegetative debris
- Clustering of trees and shrubs

### 5.7.1 Guidelines for Subdivision Landscaping and Vegetation Management

In addition to the County Fire Code and Title 14, maintenance requirements and suggestions for landscaping within fuel modification and defensible space areas are provided in:

- “California Vegetation Treatment Program” (<https://bof.fire.ca.gov/projects-and-programs/calvtp/>)
- “Fire, Defensible Space and You...” ([http://sdcounty.ca.gov/dplu/fire\\_resistant.html](http://sdcounty.ca.gov/dplu/fire_resistant.html));
- “Fire-safe Landscaping Can Save your Home” (<http://www.sdcounty.ca.gov/oes/docs/fswy12.pdf>);
- The California Native Plant Society’s “Native Plant Landscaping to Reduce Wildfire Risk” (<http://www.cnpsd.org/fire/ReduceFireRisk.pdf>).
- “Ready, Set, Go” (<http://www.readyforwildfire.org/>)

There are generally three levels of vegetation management:

1. Community Fuel Modification (FM)
2. Defensible Space around Structures (DS)
3. Ornamental Landscaping outside FM and DS

Any project that is required to prepare and implement a full FPP may also be required to prepare a **Fire Behavior Model** that evaluates a worst-case scenario wildfire based on site topography, weather and vegetation. The modeling, combined with the consultant/fire authority’s expertise may result in the consultant proposing greater or lesser buffers to minimize building and occupant safety risks.

If required, landscape plans shall be provided to the FAHJ or a designated third party for any new construction and or addition for residential and commercial buildings or accessory thereof. Plans shall be submitted and approved prior to any framing inspection. In addition, plans shall be provided when modifications occur to any previously approved landscape plan or to the Home Ignition Zones.

Plans shall be prepared by a California Licensed Landscape Architect, Architect, or Civil Engineer. A landscape designer could prepare planting plans only (not irrigation) for a single-family residence but would need one of the above professionals to stamp the plans verifying compliance with the regulations. Plans shall include:

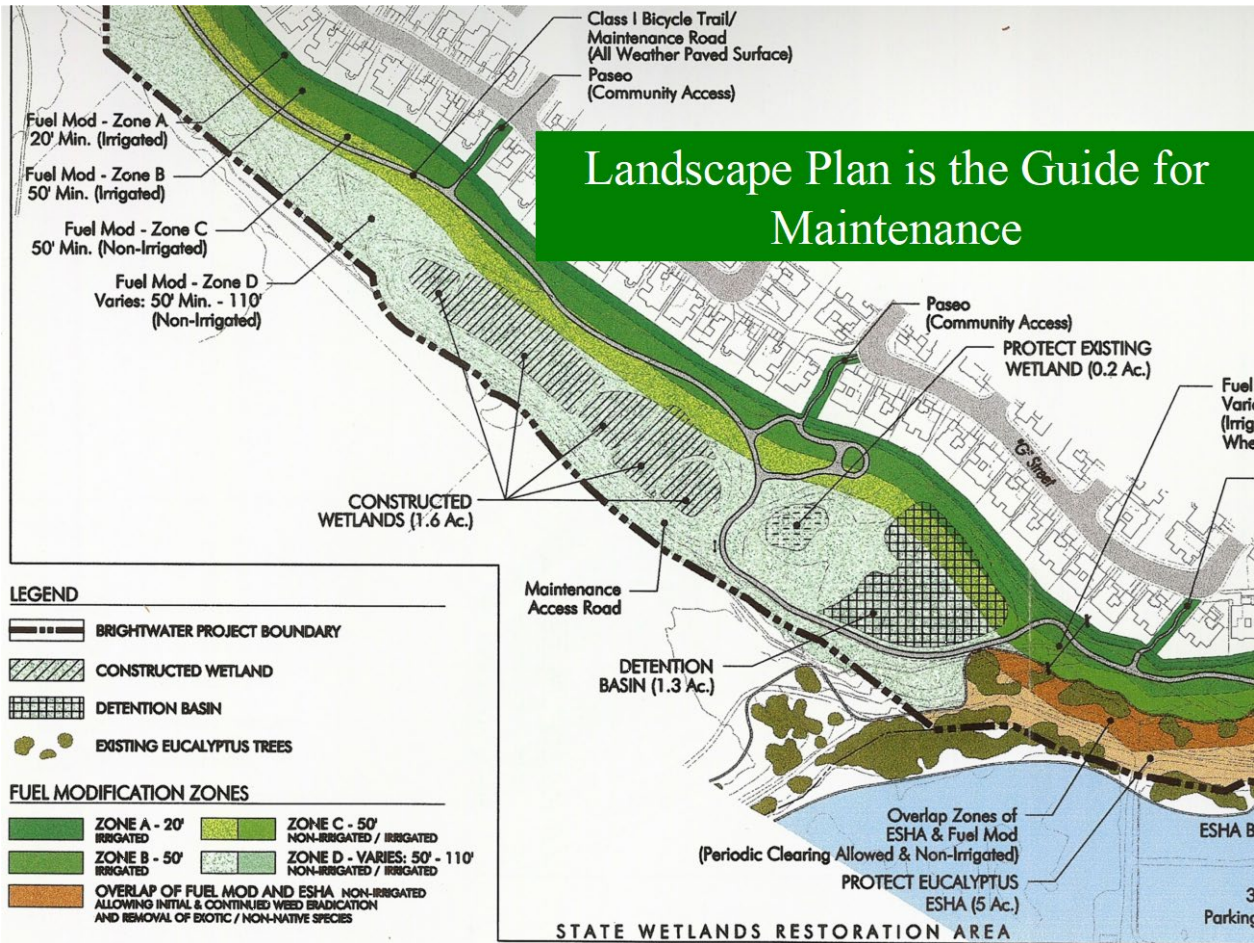
1. A readable (Engineer or Architect) scale.
2. Delineation of Fuel Modification Zones and Defensible Space/Home Ignition Zones with a general description of zone dimensions and character.
3. Describe and show existing vegetation on plan.
4. Include a Plant Legend with the plant-life form, scientific and common name, and expected height and width for mature growth.
5. Describe vegetation reduction around emergency access and evacuation routes.
6. Include quantities of trees and large shrubs being proposed.
7. Identify irrigated and non-irrigated areas on the plan.
8. Identify points of access for equipment and personnel to maintain vegetation.
9. Define all symbols, site amenities, features, and shaded areas, etc. used on the plans.
10. Legally binding statements regarding community responsibility for fuel modification zones
11. Legally binding statements to be included in covenants, conditions, and restriction regarding property owner's responsibilities for vegetation maintenance.

### **5.7.2 Community Fuel Modification**

Community level fuel modification should be required as a condition of issuing a construction permit (preliminary) and certificate of occupancy (final) for permitting or approval of three or more parcels (Title 14, Section 1276.03, pg. 56). Fuel modification zones should be designed to protect a new community by reducing the fuel loads adjacent to a community and buildings within it. (Figure 4). The developer shall assign the land on which any fuel modification zone is established to the association or other common owner group that succeeds the developer as the person responsible for common areas within the community.

Once a fuel modification zone has been established, the land on which the zone is located shall be under the control of an association or other common ownership established in perpetuity, for the benefit of the community to be protected.

**FIGURE 4: Sample of a Community Fuel Modification Plan**



**BEST PRACTICE:** The Orange County Fire Authority has been requiring 170' of fuel modification around all new developments since the late 1970's. Three of the four zones are 50' in width (measured through air rather than along ground) and require various vegetation management strategies related to plant type, spacing, irrigation, etc. Maintained by the homeowner association, it has proven successful in protecting many neighborhoods from wildfire.

### 5.7.3 Defensible Space for Structures (See Figures 5 and 6)

The County Fire Code requires defensible space around every building that is designed primarily for human habitation or use, or a building designed specifically to house farm animals. Decks, sheds, gazebos, freestanding open-sided shade covers and similar accessory structures less than 250 square feet and 50 feet or more from a dwelling, and fences more than 5 feet from a dwelling, are not considered structures for the establishment of a fuel modification zone. Defensible space shall comply with the following:

- a. When a building or structure in a hazardous fire area is located 100 feet or more from the property line, the person owning or occupying the building or structure shall maintain defensible space within 100 feet of the building or structure.
- b. The fire code official may increase the defensible space more than the 100-foot minimum if fuel and/or topography are determined to increase the fire hazard severity.
- c. When a building or structure in a hazardous fire area is setback less than 100 feet from the property line, the person owning or occupying the building or structure shall meet the requirements in subsection (a) above, to the extent possible, in the area between the building or structure and the property line.
- d. The building official and the FAHJ may provide lists of prohibited and recommended plants.
- e. A Structures defensible space shall be located entirely on the subject property unless approved by the FAHJ. This required defensible space may be reduced as allowed in subsection (c) above or increased as required by a fire protection plan.
- f. When the subject property contains an area designated to protect biological or other sensitive habitat or resource, no building or other structure requiring a defensible space shall be located to extend the defensible space into a protected area. Improved Property: Property owners shall be permitted to clear all combustible vegetation within a one hundred (100) foot radius of all buildings and structures using methods, such as mowing and trimming that leave plant root structure intact to stabilize soil. Clearing is not limited to these methods and discing, which exposes bare mineral soil, may be used if deemed necessary by the FAHJ.
- g. Where the distance from the structure to the property line of the parcel on which the building is located is less than the distance required to be cleared, (100'), the adjacent parcel owner may be required to establish the required fuel break to achieve the required distance of defensible space if such requirement is approved by the Fire Code Official.

Maintenance of defensible space is required by the owner or occupant.

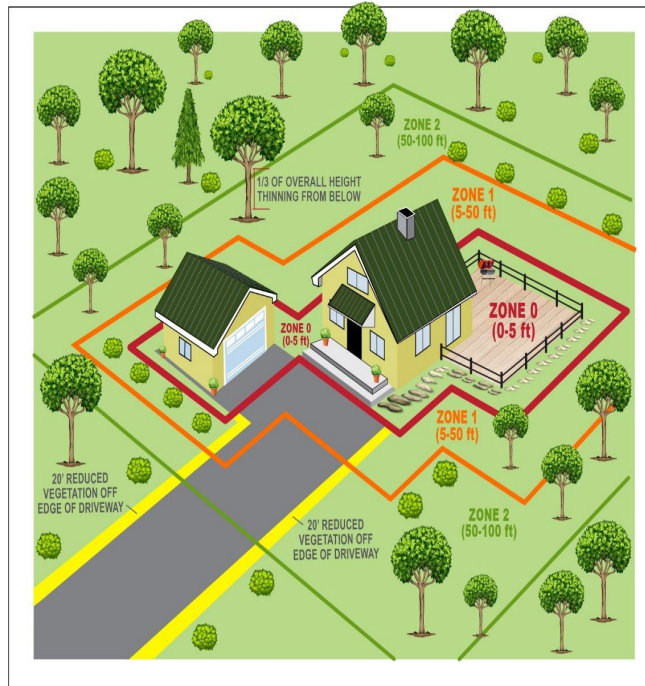
**BEST PRACTICE:** San Diego County adopted Home Ignition Zones within their County Fire Code, in accordance with full-scale fire testing identifying the critical need as part of a “hardened home”.

**Zone 0 “Immediate Zone” 0-5’** Measured from the exterior wall surface or patio, deck, or attachment to building or structure extending 5 feet on a horizontal plane. This zone shall be constructed of continuous hardscape or non-combustible materials.

**Zone 1 “Intermediate Zone” from Zone 0 to 50’** measured from the immediate edge of Zone 0 extending out in a horizontal plane. This zone shall consist of planting of low growth, drought tolerant and fire resistive plant species. The height of the plants in this zone starts at 6” adjacent to Zone 0 and extending in a linear fashion up to a maximum of 18” at intersection with Zone 2.

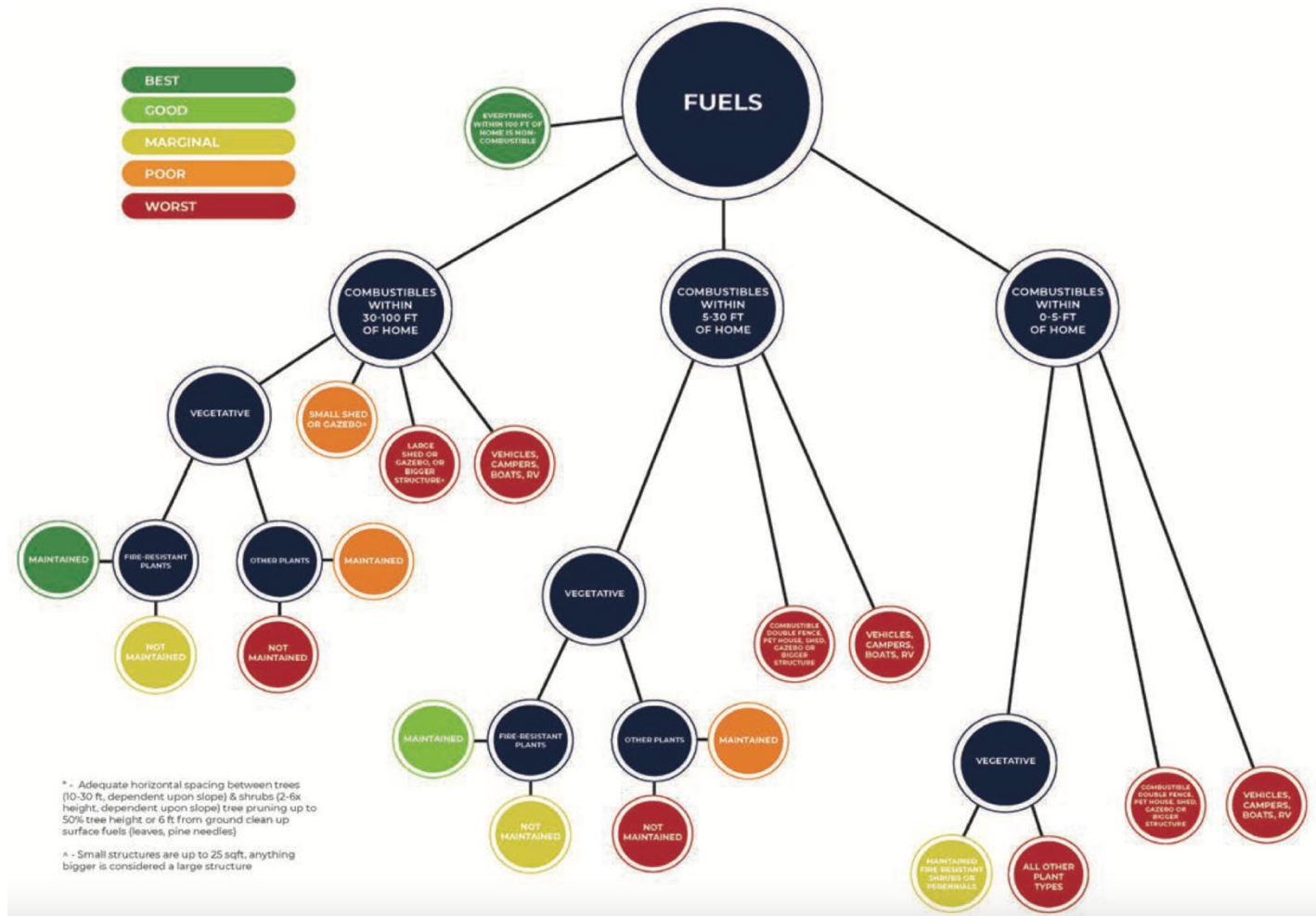
**Zone 2 “Extended Zone” from Zone 1 to 100’** measured from the immediate edge of Zone 1 extending out in a horizontal plane for 50’. This zone consists of planting of drought tolerant and fire resistive plant species of moderate height. This area would be considered selective clearing of natural vegetation and dense chaparral by removing a minimum 50% of the square footage of this area.

**FIGURE 5: Defensible Space Zones**





**FIGURE 6: Defensible Space Guidance for Fuels**



### 5.7.4 Roadways

The FAHJ may require a property owner to modify combustible vegetation in the area within 20 feet from each side of the driveway or a public or private road adjacent to the property to establish a fuel modification zone.

### 5.7.5 Open Spaces

Natural and man-made land use features (i.e., mostly unmanaged, or minimally maintained vegetation in various open spaces, drainage ditches, etc.) amplified not only the intensity and behavior of the wildfire, but also the associated impacts to the surrounding communities. Conversely, where vegetation was well maintained (e.g., irrigated, mowed, trimmed back) fire intensity, spread, and associated damage were reduced.



Most of the observed open spaces, drainage ditches, greenbelts, and recreational spaces adjacent to, intermixed or interwoven with the rural and urban/suburban communities in the impacted areas of the Marshall Fire (Colorado, 2021) did not appear to have a long-term, wildfire-specific land resource management strategy. Such a strategy would help prevent, mitigate and/or manage vegetative fuel loads, particularly high hazard vegetation, adjacent to suburban/urban development.

Creating a long-term, wildfire-specific land resource management strategy may be a challenge due to the diverse set of stakeholders and jurisdictions responsible for managing these public and private land use spaces such as municipal parks, open spaces, conservation areas, and jointly managed county/city open space. Limited resources, limited wildfire-specific land use management and/or multi-hazard codes, and standards and guidance documents, etc. may also present challenges.

Place open spaces within the development site with consideration to underlying wildfire hazard and risk. This may include designating areas of high wildfire hazard as permanently conserved open spaces (with ongoing fuel reduction treatments), thereby reducing the introduction of people and property in higher-hazard areas. An added benefit of this technique may be conserving useful habitat for native plants and animals.

Consider the different types of open space which may exist or be built within the development. Small, landscaped, and manicured open spaces have a lower risk profile than large spaces with non-native, and possibly more flammable, vegetation. Surround larger spaces with defensible space and plan for them to burn periodically. The outside perimeter of a development is a good place to locate walkways and trails, to reduce fuel loading adjacent to structures.

Common open spaces (parks, play areas, undeveloped lots, road medians, trails) need to be planned with fire-adaptive landscape design features. In addition to initial design and planning, long-term maintenance plans must be designed and implemented. The placement of open spaces within a development, specific types of plants to use and avoid, and ongoing maintenance are all important planning elements. Consider placement of vegetation within each open space. Recommended separation distances will vary by community and vegetation type. Reference recommendations and requirements for tree spacing based on the slope and location of the property.

BEST PRACTICE: Use of nonflammable amenities in the layout of a subdivision to maximize defensible space. Amenities are placed in a way that they ring the subdivision as part of a larger defensible-space strategy.

- Golf course placement around a development near Arcilla limits home exposure to wildfire.
- Small orchards near Escondido provide a partial barrier for some homes.
- The Orchard Hills development in Irvine uses an avocado orchard as part of an agricultural-urban interface protecting the development.

### **5.7.6 Ornamental Landscaping and Plants**

Specific plant types should be selected based on fire-resistance. Also be aware of plants to avoid. Invasive plants can have a higher potential for ignition than native vegetation because they often produce more flashy fuels which ignite and burn quickly. However, native vegetation can also be highly flammable. Common characteristics of prohibited plants include volatile resins and oils, generally aromatic when crushed (e.g., eucalyptus), narrow leaves or long, thin needles, waxy or fuzzy leave, accumulates dead leave and twigs on and/or under the plant (e.g., Italian Cypress), loose or papery bark, invasive species.

All new vegetation shall be *drought tolerant* and fire-resistant vegetation in accordance with the County Fire Code which also has height and spacing requirements for shrubs and trees. Characteristics of “fire-adapted” plants include: Drought-resistant, pest-resistant, native to area, noninvasive, slow-growing, wind-resistant, sustainable without supplemental fertilization.

All ornamental landscaping must also be consistent with County’s Landscape Ordinance and Landscape Design Manual. Projects requiring landscape plans should clearly identify the type of plant materials, locations and spacing of plant materials, and irrigated and non-irrigated landscaping. The landscape consultant may recommend in the text the inclusion or exclusion of specific varieties for review by the County landscape architect.

In addition to initial vegetation and landscape planning, ongoing vegetation management and maintenance is crucial. This includes all areas with vegetation in the development—both heavily landscaped open spaces and those dominated by native vegetation. Regular fire mitigation over the long-term should be required or performed.

**Revise to BEST PRACTICE:** Non-fire-resistant vegetation. New trees not classified as fire resistant vegetation, such as conifers (*including Junipers and Cypress*), palms *with fibrous tissues*, pepper trees, *acacia species*, *bamboo species* and eucalyptus species, and other species deemed highly flammable are currently permitted provided the tree is planted and maintained so that the tree's drip line at maturity is a minimum 30 feet from any combustible structure. **Consider prohibiting these species in FHZs.**

## **5.8 Protection Of Critical Infrastructure**

Critical infrastructure protection (access/egress routes, communication systems, water supplies/infrastructure, electrical power infrastructure) from wildfire hazards, as well as limiting the potential sources of wildfire ignitions due to some of these features, is an important planning consideration where relevant to a new development or subdivision.

Critical infrastructure may span across multiple jurisdictions and may have multiple responsible entities (e.g., public utilities, city, county). Coordinate with all responsible parties. Infrastructure should be inventoried and assessed to determine vulnerability. Mitigation strategies, such as the removal of hazardous vegetation, may be part of an existing CWPP or HMP. If a critical infrastructure plan exists separately, planners should seek connections between these plans. Consider hiring a fire protection engineer or wildfire safety specialist to evaluate and recommend wildfire safety provisions, protection measures, etc.

### **5.8.1 Electrical**

Where possible, place all electrical distribution equipment in conduit underground. Where underground distribution equipment is infeasible, consult any relevant fire safety ordinances for adequately designing overhead electrical distribution lines and associated equipment (e.g., transformers) to reduce the likelihood of this equipment providing a source for wildfire ignitions. Consideration should be given not only to the hardening of the equipment, but also in providing adequate vegetation clearance, appropriate plant selection such that fall-in, grown-in and lean-in of vegetation is minimized, and long-term management.

### **5.8.2 Fuel**

Fuel tanks (e.g., propane) can present a significant hazard to both structures and first responders if they start off-gassing or explode during a wildfire. Exposed, fuel lines can also be vulnerable to wildfire damage (see NFPA 58). Bury or shield fuel lines to protect them from the effects of radiation, direct flaming, and ember exposure. Bury pressurized fuel-storage vessels underground, where possible. Where fuel storage tanks are stored or installed above ground, the following guidance should be considered:

- Install tanks a minimum of 30 feet from habitable structures.

- For cylindrical tanks, use vertical tank or orient horizontal tanks so that the circular ends are pointed away from residences or structures since the ends are weaker than the tank body.
- Install tanks on and surrounded by noncombustible surface.
- Provide a noncombustible masonry wall enclosure, where possible
- Avoid installing tanks near high-risk topographic features (e.g., steep slopes, drainages)
- Maintain at least 10 feet of clearance from other combustibles.
- Avoid installing tanks in proximity to primary or secondary egress routes.
- Ensure pressurized storage tanks have a pressure-relief valve and that the valve/vent is directed away from residences and structures.
- Provide signage or other form of notification of type and location of fuel-related utilities, where concealed or inconspicuous.
- Critical fire-protection equipment (e.g., water tanks, water supply pumps, pump houses) may necessitate fire-hazard reduction measures to protect this infrastructure from being damaged or lost during a wildfire incident.

### **5.8.3 Communication Towers & Renewable Energy Installation**

Consider providing 30 feet of hardscaping or brush clearance around communication towers and associated equipment. Consult with local fire authorities for any local requirements, guidance, and best practices. Where no local guidance is provided, consult NFPA 1, NFPA 1140 or IWUIC.

NFPA 1 recommends a noncombustible base and clear area of 10' around ground-mounted photovoltaic installations.

### **5.8.4 Water**

Water supply and water storage, including on-site storage, are components of critical infrastructure within a development.

The reliability of water storage and pumping facilities must be protected from wildfire. At a minimum, 30 feet of brush clearance should be maintained around critical fire protection equipment.

### **5.8.5 Essential Facilities/Community Refuges**

Construct fire-resistant public facilities and create community refuges to provide safety for vulnerable populations and last-resort options for worst-case scenarios. Schools, nursing homes, hospitals on interior and ignition resistant. Different than “safety zones” which are typically large open areas sized based on vegetation height, slope steepness, and winds.

BEST PRACTICE:

- Australia: Design and Construction of Community Bushfire Refuges Handbook.
- Mendocino County Fire Safe Council: Creating a Safety Zone for Wildfire Emergency

### **5.9 Emergency Services**

Fire protection and emergency services are among the most vital and basic of community needs. Firefighters, who are generally the first responders to disasters, must be prepared to respond quickly and effectively to all types of emergencies, including wildland fires. For this reason, the provision of adequate facilities for fire protection and emergency services is fundamental to protecting the health, safety, and general welfare of the residents of San Diego County.

Projects must comply with the emergency travel time requirements specified in the *County General Plan* (Figure 7). Travel time is defined as the estimated time it will take for a responding agency to reach the furthest structure in a proposed development project. Travel time is determined by measuring the safest, most direct, appropriate, and reliable route between the fire station and the project with consideration given to safe operating speeds for heavy fire apparatus. Travel time does not include reflex or reaction time, or on-scene size-up and set-up prior to attacking the fire, all of which are critical precursors to actual firefighting. Travel time may be calculated by using NFPA 1142 Table C.11(b), SANDAG layering, PDS-GIS software travel time mapping, actual emergency travel time run data or actual driving tests. If the travel time determined in the FPP is less than the travel time determined by the FAHJ, the travel time determined by the FAHJ shall take precedence.

NOTE: Stations that are seasonal (not open all year) or staffed with volunteers without legal responsibility to respond to emergencies, should not be used for determining consistency with travel time requirements of the County General Plan.

Where projects exceed these time requirements, the Director of PDS may, upon concurrence with the FAHJ, accept mitigation measures. Acceptable mitigation may include, but is not limited to:

- Alternative construction methods and measures not otherwise required;
- Extending fuel modification and defensible space zones;
- Increased roadway widths;
- Reduced fire hydrant spacing;
- Automatic Aid agreement(s);
- Upgrading existing facilities or infrastructure, including undergrounding of utilities;
- Constructing new facilities; or
- Implementing a long-term binding agreement aimed at reducing the response time to acceptable limits.
- See 5.10.1 below for additional alternatives

Proposed mitigation should be implemented prior to implementation of the discretionary permit (prior to recordation of the final map for subdivisions and prior to issuance of building permits or use and reliance for use permits/site plans).

If a modification is proposed, the requirements of the County Consolidated Fire Code specific to modifications apply. Documentation of mitigation should appear not only in the FPP, but also in the files of the FAHJ as prescribed in the Fire Code. See 5.10.2 below.

**Figure 7: \*Travel Time Standards from the Closest Fire Station**

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> <li>■ Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1)</li> <li>■ Commercial and Industrial Designations in the Village Regional Category</li> <li>■ Development located within a Village Boundary</li> </ul>	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	<ul style="list-style-type: none"> <li>■ Semi-Rural Residential Areas (&gt; SR-1 and SR-2 and SR-4)</li> <li>■ Commercial and Industrial Designations in the Semi-Rural Regional Category</li> <li>■ Development located within a Rural Village Boundary</li> </ul>	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	<ul style="list-style-type: none"> <li>■ Limited Semi-Rural Residential areas (&gt;SR-4, SR-10) and Rural Lands (RL-20)</li> <li>■ All Commercial and Industrial Designations in the Rural Lands Regional Category</li> </ul>	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.

<p><b>&gt;20 min</b></p>	<ul style="list-style-type: none"> <li>■ Very-low rural land densities (RL-40 and RL-80)</li> </ul>	<p>Application of very-low rural densities mitigates the risk associated with wildfires by drastically reducing the number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.</p>
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- \* The most restrictive standard will apply when the density, regional category and/or village/rural village boundary do not yield a consistent response time standard.
- \*\* Travel time standards do not guarantee a specific level of service or response time from fire and emergency services. Level of service is determined by the funding and resources available to the responding entity.

## **5.10 Alternatives To The Standards**

Due to unique site characteristics, there may also be combinations of site/project improvements and opportunities that make adequate mitigation achievable when standards cannot be met. The standards listed below are considered a “starting point”. Nothing in these standards precludes a FAHJ and/or the County from identifying other measures that would adequately mitigate unique site characteristics/conditions. Any exceptions under the code shall be replaced with an alternative measure that provides the same practical effect.

### **5.10.1 Emergency Response-related Standards**

- The type and number of fire apparatus available to serve the project are reliable, well-staffed and redundant. Examples include multiple engines with full-time career or reserve staff, with travel times approximating the “first-in” engine.
- Adequate funding is legally committed in perpetuity to the fire authority for staffing inspections, enforcement and educational programs.
- Adequate road widening and improved road surfacing that generally improves the access to the subject property and surrounding uses.
- The project is supported with a public water system with fire hydrants along access roads at reduced distances and with at least a fire flow of 2,500 gallons per minute.
- Security (privacy) gates or other types of barricades are generally discouraged as they can obstruct civilian egress and responder ingress during a fire emergency. However, in certain circumstances, gates can be allowed if they provide a rapid and reliable means of firefighter ingress and unobstructed egress for civilian evacuation as determined by the FAHJ. Refer to section 5.2.1.2 of these guidelines.
- The project provides funding in perpetuity to support adequate fire agency staffing for fire suppression, fire code enforcement and community safety education. An example would be the establishment of a Community Facilities District to assist in the long-term funding of fire district operations and management.

### **5.10.2 Community Adaptation-related Standard**

- The project is in a developed area or an area with long-standing agricultural operations.
- Adequate Fuel Modification separates the project and open space/wildland areas, including vegetation with low probability of ignition, rapid spread, or high intensity around project access points.
- Siting configurations meet the most recent scientific findings for fire spread.
- Construction standards meet the most recent scientific findings for ignition resistance (see table in Figure 2)



- Limit the number of lots that can be located on a single point of access.
  - 150 dwelling units where the restriction is designed to be permanent and the street or street system does not traverse a wildland area which is subject to hazard from brush or forest fire;
  - 75 dwelling units where the restriction is designed to be permanent and the street or street system traverses a wildland area which is subject to hazard from brush or forest fire;
  - 300 dwelling units, where the restriction is subject to removal through future development.

If the roadway paving on that portion of the street or street system forming the restriction is less than 36 feet in width and is not to be widened to 36 feet or more as a part of the development of the division of land, the permitted number of dwelling units shall be reduced by 25 percent if the pavement is 28 feet or more in width, and by 50 percent if the pavement is less than 28 feet in width. If the roadway paving on that portion of the street or street system forming the restriction is 64 feet or more in width and the restriction is subject to removal through future development, the permitted number of dwelling units may be increased to 600. In no event shall the pavement width be less than 20 feet.

### **5.10.3 Required Findings for Alternatives to Standards**

Certain site-specific situations may make the strict adherence to the County Consolidated Fire Code either impracticable or infeasible. If a modification is proposed, the requirements of the County Consolidated Fire Code specific to modifications apply. The fire code official is authorized to approve a modification to the fire code requirements when the proposed modification is supported by the following “findings”:

- Special circumstances make the strict letter of the code impracticable;
- The modification is in compliance with the intent and purpose of the code, and provides the same practical effect;
- Such modification does not lessen health, life, and fire safety standards;
- Specific section(s) for which a modification is requested;
- Material facts supporting the need for a modification;
- Details of the modification or mitigating measure proposed, and if applicable, a map showing the proposed location of the modification or mitigation measures;
- The modification is documented in the FPP and separated provided to the FAHJ.

#### **5.10.4 Scenarios where Acceptable Alternatives are Unlikely:**

Alternate measures that do not exceed the level of safety provided by the requirements of the adopted plans, codes, and regulations, will not be approved. There also may be situations where a combination of site conditions/constraints, such as those listed below, are so severe that it is unlikely that sufficient mitigation could be provided. In such scenarios, projects may result in a significant impact:

- Project site is surrounded by large wildland areas with little existing or planned surrounding development.
- The primary access road is substandard with no proposal to adequately/reasonably improve it.
- Project site is surrounded by steep slopes and significant topographical constraints that could intensify fire behavior or limit fire suppression operational flexibility.
- Legal access rights have not been obtained for the primary access road and any necessary secondary access road.
- Fire stations available to serve the project site are located substantial distances from the project site such that response by multiple units is significantly delayed.
- The available water supply for fire suppression is limited to tanks, pools or ponds that have limited capacity and require pumping operations.

### **5.11 Plan Acceptance Process**

FPP preparers should work with the local FAHJ. Once the plan is prepared and submitted to the local fire agency, it will be reviewed for compliance with all applicable ordinances and regulations. If practical difficulties in achieving compliance have been identified and modifications or alternate methods are proposed, they must also be evaluated by the FAHJ. If the FAHJ determines that the plan is incomplete or inadequate, it should be sent back to the preparer with a letter explaining why. If the plan proposes modifications due to practical difficulties in meeting the code requirements, the FAHJ should determine whether to grant a modification. If the FAHJ approves a modification, the FAHJ should send a letter to the applicant and PDS finding that special individual reasons make compliance with the strict letter of the code impracticable, the proposed modification complies with the intent and purpose of the code and provides the same practical effect, and the modification does not lessen health, life, and fire safety requirements. The FAHJ must include an explanation for each finding.

Concurrent with the process at the local FAHJ, the County PDS will also review the plan. The plan will be reviewed for completeness and code compliance. If the plan is found to be complete, code compliant and to have been accepted by the FAHJ, an acceptance letter will be prepared. If the plan is found to be incomplete, to be inconsistent with code requirements or not to have been accepted by the FAHJ, PDS will not accept the plan.

The County Consolidated Fire Code includes a procedure for appealing the decision of the FAHJ relating to the application of the applicable fire code.

The County will make every effort to provide sufficient time for the FAHJ to review and comment on the proposed project and associated Fire Protection Plan. If comments are not received from the FAHJ in a timely manner, PDS will assume that the FAHJ has no comments on the proposed Fire Protection Plan. PDS will advise the final decision-making body of the FAHJ's failure to comment on the Fire Protection Plan.

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## **ATTACHMENT A: DEFINITIONS**

### **Behave:**

A system of interactive computer programs for modeling fuels and fire behavior that includes two systems: BURN and FUEL.

### **CEQA:**

The California Environmental Quality Act is a California law that requires public agencies and local governments to evaluate and disclose the environmental impacts of proposed projects adopt all feasible mitigation measures to reduce or eliminate those impacts.

### **Crown Fire:**

The movement of fire through the crowns or tops of trees or shrubs more or less independently of the surface fire. A fire is said to be "crowning" when the flames get up into the tops of trees and spreads.

### **Defensible Space:**

An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildfire and resources or lives at risk. In practice, defensible space is generally defined as an area of 30 to 100 feet or more around a structure that is cleared of flammable brush or vegetation or other fuels. This will also create an area for fire suppression to occur.

### **FAHJ**

Fire authority having jurisdiction is the designated entity providing enforcement of fire regulations as they relate to planning, construction and development. This entity may also provide fire suppression and other emergency services.

### **Fire Behavior:**

The manner in which a fire reacts to the influences of fuels, weather, and topography.

### **Fire Front:**

The part of a wildland fire in which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

### **Fire Hazard Severity Zone**

Areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. State law requires the State Fire Marshal to map areas as Very High, High, and Moderate to assist local agencies and the public with wildfire preparedness by determining where construction and other risk reduction standards apply.

### **Fire Intensity:**

A general term relating to the heat energy released by a fire.

**Fire Perimeter:**

The entire outer edge or boundary of a fire, which may contain within it substantial areas of unburned fuels.

**Flame Height:**

The average maximum vertical extension of flames at the leading edge of the fire front [fire front](#) . Occasional flashes that rise above the general level of flames are not considered. The flame height is less than the [flame length](#) if flames are tilted by winds or slope.

**Flame Length:**

The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); flame length is an indicator of fire intensity.

**Fuel:**

Combustible material. Includes vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire, as well as homes and other structures.

**Fuels Management:**

Management of wildland fuel complexes to achieve hazardous fuel reduction, to achieve and maintain ecosystem restoration, and to maintain ecosystem health and other resource benefits. Management includes strategic planning and site-specific and landscape-scale treatments designed to improve abilities to protect life and property, and to maintain or restore the sustainability of healthy ecosystems. Fuel management is accomplished by the application and integration of a variety of treatments that will minimize the probability and effects of large-scale, high-intensity fires. These treatments, a variety of fire and non-fire techniques, include, but are not limited to, mechanical, chemical, biological, and manual methods, and prescribed fire and wildland fire use. Both naturally occurring fuels and hazardous fuel accumulations resulting from resource management and land use activities must be addressed.

**Fuel Modification Zone:**

A strip of land between an improved property and wildlands, where combustible vegetation has been thinned, modified, or both, and partially or totally replaced with approved drought- tolerant, fire-resistant, and/or irrigated plants to provide an acceptable level of risk from vegetation fires.

**Fuel Model:**

Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

**Fuel Moisture:**

The quantity of moisture in fuels expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit. Also referred to as fuel moisture content.

**Fuels Reduction:**

Manipulation, including combustion or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control. Often includes thinning and/or prescribed burning.

**Fuel Treatment:**

Any vegetation manipulation and/or removal/modification of wildland fuels to reduce the likelihood of ignition, to reduce potential fire intensity and spread rates, to lessen potential damage and resistance to control, or to limit the spread and proliferation of invasive species and diseases. Fuels treatments achieve site-specific fire and resource management objectives under approved land use plans and with full compliance to NEPA and other regulatory statutes.

**Fuel Type:**

An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

**Hazard Fuel Reduction:**

Removal of excessive live or dead wildland fuel accumulations for the strict objective of reducing the potential for the occurrence of uncharacteristically intense wildland fire and increasing capabilities to protect life and property, including communities at risk and sensitive municipal watersheds; sensitive natural resources, including critical native plant communities and threatened and endangered species; and other socially important cultural resources.

**Hazard Reduction:**

Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread

**Ladder Fuels:**

Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help start and continue crowning on a fire.

**National Environmental Policy Act (NEPA):**

NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make land management decisions.

**Prescribed Fire:**

Any fire ignited by management actions under certain pre-determined conditions to meet specific objectives related to hazardous fuels reduction or habitat improvement. A written, approved prescribed fire plan must exist, and CEQA and NEPA requirements must be met prior to ignition. Prescribed fires are ignited and managed within a "window" of very specific conditions including winds, temperatures, humidity, and other factors specified in the burn plan. Prescribed fire is also referred to as a "controlled burn" or "prescribed burn".

**Prevention:**

Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuels hazards.

**Wildfire:**

Any non-structure fire, other than prescribed fire, that occurs in a wildland area.

**Wildland/Urban Interface:**

The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Often incorrectly referred to as the "interzone" or "urban/wildland interface"

## ATTACHMENT B: CEQA Environmental Checklist

### Instructions

Pages 1-3 are only needed when preparing a “checklist” IS. If the checklist will be used in the CEQA environmental document, proceed directly to Page 4 and use that as the beginning of the checklist and follow the guidance in the annotated outlines. Remove instructions before finalizing.

## CEQA Environmental Checklist

### PROJECT DESCRIPTION AND BACKGROUND

**Project Title:**

**Lead agency name:**

**Address:**

**Contact person:**

**Phone number:**

**Project sponsor’s name:**

**Address:**

**Project Location:**

**General plan description:**

**Zoning:**

**Description of project:**

Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation.

**Surrounding land uses and setting:**

Briefly describe the project’s surroundings.

**Other public agencies whose approval is required** (e.g. permits, financial approval, or participation agreements):

### NATIVE AMERICAN CONSULTATION

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code (PRC) section 21080.3.1?  Yes  No

If yes, ensure that consultation and heritage resource confidentiality follow PRC sections 21080.3.1 and 21080.3.2 and California Government Code 65352.4

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project. Please see the checklist beginning on page 4 for additional information.

- |   |  |
|---|--|
| <input type="checkbox"/> Aesthetics                         | <input type="checkbox"/> Agriculture and Forestry  |
| <input type="checkbox"/> Air Quality                        | <input type="checkbox"/> Biological Resources      |
| <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Energy                    |
| <input type="checkbox"/> Geology/Soils                      | <input type="checkbox"/> Greenhouse Gas Emissions  |
| <input type="checkbox"/> Hazards and Hazardous Materials    | <input type="checkbox"/> Hydrology/Water Quality   |
| <input type="checkbox"/> Land Use/Planning                  | <input type="checkbox"/> Mineral Resources         |
| <input type="checkbox"/> Noise                              | <input type="checkbox"/> Population/Housing        |
| <input type="checkbox"/> Public Services                    | <input type="checkbox"/> Recreation                |
| <input type="checkbox"/> Transportation                     | <input type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities/Service Systems          | <input type="checkbox"/> Wildfire                  |
| <input type="checkbox"/> Mandatory Findings of Significance |  |



## DETERMINATION

### On the basis of this initial evaluation (choose one):

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

---

Print Name

---

Signature

---

Date

## CEQA Environmental Checklist

**DIST-CO-RTE:**

**PM/PM:**

**EA/Project No.:**

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

### Instructions

Click on "Choose an item" under the CEQA Determination column to select the appropriate significance determination from the drop-down list. If discussions will be included after each resource table, follow the guidance provided in the annotated outlines.

### **AESTHETICS**

Except as provided in Public Resources Code Section 21099, would the project:

<b>Question</b>	<b>CEQA Determination</b>
a) Have a substantial adverse effect on a scenic vista?	Choose an item.
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	Choose an item.
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	Choose an item.
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Choose an item.

## AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

Question	CEQA Determination
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	Choose an item.
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	Choose an item.
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	Choose an item.
d) Result in the loss of forest land or conversion of forest land to non-forest use?	Choose an item.
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	Choose an item.

## AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

Question	CEQA Determination
a) Conflict with or obstruct implementation of the applicable air quality plan?	Choose an item.
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Choose an item.
c) Expose sensitive receptors to substantial pollutant concentrations?	Choose an item.
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Choose an item.

## BIOLOGICAL RESOURCES

Would the project:

Question	CEQA Determination
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries?	Choose an item.
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Choose an item.

Question	CEQA Determination
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Choose an item.
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Choose an item.
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Choose an item.
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	Choose an item.

## CULTURAL RESOURCES

Would the project:

Question	CEQA Determination
a) Cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5?	Choose an item.
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	Choose an item.
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	Choose an item.

## ENERGY

Would the project:

Question	CEQA Determination
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Choose an item.
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Choose an item.

## GEOLOGY AND SOILS

Would the project:

Question	CEQA Determination
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:  i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	Choose an item.
ii) Strong seismic ground shaking?	Choose an item.
iii) Seismic-related ground failure, including liquefaction?	Choose an item.
iv) Landslides?	Choose an item.
b) Result in substantial soil erosion or the loss of topsoil?	Choose an item.
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	Choose an item.

Question	CEQA Determination
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	Choose an item.
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	Choose an item.
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Choose an item.

## GREENHOUSE GAS EMISSIONS

Would the project:

Question	CEQA Determination
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Choose an item.
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Choose an item.

## HAZARDS AND HAZARDOUS MATERIALS

Would the project:

Question	CEQA Determination
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Choose an item.
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Choose an item.

Question	CEQA Determination
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Choose an item.
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Choose an item.
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	Choose an item.
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Choose an item.
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Choose an item.

## HYDROLOGY AND WATER QUALITY

Would the project:

Question	CEQA Determination
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	Choose an item.
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Choose an item.



Question	CEQA Determination
<p>c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:</p> <p>(i) result in substantial erosion or siltation on- or off-site;</p>	Choose an item.
<p>(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;</p>	Choose an item.
<p>(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or</p>	Choose an item.
<p>(iv) impede or redirect flood flows?</p>	Choose an item.
<p>d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?</p>	Choose an item.
<p>e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?</p>	Choose an item.

## LAND USE AND PLANNING

Would the project:

Question	CEQA Determination
<p>a) Physically divide an established community?</p>	Choose an item.
<p>b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?</p>	Choose an item.

## MINERAL RESOURCES

Would the project:

Question	CEQA Determination
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	Choose an item.
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	Choose an item.

## NOISE

Would the project result in:

Question	CEQA Determination
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Choose an item.
b) Generation of excessive groundborne vibration or groundborne noise levels?	Choose an item.
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	Choose an item.

## POPULATION AND HOUSING

Would the project:

Question	CEQA Determination
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	Choose an item.
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	Choose an item.

### PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

Question	CEQA Determination
a) Fire protection?	Choose an item.
b) Police protection?	Choose an item.
c) Schools?	Choose an item.
d) Parks?	Choose an item.
e) Other public facilities?	Choose an item.

### RECREATION

Question	CEQA Determination
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Choose an item.

Question	CEQA Determination
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	Choose an item.

## TRANSPORTATION

Would the project:

Question	CEQA Determination
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	Choose an item.
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	Choose an item.
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Choose an item.
d) Result in inadequate emergency access?	Choose an item.

## TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

Question	CEQA Determination
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1 (k), or	Choose an item.

Question	CEQA Determination
<p>b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</p>	<p>Choose an item.</p>

## UTILITIES AND SERVICE SYSTEMS

Would the project:

Question	CEQA Determination
<p>a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?</p>	<p>Choose an item.</p>
<p>b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?</p>	<p>Choose an item.</p>
<p>c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?</p>	<p>Choose an item.</p>
<p>d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?</p>	<p>Choose an item.</p>

Question	CEQA Determination
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Choose an item.

## WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

Question	CEQA Determination
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	Choose an item.
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	Choose an item.
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	Choose an item.
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	Choose an item.

## MANDATORY FINDINGS OF SIGNIFICANCE

Question	CEQA Determination
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	Choose an item.
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Choose an item.
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Choose an item.

## ATTACHMENT C: SUMMARY OF REVISIONS

Guidelines for Determining Significance and Report Format and Content Requirements for Wildland Fire and Fire Protection were originally approved on March 19, 2007. The following is a summary of revisions made since original document approval.

### Fourth Revision

- Rhode & Associates rewrote the guideline to meet best practices for wildfire mitigation.
- Additional revisions were made following staff review:
  - Fire history updated and included, including requirement for proposed projects to include
  - Thresholds for Full FPP and Letter FPP
  - Add examples of acceptable and unacceptable alternate methods/means mitigations
  - Clarify requirements for “Shelter in Place”
  - Link to county home hardening website
  - Include “Dead End Road” chart from Chapter 503 of the County Consolidated Fire Code
  - Include the “Travel Time” chart from the Safety Element of the General Plan
  - Clarify that consultants must request addition to the approved consultant to be eligible to prepare a FPP
  - Add criteria for determination of a third-party review of the FPP
  - Add a requirement to include a summary of proposed mitigation measure and overall determination of significance
  - Include CEQA checklist

### Third Revision, XXXXXXXX

- Updated to incorporate changes to the County Consolidated Fire Code
- Clarified that a Fire Protection Plan is required for any projects located within High/Very High Fire Hazard Zones
- Clarified that any waivers of standards shall be replaced with an alternative measure that provides the same practical effect
- Various editorial changes

### Second Revision, August 31, 2010

- Updated to incorporate changes to the County Consolidated Fire Code
- Improved standards for dead end roads
- Improved standards for Shelter-in-Place
- Various editorial changes

### First Revision, December 19, 2008



- Updated to incorporate changes to the Fire Code and the Building Code
- Updated to change California Department of Forestry (CDF) to CAL FIRE
- Added standards for dead end roads
- Various editorial changes

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**Section IV:**

**FIRE PROTECTION PLAN GUIDELINES  
FOR CONSULTANTS**

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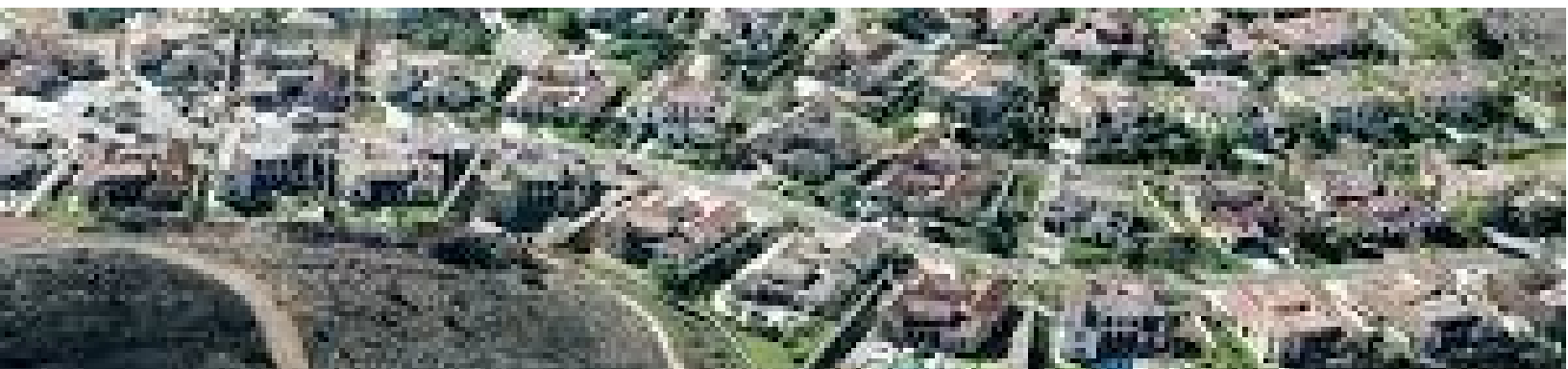
San Diego County Fire Protection District /

County of San Diego Land Use & Environmental Group, Planning & Development Services

***County of San Diego  
Fire Protection Plan Guidelines for Consultants  
DRAFT 12/11/23***



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- Figure 9: Defensible Space Zones
- Figure 10: Defensible Space Guidance for Fuels
- Figure 11: Travel Time Standards from the Closest Fire Station
- Figure 12: Climate Zones in San Diego County

## **LIST OF ATTACHMENTS**

Attachment A: Building Materials and Components - Baseline, Enhanced & Optimum Scenarios

## BACKGROUND & INTENT

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Wildfire is a chief vulnerability affecting development in San Diego County. When areas that were previously wildlands subject to periodic wildfires are developed, combustible structures and densified populations are necessarily introduced, and there may be changes to the threat potential for life and property. These vulnerabilities cannot be entirely eliminated but are significantly mitigated by development standards that require adherence to fire-resistant building codes; the creation and maintenance of fuel modification zones and defensible space; the avoidance of over-densification; the provision of safe and adequate population egress routes and the creation of buffer zones with low combustibility open spaces.

### Wildfire History

San Diego County has a significant history of destructive wildfires. San Diego County's third worst wildfire in history, known as the Laguna Fire, destroyed thousands of acres in the backcountry in September of 1970. The fire resulted in the loss or destruction of 383 homes and 1,200 other structures.

In October 2003, the second-worse wild-land fire in the history of San Diego County destroyed 332,766 acres of land, 3,239 structures and 17 deaths at a cost of approximately \$450M.

San Diego County's worst wildfire occurred in October 2007. At the height of the firestorm there were seven fires burning within the County. The fires destroyed 369,000 acres (13% of the County), 2,670 structures, 239 vehicles, and two commercial properties. There were 7 civilian deaths, 23 civilian injuries and 10 firefighter injuries. The cost of fire exceeded \$1.5 billion.

Wildland fires prompted seven (7) Proclaimed States of Emergency, and Urban/Intermix Fires prompted four (4) Proclaimed States of Emergency in the County of San Diego between 1950-2020. The table below lists the most recent major wildfires in San Diego County (copied from the Multi-Jurisdictional Hazard Mitigation Plan, 2023).

Hazard impacts can include but are not limited to increased flooding risk over burn scar areas, environmental impacts/damage, air quality impacts, loss of resources such as utilities, asset/structure damage and/or total loss, injury, and death.

Each proposed project must include the wildfire history specific to the project vicinity (see Vicinity Description, Section 1A).

**FIGURE 1: Major\* Wildfires in San Diego History**  
 (\*larger than 5,000 acres of resulting in significant structure loss)

<b>Fire</b>	<b>Date</b>	<b>Acres Burned</b>	<b>Structures Destroyed</b>	<b>Structures Damaged</b>	<b>Deaths</b>
Conejos Fire	July 1950	62,000	Not Available	Not Available	0
Laguna Fire	October 1970	190,000	382	Not Available	5
Harmony Fire (Carlsbad, Elfin Forest, San Marcos)	October 1996	8,600	122	142	1
Viejas Fire	January 2001	10,353	23	6	0
Gavilan Fire (Fallbrook)	February 2002	6,000	43	13	0
Pines Fire (Julian, Ranchita)	July 2002	61,690	45	121	0
Cedar Fire	October 2003	280,278	5,171	63	14
Paradise Fire	October 2003	57,000	415	15	2
Otay Fire	October 2003	46,291	6	0	0
Roblar (Pendleton)	October 2003	8,592	0	0	0
Mataguay Fire*	July 2004	8,867	2	0	0
Horse Fire*	July 2006	16,681	Not Available	Not Available	0
Witch Creek Fire*	October 2007	197,990	1,125	77	2
Harris Fire*	October 2007	90,440	255	12	5
Poomacha Fire*	October 2007	49,410	139	Not Available	0
Ammo Fire*	October 2007	21,004	Not Available	Not Available	0
Rice Fire*	October 2007	9,472	208	Not Available	0
May 2014 San Diego County Wildfires	May 2014	26,000	65	19	0
Border Fire	June 2016	7,609	18	4	2
Lilac Fire	December 2017	4,100	157	64	0
West Fire	July 2018	504	48	Not Available	0
Valley Fire	September 2020	16,390	66	Not Available	0
Southern Fire	May 2021	5,366	5	Not Available	0
Border 32 Fire	September 2022	4,456	14	Not Available	0

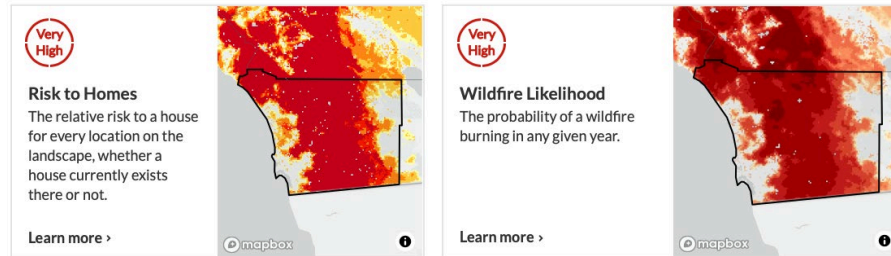
\* Information gathered from the California Department of Forestry and Fire Protection website



## Location & Extent/Probability of Occurrence & Magnitude

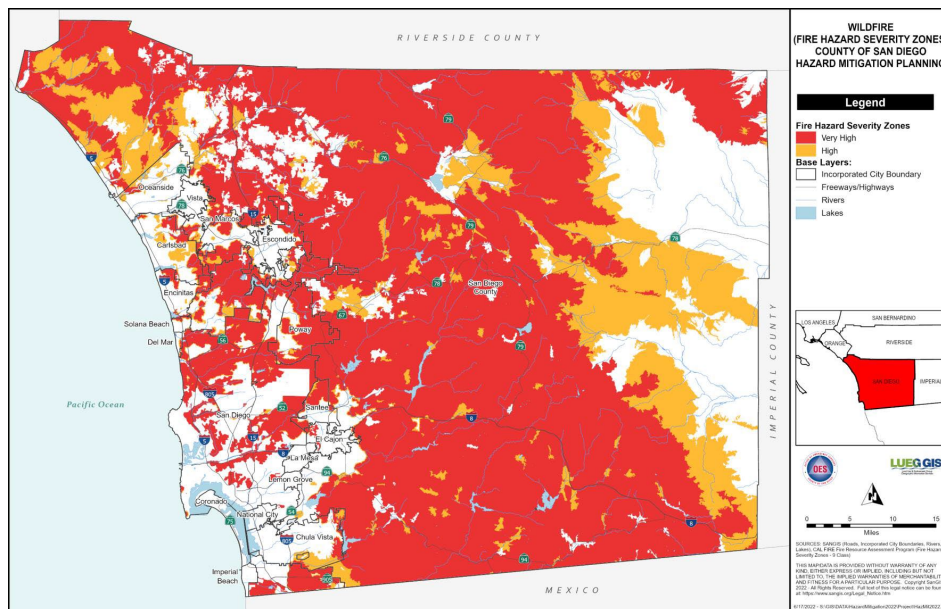
The USDA Forest Service also assesses wildfire risk nationally and states San Diego County has a very high risk of wildfire – higher than 95% of counties in the US: (<https://wildfirerisk.org/wp-content/uploads/2020/04/WRC-Info-Sheet-2020-04.pdf>)

**FIGURE 2: Wildfire Risk and Likelihood**



The wildfire maps use the CAL Fire Resource Assessment Program data for Fire Hazard Severity Zones. For the purpose of these guidelines, all zones are created equal:

**FIGURE 3: Wildfire Hazard Severity Zone Map**



Under current climate conditions, the wildfire threat to property, lives, and ecosystems in the San Diego region is very high. With hotter temperatures and possibly fewer rainy days in the coming decades, vegetation could become drier. As a result, it is likely that San Diego region will see an increase in the frequency and intensity of fires, making the region more vulnerable to devastating fires like the ones seen in 2003 and 2007. The fire season could also become longer and less predictable, making firefighting efforts more costly.

From May to October of each year, San Diego County faces a severe wildfire threat. Fires will continue to occur on an almost annual basis in the San Diego County Area. The threat of wildfire and potential losses consistently increase as human development and population increase in the wildland urban interface area in the County. According to the Cal Fire Redbook, there have been 1,113 wildfires recorded for San Diego County between 2015 and 2021. Based on climate and weather in San Diego County and the fuels, topography, past fire history, and the Cal Fire Redbook which indicates an average of 159 wildfires per year, the probability of future wildfire events are considered “Highly Likely”.

The effective use of wildfire hazard information in the early planning or entitlement phases of new development is critical to allowing the county to more comprehensively plan and design against potential loss of life, property, or other assets. It is fundamental that the evaluation of wildfire hazard conditions is not only conducted at the parcel level, but also the subdivision and community scales. The maps resulting from a wildfire hazard assessment can help communities to:

- decide where development should be encouraged or avoided;
- justify where regulations may be applied differently across the landscape;
- establish authority to make codes enforceable;
- require adequate fire protection standards;
- identify permitted and conditional land uses in higher risk areas;
- prioritize fuel reduction efforts;
- educate and communicate risk to the public; and
- empower county and city staff to act.

## INTENT

A Fire Protection Plan (FPP) is a document that describes the level of fire hazard that would affect or be caused by a proposed development and the methods proposed to minimize or mitigate that hazard. The FPP also evaluates the consistency of the proposed project with applicable fire protection regulations, and the ability of emergency services to provide fire and life protection. To minimize hazards and meet fire code requirements, the FPP may include recommendations that involve limitations on future land use on the subject property, building construction standards, vegetation management, access improvements, installation of fire suppression facilities, and other design measures. The FPP must include measures to address the specific location, topography, geology, level of flammable vegetation and climate of the proposed project site. The FPP must be prepared consistent with applicable fire codes and be accepted by the FAHJ and County. The plan must demonstrate compliance with the applicable fire code or how the measures proposed to reduce fire hazards are adequate to meet the intent of the code. The following elements must be addressed in a FPP required as part of the review of a discretionary permit application:

- Wildfire hazard and risk assessment
- Siting of development
- Housing density considerations
- Construction
- Access, egress, and evacuation planning
- Water sources for firefighting
- Subdivision landscaping and vegetation management
- Protection of critical infrastructure
- Emergency Services - Availability and Travel Time

The FPP is also required by County Policy found in the Safety Element, Chapter 7 and is used to demonstrate fire safety compliance in accordance with requirements of the California Environmental Quality Act.

Fire risk mitigation considerations that are required to be detailed within the FPP are identified below and includes discussions on relevant fire and building codes, CEQA compliance, and standards that are used to ensure compliance with the regulations. Failure to comply with either the fire code/regulations or the standards may result in a potentially significant impact, or a recommendation against permitting.

Wildland fire mitigation measures and design considerations decided in the planning and land use approval process vary depending on the wildland characteristics of the site and surrounding area. In order to incorporate appropriate site specificity into project design and code compliance, the submitted FPP will be relied upon by both planners and stakeholders to understand the unique characteristics of described projects. Professional technical judgement and code interpretation will arise from information presented in the FPP. For this reason, it is essential that FPP preparers complete a rich and detailed document that accurately and robustly describes the project.

## PREPARING THE FPP

The Fire Protection Plan (FPP) shall follow the formats and guidance in this document. The overall length of the FPP and the amount of information included will vary depending on the size and scope of the project and associated environmental characteristics. Project applicants frequently utilize consultants to prepare the FPP/Full Report. All consultants must be listed on the County of San Diego CEQA Consultant List for Fire Protection Plans to be eligible to prepare a FPP.

(<https://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/CeqaConsultantsList.pdf>)

### FPP (Full Report)

A FPP shall be prepared for projects located within High and/or Very High Fire Hazard Severity Zones as identified in the map adopted by the State Fire Marshal. A FPP is also required for large projects (an occupant load of 100 or more) or where the site has topographic, geographic, and/or combustible vegetation conditions that require detailed review and analysis, regardless of zone.

- **Third Party Review**

The County/Fire Marshal may require review of the completed FPP by a third-party independent contractor, approved by the County and paid by the proponent. Determination of the need for third-party review is based on the scope, scale, and complexity of the project and is at the sole discretion of the County/Fire Marshal.

- **Fire Fuel Assessment (Fire Behavior Model)**

Fire Behavior Modeling shall be conducted for projects located within High and/or Very High Fire Hazard Severity Zones as identified in the map adopted by the State Fire Marshal, and may be required in other areas in conjunction with a FPP (Full Report) for large projects and/or projects with high fuel loads and/or steep topography.

### FPP (Letter Report)

A FPP – Letter Report may be authorized by the Fire Authority Having Jurisdiction (FAHJ) for infill projects with no wildlands in the immediate vicinity or low hazard commercial projects in Moderate Fire Hazard Severity Zones.

The FPP – Letter Report is a simple narrative documenting site information and fire code compliance and is not intended to require the services of a Fire Consultant. If, upon review of the FPP – Letter Report, code issues are determined to be unresolved or inadequately addressed, a FPP Full Report will be required.

The FAHJ may also waive FPP requirements altogether if the wildfire risk is determined to be minimal. This determination may be based on the fire hazard rating for the area as well as occupancy classification and construction type of the proposed project.

## FPP Development

Development of the FPP shall follow these general steps.

1. The applicant shall consult with Public Works and the Fire Authority Having Jurisdiction (FAHJ) regarding, but not be limited to, an evaluation of slope, aspect, fire topography, fire history/potential, habitat, adjacent properties (existing structures, fuel modification, habitat, parkland status), existing vegetation, fuel modification, type of plants to be planted on site, fire hydrant locations and fire flows, and access standards (e.g., width, grade, slope, paving, overhead clearance).
  - After consulting with Public Works and the FAHJ, the applicant shall prepare all necessary plans, including but not limited to a site plan for the proposed project that includes all mitigation measures necessary to comply with the recommendations and requirements of those agencies. The site plan shall show all aspects of development including, but not limited to, grading, construction of retaining walls or flood control devices, fuel modification areas, accessways, water lines, and irrigation systems necessary to mitigate any hazards on the property.
2. All new development shall be sized, sited, and designed to minimize risks to life and property from fire hazard, considering changes to fire risk caused by increasing global temperatures. In addition, all new development shall comply with the following requirements:
  - New development shall be required to use design and construction techniques and materials that minimize risks to life and property from fire hazard. Structures shall be constructed with appropriate features and building materials, including but not limited to fire-resistant exterior materials, windows and roofing; and eaves and vents that resist the intrusion of flame and burning embers. Development sites and structures shall be located off ridgelines and other dangerous topographic features such as chimneys, steep draws, and saddles.
  - New development shall incorporate fuel modification and brush clearance techniques and shall be designed and carried out to minimize clearance of natural vegetation and reduce impacts to sensitive natural habitat to the maximum extent feasible.
  - New development shall provide for emergency vehicle access and adequate fire-flow water supply in compliance with applicable fire safety regulations. Development in areas with insufficient access, water pressure, fire flows, or other accepted means for adequate fire protection shall be prohibited.
  - Prior to development approval, all new development shall demonstrate the availability of an adequate water supply for fire protection in compliance with applicable fire safety regulations. Where feasible, alternative water resources for fire-fighting purposes shall be maintained on development sites. Water tanks shall be sized consistent with County minimum requirements and clustered with approved structures.

- Residential structures shall be clustered to provide for more localized and effective fire protection measures such as consolidation of required fuel modification and brush clearance, fire break maintenance, firefighting equipment access, and water service. Structures shall also be located along a certified all-weather accessible road, which in some cases may consist of permeable surfaces, in a manner that provides firefighters adequate vehicle turnaround space on private properties. Where feasible, new development shall be accessed from existing roads.
3. As a condition of approval of new development within or adjacent to an area subject to high wildfire hazards, prior to development approval, the property owner shall be required to submit a signed document that shall indemnify and hold harmless the County, its officers, agents, and employees against any and all claims, demands, damages, costs, and expenses of liability arising out of the acquisition, design, construction, operation, maintenance, existence, or failure of the permitted project in an FHSZ.

### **FORMAT OF THE FPP**

Unless an exception is granted by the County and FAHJ, the draft FPP shall have the components described in this Report Format and FPP content requirements:

- Documents that do not contain all mandatory sections will not be accepted as complete, unless the exception is approved by the Director, PDS and the FAHJ.
- The FPP shall be drafted in Microsoft Word (2003 version or later) in digital format. (County staff may also request PDF format in addition to digital versions)
- The length of the FPP shall be kept to a minimum and only contain what is required to accurately and factually convey legally required data and rational.
- The draft FPP must be properly edited for correct format, spelling, grammar, page numbering, internal consistency and other editorial matters. It must also be consistent with project submittals. The draft FPP must be prepared in a clear format, written in clear language for review and understanding by decision-makers and the public (see CEQA Guidelines, § 15140). Complex and extremely analytical materials must be summarized and simplified, with the details and harder to comprehend materials placed in the technical appendices. The document should be technical in nature but summarized where possible for clarity.
- The draft FPP must be written in a factual and objective manner. The document must provide a good-faith effort of full disclosure (e.g., if code requirements are not met, that information must be stated, accompanied by proposed mitigation measures).

- The draft FPP must cite all documents used in its preparation including, the section number of any relevant codes or regulations. Other documents may be incorporated by reference, provided that the referenced document is summarized in the draft FPP and is made available for public inspection at a public place identified in the draft FPP, which shall include a County office.
- The FPP must be inclusive of project data sufficient for the FAHJ to understand the full complexity of the project, the development site, and associated fire risks.
- Use consistent terminology and cite applicable policy and regulation as appropriate.
- All plot plans and maps must be to standard engineering scale and contain a North arrow and both number and bar scales and clearly legible.
- In draft copies of the report, all changes made in response to staff comments must be shown in strikeout/underline form. "Strikeout/underline" draft and "clean" copies should be submitted simultaneously. Final copies of the report must be clean, with all editing marks removed.
- The Draft FPP will be reviewed for technical accuracy and completeness by a County Fire Code Specialist and the FAHJ's Fire Marshal. The plan is considered to be draft until County staff determines the report to be complete.
- The FPP shall use mandatory, not permissive language, as the document will be binding on the project if the project is approved.

### **FPP OUTLINE (Full Report)**

#### **Binder Cover and Cover Page**

The Cover Page of the FPP shall include the following information:

- Project common name
- Project applications numbers. Must include all associated discretionary permit numbers (e.g. TM XXXX, TPM XXXXX, ZAPXX-XXX) and the environmental log number (Log No. XX-XX-XXX)
- Date of the original report, followed by the date(s) of all iterations
- Principal author's name, firm name and address
- Signature of principal author
- Project applicants' names and addresses
- A statement that reads: "*Prepared for the County of San Diego*"
- Color photo of the project site

#### **Table of Contents**

The table of contents must follow the order and format outlined in this document. Page numbers should be assigned when possible. Titles of each attachment/appendix should be listed in the order in which they are found in the document. The Table of Contents must be formatted in the following manner:

Example:



## CHAPTER I. CHAPTERS SHALL BE SPECIFIED BY NUMBER AND SHALL BE PRESENTED IN BOLD AND IN ALL CAPS

*I.I First level subchapters shall be specified by number and shall be presented in upper and lower case, bold, and underlined*

I.I.I Second level subchapters shall be specified by number and shall be presented in upper and lower case, and bold.

I.I.I.I Third level subchapters shall be specified by number and shall be presented in upper and lower case, italics, and bold.

### **Executive Summary**

The purpose of the Executive Summary is to provide a quick reference for the public and decision-makers. Therefore, the language should be less technical than that used in the remainder of the document and should be no more than one page in length. The Executive Summary should include a brief summary of the project, associated wildfire risks and proposed mitigation. No information should be provided in the summary that is not further explained elsewhere in the document.

Every FPP shall include the following introductory language:

*“This FPP has been prepared for the **(insert common name of the project here)**. 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, aspect, geology, combustible vegetation (fuel types), climatic conditions, and fire history.*

*The plan addresses water supply, access (including secondary/emergency access where applicable), structural ignitability and fire resistive building features, 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 the types and methods of treatment 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”.*



## **PROCESSING THE FPP**

FPP preparers should work with the local FAHJ for the proposed project site. Once the FPP is prepared and submitted to the local fire agency, it will be reviewed for compliance with all applicable ordinances and regulations. If practical difficulties in achieving compliance have been identified and modifications or alternate methods are proposed, they must also be evaluated by the FAHJ. If the FAHJ determines that the plan is incomplete or inadequate, it should be sent back to the preparer with a letter of explanation for the determination.

Concurrent with the process at the local FAHJ, the County PDS will also review the plan. The plan will be reviewed for completeness and code compliance. If the plan is found to be complete, code compliant and to have been accepted by the FAHJ, an acceptance letter will be prepared. If the plan is found to be incomplete, to be inconsistent with code requirements or not to have been accepted by the FAHJ, PDS will not accept the plan. The County Consolidated Fire Code includes a procedure for appealing the decision of the FAHJ relating to the application of the applicable fire code.

## **ALTERNATE MEANS AND METHODS**

The project, through its FPP, may propose modifications to code compliance (known as “Alternative Means or Methods” or AMM) due to practical difficulties in meeting the code. Consideration of an AMM by the FAHJ requires the following conditions:

- Site specific and compelling reasons make compliance with the strict letter of the code requirements impracticable.
- The proposed modification complies with the intent of the code.
- The proposed modification provides the same practical effect
- The proposed modification does not lessen compliance with the intent of the code

AMM’s must be site specific, often detailed lot-by-lot, and are considered for their effectiveness against site specific risks. The FPP must detail why compliance with the code is unachievable, must identify the proposed siting of the AMM by a map or other display, and must provide a rational for use of the AMM on the site in question.

Due to unique site characteristics, there may also be combinations of site/project improvements and opportunities that make adequate mitigation achievable when standards cannot be met. The standards listed below are considered a “starting point”. Nothing in these standards precludes a FAHJ and/or the County from identifying other measures that would adequately mitigate unique site characteristics/conditions. Any exceptions under the code shall be replaced with an alternative measure that provides the same practical effect.

### **Emergency Response Related Standards**

- The type and number of fire apparatus available to serve the project are reliable, well-staffed and redundant. Examples include multiple engines with full-time career or reserve staff, with travel times approximating the “first-in” engine.

- Adequate funding is legally committed in perpetuity to the fire authority for staffing inspections, enforcement and educational programs.
- Adequate road widening and improved road surfacing that generally improves the access to the subject property and surrounding uses.
- The project is supported with a public water system with fire hydrants along access roads at reduced distances and with at least a fire flow of 2,500 gallons per minute.
- Security (privacy) gates or other types of barricades are generally discouraged as they can obstruct civilian egress and responder ingress during a fire emergency. However, in certain circumstances, gates can be allowed if they provide a rapid and reliable means of firefighter ingress and unobstructed egress for civilian evacuation as determined by the FAHJ. Refer to section 5.2.1.2 of these guidelines.
- The project provides funding in perpetuity to support adequate fire agency staffing for fire suppression, fire code enforcement and community safety education. An example would be the establishment of a Community Facilities District to assist in the long-term funding of fire district operations and management.

### **Community Adaptation Related Standards**

- The project is in a developed area or an area with long-standing agricultural operations.
- Adequate Fuel Modification separates the project and open space/wildland areas, including vegetation with low probability of ignition, rapid spread, or high intensity around project access points.
- Siting configurations meet the most recent scientific findings for fire spread.
- Construction standards meet the most recent scientific findings for ignition resistance (see table in Figure xx) and/or spacing.
- The number of lots that can be located on a single point of access are limited.
  - 150 dwelling units where the restriction is designed to be permanent and the street or street system does not traverse a wildland area which is subject to hazard from brush or forest fire;
  - 75 dwelling units where the restriction is designed to be permanent and the street or street system traverses a wildland area which is subject to hazard from brush or forest fire;
  - 300 dwelling units, where the restriction is subject to removal through future development.

If the roadway paving on that portion of the street or street system forming the restriction is less than 36 feet in width and is not to be widened to 36 feet or more as a part of the development of the division of land, the permitted number of dwelling units shall be reduced by 25 percent if the pavement is 28 feet or more in width, and by 50 percent if the pavement is less than 28 feet in width. If the roadway paving on that portion of the street or street system forming the restriction is 64 feet or more in width and the restriction is subject to removal through future development, the permitted number of dwelling units may be increased to 600. In no event shall the pavement width be less than 20 feet.

### **Required Findings for Alternatives to Standards**

Certain site-specific situations may make the strict adherence to the County Consolidated Fire Code either impracticable or infeasible. If a modification is proposed, the requirements of the County Consolidated Fire Code specific to modifications apply. The fire code official is authorized to approve a modification to the fire code requirements when the proposed modification is supported by the following “findings”:

- Special circumstances make the strict letter of the code impracticable;
- The modification is in compliance with the intent and purpose of the code, and provides the same practical effect;
- Such modification does not lessen health, life, and fire safety standards;
- Specific section(s) for which a modification is requested;
- Material facts supporting the need for a modification;
- Details of the modification or mitigating measure proposed, and if applicable, a map showing the proposed location of the modification or mitigation measures;
- The modification is documented in the FPP and separated provided to the FAHJ.

### **Scenarios where AMMs will not be Considered:**

The following safety requirements are critical and alternatives will not be considered:

- Defensible space conditions within 0-5 feet of a structure and 5-50 feet of a structure
- Evacuation route roads that are paved and meet public road standards with 24-hour guaranteed access

### **Scenarios where AMMs are Unlikely:**

Alternate measures that do not exceed the level of safety provided by the requirements of the adopted plans, codes, and regulations, will not be approved. There also may be situations where a combination of site conditions/constraints, such as those listed below, are so severe that it is unlikely that sufficient mitigation could be provided. In such scenarios, projects may result in a significant impact:

- Project site is surrounded by large wildland areas with little existing or planned surrounding development.

- The primary access road is substandard with no proposal to adequately/reasonably improve it.
- Project site is surrounded by steep slopes and significant topographical constraints that could intensify fire behavior or limit fire suppression operational flexibility.
- Legal access rights have not been obtained for the primary access road and any necessary secondary access road.
- Fire stations available to serve the project site are located substantial distances from the project site such that response by multiple units is significantly delayed.
- The available water supply for fire suppression is limited to tanks, pools or ponds that have limited capacity and require pumping operations.

The FAHJ will review AMM requests and determine if they are in agreement with the identified site constraints and proposed mitigations. If so determined, the FAHJ must process a letter to the project applicant and County PDS accepting the AMM in consideration of the four factors cited above and grant the exception. Should the FAHJ determine not to grant the exception, the applicant and County must also receive that decision in writing along with the reasons for the determination. The project applicant may appeal the decision in accordance with appeal provisions in the County Consolidated Fire Code.

### **COMMENT PERIOD FOR THE FPP**

The County PDS will designate a comment period following receipt of a project's filing and FPP, allowing sufficient time for the FAHJ to review and comment on the proposed project and associated Fire Protection Plan. The County PDS and its fire agencies will work cooperatively in the review of these documents. Should the FAHJ elect to provide no comment during the specified comment period, the County will advise decision makers of the lack of comment by the FAH.

## **CONTENT OF THE FPP**

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The FPP content is summarized in Section I and detailed in Section II of this document.

### **SECTION I: SUMMARY OF REQUIRED TOPICS**

The contents of the FPP are outlined in the County Consolidated Fire Code (CCFC). The following summarizes elements that must be addressed in a FPP as part of the review of the discretionary permit application:

#### **Vicinity, Site and Project Description and CEQA Impacts**

- a. Vicinity Description: Information on adjoining properties on all sides
  - Current land uses
  - Existing structures and densities
  - Planned construction
  - Natural vegetation
  - Environmental restoration plans
  - Roads and parks

- Fire history (fire names, acreage burned, structure lost, etc.).
- b. Site Description
- Site and regional topographic, and aerial maps
  - A detailed 8.5"x11" or 11"x17" copy of the proposed subdivision map
  - Lot location map and development layout
  - Legal descriptions of the development property
  - Location of project relative to High or Very High Fire Hazard Severity Zone
  - Description of site topography and geology
  - Description of current site vegetative cover
  - Current ownership and land use
  - Description of neighboring/regional character
- c. Project Description: A detailed description of all project components including;
- Size of the project site and area of proposed development
  - Purpose and scale of proposed uses (residential, commercial, etc.)
  - Number, size, and purpose of proposed structures
  - Size of the structures
  - Location of all easements
  - Off-site improvements, roads utility corridors, and other features
  - Existing fire stations or other public facilities
- d. The applicant should provide a narrative of anticipated fire behavior in the project vicinity including:
- Fire history
  - Fuels
  - Terrain
  - Weather
  - Intensity, both before and after mitigation (if any).
- This narrative should include a brief summary of fire behavior modeling results and set the tone for project analysis and mitigation measures that follow.
- e. CEQA Determination of Significance (see excerpt from *Appendix G Environmental Checklist* below)
- Thresholds of Significance-List the thresholds for significance applicable to the project
  - Significant Impacts-The project shall summarize any significant impacts identified through the FPP's detailed assessment, and any applicable mitigations.

**FIGURE 4: CEQA Wildfire Checklist**

<b>XX. WILDFIRE.</b> If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Building Construction Standards and Requirements

- Discuss methodology for compliance with Fire and Building Code
- Identify ignition resistant construction methods and practices, including hardening against ember cast and ignition
- Discuss use of fire sprinkler systems
- Discuss fire resistiveness of attic vents
- Discuss site layout and placement of structural development in relation to topography
- Propose additional enhancements to mitigate severe fire hazards, as required
- Discuss development and yard limitations required for fire safety
- Discuss structural spacing and density and any means utilized to prevent fire transmission between structures.

Also see the San Diego Home Hardening Initiative information at: <https://www.sandiegocounty.gov/content/sdc/sdcfa/crr/ca-wildfire-mitigation-program-.html>

### Vegetation Management

- Identify native fuel conditions for the site and within one-mile of the project perimeter
- Discuss fuel modification to protect the community
- Discuss defensible space for structural development, including design
- Detail defensible space for structure within 0-5 feet, 5-50 feet, and from 50-100 feet of all proposed structures.
- Discuss fuel modification necessary to protect principle transit/evacuation routes and temporary safe refuge sites
- Detail use of approved fire resistive plant pallet for ornamental planting and landscapes (fuel modification and defensible space)
- Discuss maintenance methods, frequency and responsibility for fuel modification and defensible space

### Community Critical Infrastructure:

- Discuss fire hardening of water, telecommunications, and electrical distribution, storage, and transfer systems

- b. Discuss utilities maintenance responsibility and targets for fire risk mitigation
- c. Discuss the proposed development or utilization of any alternate energy technologies including solar, wind, battery, or other power supply, and associated fire risk mitigation.

### **Access and Egress:**

- a. Detail availability for simultaneous access and egress by emergency responders and evacuees
- b. Present at least two routes of emergency access egress (unless condition is waived by FAHJ/Director-PDS/LUEG)
- c. Identify project proposed gating, gate staffing, and emergency access controls,
- d. Discuss dimensions, grades, and design of principle circulation and roads, cul-de-sacs, turn-arounds, parking controls and ensure emergency vehicle access.
- e. Identify any traffic calming features and potential impacts to emergency response and/or evacuation
- f. Identify principal escape routes (must be built to County road standards and have 24hr. civilian Access, and assured power supply if gated)
- g. Discuss if proposed evacuation routing is shared with any adjacent communities and identify potential impacts from joint and simultaneous use

### **Community Evacuation Plan and Temporary Safe Refuge**

- a. Plan for communicating wildfire emergency alerting
- b. Plan for management of infirmed or disabled populations
- c. Plan for Temporary safe refuge if evacuation cannot be completed safely, including location, access, and capacity
- d. Plan for maintenance and dissemination to community of evacuation plan
- e. Identify evacuation target locations and distances from the proposed development. Discuss wildfire entrapment potential on these routes, if any.
- f. Identify community internet and cellular access for emergency notification

### **Water Supply**

- a. Detail fire suppression water supply distribution systems, reservoirs, and relate facilities
- b. Describe fuel modification and facility hardening for critical water facilities
- c. Identify any development areas that require pumping or lift to obtain fire flows and emergency redundancies
- d. Identify water sources (groundwater, regional water systems, desalination, etc.
- e. Identify and map water pressure, and hydrant placement and spacing,
- f. Identify capacity of reservoirs and duration of fire flow
- g. Ensure a minimum of 2,500 GPM fire flow from all fire hydrants

### **Emergency Services**

Analysis of existing fire and emergency medical services capability to serve new development, and identification of new, development driven needs and proposed mitigations (if any)



## Traffic Engineering, Road Standards, and Circulation

*(This area is reserved for future study and requirements)*

### Alternative Means and Methods (AMM):

- a. Identify the specific location, intent, and mitigation provided by any requested “Alternate Means and Methods”, cite the fire or building code requirement involved, and discuss why strict compliance may not be achieved.
- b. Include a site map demonstrating the placement of the AMM
- c. Present AMM requests on a site specific or lot-by lot basis only

### Wildfire Behavior Assessment

- a. Description of wildfire history and trajectory within 5 miles of the development site
- b. Description of 20-year average weather and climate conditions affecting wildfire behavior, including analysis of dominant weather conditions and Santa Ana wind episodes
- c. Description of native fuels condition on the site both pre and post development
- d. Describe the geographic features within and adjacent to the development site affecting wildfire behavior
- e. Complete fire behavior modeling for the development site to include vegetated areas up to one-mile from the project perimeter. Complete modeling per this document’s guidance- (see page XXX)

## SECTION II – DETAILED REQUIREMENTS FOR FPP 5

The following sections detail the requirements and expectations for FPP development:

### VICINITY, SITE AND PROJECT DESCRIPTION AND CEQA IMPACTS

- a. Site and regional topographic, and aerial maps should be provided for the site, demonstrating both the current and proposed condition, including development layout. A lot map should be included with development layout
- b. Provide the legal descriptions of the development property
- c. Provide a description of site topography and geology
- d. Provide a description of the current vegetative cover, including age, health, continuity, size, and type
- e. Provide current land ownership and land use descriptions
- f. Provide a description of neighboring/regional character
- g. Describe the project’s location relative to the San Diego County designated Fire Hazard Zones: <https://www.sandiego.gov/fire/services/brush/severityzones>
- h. The size of project area and area proposed for development should be described
- i. State the purpose and scale of the proposed use (i.e.: residential, commercial, etc.)
- j. Identify all easements within the proposed development including open space, utilities, roads, limited building zones, etc.
- k. Describe any proposed open space or riparian areas within the development site and any plans for retention of these areas.
- l. Identify off-site improvements such as roads or utilities and how they will be affected or integrated into the project.



- m. Identify public facilities within the proposed development (example: existing fire stations).
- n. Evaluate project compliance with CEQA Significance Guidelines and thresholds
- o. Summarize potential impacts exceeding CEQA identified thresholds as are determined or stated in the FPP and identify proposed mitigations. For each significant impact, determine if the proposed mitigation measures have reduced the significance level to “less than significant” in accordance with the stated Significance Guidelines and, if so, explain why.

### **Setbacks**

Title 14/Fire Safe Regulations includes, in Section 1276.02, requirements related to ridgelines.

- a. The Local Jurisdiction shall identify Strategic Ridgelines, if any, to reduce fire risk and improve fire protection through an assessment of the following factors:
  - 1) Topography;
  - 2) Vegetation;
  - 3) Proximity to any existing or proposed residential, commercial, or industrial land uses;
  - 4) Construction where mass grading may significantly alter the topography resulting in the elimination of Ridgeline fire risks;
  - 5) Ability to support effective fire suppression; and
    - (a) Other factors, if any, deemed relevant by the Local Jurisdiction.
    - (b) Preservation of Undeveloped Ridgelines identified as strategically important shall be required pursuant to this section.
    - (c) New Buildings on Undeveloped Ridgelines identified as strategically important are prohibited, as described in subsections (c)(1), (c)(2), and (c)(3).
  - 6) New Residential Units are prohibited within or at the top of drainages or other topographic features common to Ridgelines that act as chimneys to funnel convective heat from Wildfires.
  - 7) Nothing in this subsection shall be construed to alter the extent to which utility infrastructure, including but not limited to wireless telecommunications facilities, as defined in Government Code section 65850.6, subdivision (d)(2), or Storage Group S or Utility and Miscellaneous Group U Structures, may be constructed on Undeveloped Ridgelines.
  - 8) Local Jurisdictions may approve Buildings on Strategic Ridgelines where Development activities such as mass grading will significantly alter the topography that results in the elimination of Ridgeline fire risks.
  - 9) The Local Jurisdiction may implement further specific requirements to preserve Undeveloped Ridgelines.

The County Fire Code also has requirements for setbacks adjacent to protected areas. Buildings and structures shall be setback a minimum of 100 feet from any property line adjacent to a national forest, state park or open space preserve. This setback may be reduced when existing permitted buildings and structures are located within 100 feet of the property line or additional mitigation measures are employed that are satisfactory to both the FAHJ and the building official.

## CEQA

A CEQA mandatory “finding of significance” is required if the project has the potential to substantially change or degrade the quality of the environment, habitat, fish and wildlife, or plant populations, or substantially remove or restrict the range of threatened, endangered, or sensitive species, affect human beings either directly or indirectly, or eliminates important examples of California pre-history. The project must consider both direct impacts and the effects of area incremental development. (California Environmental Quality Act Public Resources Code, section 21000 et seq. CEQA).

In the opinion of the California Attorney General (CAG, 2022), CEQA requires an analysis of “any significant environmental effects the project might cause or risk exacerbation by bringing development and people into the area affected,” including by locating development in wildfire risk areas and must consider whether a project will “expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.” The CAG indicates that three factors must be included in the analysis; project density, project location in the landscape, and water supply and associated infrastructure.

The following general guidance for siting a subdivision or development can reduce project significance relative to CEQA, as well as assist in mitigating wildfire risk:

- Avoid selecting a construction site along a gully or in a narrow canyon
- Avoid selecting a construction site in or adjacent to a saddle or narrow mountain pass
- Avoid impacts to nature reserves, conservancies, similar public lands
- Avoid constructing a new development adjacent to or on a steep slope. If a ridgetop site is selected, consider the following:
  - Choose an area that allows for a minimum 30–100-foot setback from wildland vegetation on the downslope side.
  - Increase the setback at sites with heavier fuels such as in a forested environment.
  - Develop a fuel modification and long-term vegetation management plan for the steep slopes proximate to the development site. Given specific topographic and vegetative conditions more than 100 feet of defensible space will likely be needed. In some jurisdictions, this can be as much as 200+ feet (e.g., Los Angeles County and Orange County).
- Avoid constructing a new development adjacent to an unmanaged open or wildland space where 50 to 100 feet of defensible space cannot be provided on the proposed site. If a site is selected that is proximate to an unmanaged open or wildland space, consider the following design features:
  - Integrate inherent fuel breaks such as fruit orchards, irrigated landscaping/greenbelts, golf course or other similar low-wildfire hazard features.
  - Consider providing increased structural hardening measures for structures proximate to the open or wildland space such as 6-foot non-combustible perimeter walls or 1-hour fire-resistant exterior walls and protected openings.
  - Consider other building-scale defenses, e.g., building orientation relative to fire flow paths, debris and ember accumulation, window number, and orientation.

## BUILDING CONSTRUCTION

The County of San Diego Building Code and the San Diego County Consolidated Fire Code have enhanced and adopted California Building Code Chapter 7A requirements for life and property protection for properties and building within the Wildland-Urban Interface.

Large and destructive wildfires struck San Diego County in 2003 and 2007, with several factors identified leading to significant structural loss including:

- Vulnerable building construction
- Structures ignited by native and landscape vegetation
- Poor access and escape routes
- Inadequate water supplies
- Limited firefighting resources.

Following these wildfires, changes in the building and fire code were adopted that have hardened compliant structures from ignition, increasing their wildfire resilience more than 6x. The current code requirements are summarized below.

### Requirements for Construction of Structures

- **Roofs:** Roofs shall have a minimum Class 'A' roof covering. For roof coverings where the profile allows a space between the roof covering and roof sheathing, the spaces shall be fire-stopped with approved materials to keep out flames and burning embers.
- **Exterior walls:** Exterior wall surfaces must be non-combustible (stucco, masonry, cement-fiber board, etc.), ignition-resistant, heavy timber or log wall construction. Stucco and cement plaster used as an exterior wall covering shall be minimum 7/8 inch thick. Noncombustible or fire-retardant-treated wood shake used as an exterior wall covering shall have an underlayment of minimum 1/2-inch fire-rated gypsum sheathing that is tightly butted, or taped and mudded, or an underlayment of other ignition-resistant material. As an exception, around door and window openings, maximum 3/4-inch thick combustible trim with an underlayment of ignition-resistant material.
- **Eaves:** Eaves, soffits and facias must comply with requirements for ignition-resistant construction. (See <https://www.sandiegocounty.gov/content/dam/sdc/pds/docs/pds198.pdf> for possible options.)
- **Unenclosed Underfloor Areas:** Homes built on stilts or using open post-and-beam construction are not permitted unless the underfloor area is enclosed to the ground with non-combustible construction.
- **Vents:** All vents (attic, underfloor, combustion air, etc.) must resist the intrusion of flames and burning embers into the structure. Ventilation openings for enclosed attics, eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation openings, and vent openings in exterior walls and exterior doors shall be listed to ASTM E 2886 and comply with all of the following:
  - There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
  - There shall be no flaming ignition during the Integrity Test portion of the Flame

- Intrusion Test. The maximum temperature of the unexposed side of the vent shall not exceed 662 degrees Fahrenheit (350 degrees Celsius).
- **Windows (glazing):** Windows shall be dual-glazed units with a minimum of the inside pane tempered **or** shall be glass block units **or** shall have a fire-resistance rating of 20 minutes. Vinyl window frames must have welded corners to prevent glass from falling out with flame impingement and metal reinforcing in the interlock area to prevent the windows from opening or falling unexpectedly. In addition, vinyl windows must have a label showing they are certified to AAMA/WDMA/CSA 101/I.S.2/A440 structural requirements.
- **Skylights:** Skylights shall be tempered glass.
- **Insulation:** Paper faced insulation is not permitted in attics or ventilated spaces due to the potential of embers igniting the paper. Foil-backed or un-faced fiberglass batts and blankets are better suited to conditions of potential fire hazards. Use foil-backed insulation in areas where a vapor barrier is required.
- **Roof Gutters:** Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris.
- **Exterior doors:** Exterior doors shall have an exterior surface or cladding of noncombustible or ignition-resistant material **or** be constructed of solid-core with stiles and rails wood not less than 1-3/8-inch thick **or** have a fire protection rating of not less than 20 minutes per NFPA 252 **or** meet SFM Standard 12-7A-1.
- **Decks, balconies, carports, patio covers, and exterior stairs (exposed structural members):** Exposed structural supports and framing members for decks, balconies, carports, patio covers, exterior stairs, and other projections and attachments must be one, or a combination, of the following:
  - Non-combustible construction (such as concrete or metal)
  - Fire-retardant treated wood (pressure-treated, listed for exterior use, installed per listing)
  - Modified heavy timber construction (minimum 2x exterior grade tongue-and-groove roof sheathing, 4x6 roof rafters/beams, 4x8 floor joists, 4x10 or 6x8 floor beams and stair stringers, 6x6 posts/columns, 3x blocking, 4x stair treads with steel angles)
  - One-hour fire-resistive construction

Note: All other exposed surfaces must be enclosed with ignition-resistant materials such as stucco or cement-fiber material. There is no fire-resistive requirement for handrails and balusters.
- **Deck, balcony, porch, stair, and landing surfaces:** The surfaces of decks, balconies, and exterior stair treads/risers/landings must be one, or a combination, of the following:
  - Non-combustible construction (such as concrete or tile)
  - Fire-retardant treated wood (pressure-treated, listed for exterior use, installed per listing)
  - One-hour fire-resistive construction
  - Alternative decking materials passing the performance test requirements of State Fire Marshal standard 12-7A-4 and approved by the building official
- **Fences and other attachments:** Any portion of a fence or other structure less than five feet from any building shall be constructed of non-combustible material, pressure-treated exterior fire-retardant wood or meet the same fire-resistive standards as the exterior walls of the structure. The building official may allow vinyl fences when the construction conforms to guidance documents

The requirements above are minimums. Full scale testing conducted in 2022 identified several weaknesses in these adopted standards. Appendix A provides the most up-to-date ignition resistant construction features and is preferred. It may also be used as an AMM.

### **ACCESS AND EGRESS, EVACUATION PLANS, TEMPORARY SHELTER-IN-PLACE**

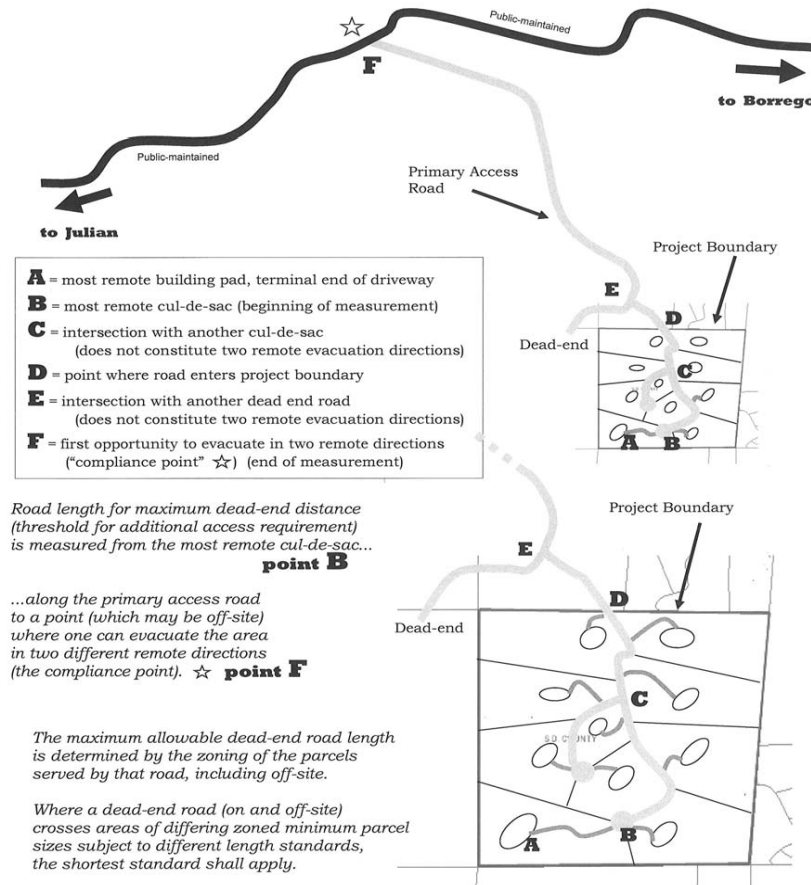
The analysis must include a description of the existing off-site and proposed on-site road network, including the following:

- Main/additional access
- Road widths, angles of approaches/departures, obstructions (gates), fire lane marking and turnarounds, including analysis of off-site roads from a public-way and all deviations from fire code requirements
- The maximum length of a dead-end roadways, including all dead-end roads accessed from that dead-end roadway, shall not exceed the cumulative lengths in Figure 5, regardless of the number of parcels served (Consolidated Fire Code Section 503).
  - Road length is measured from the beginning of the primary access road at a point where one can evacuate in two different directions (which may be off-site), measured to the end of the most remote cul-de-sac. Refer to Figure 6 for guidance on measuring dead-end roadway length.
  - Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply. Where parcels are zoned 5 acres or larger, turnarounds shall be provided at a maximum of 1,320 foot intervals. Each dead-end road shall have a turnaround approved by the fire code official and constructed at its terminus.
- Road grades and surface improvements
- On-going road maintenance (identify entity responsible and private funding mechanism)

**Figure 5: Maximum Length of Dead-End Roadways**

<b>Zoning for Parcel Served by Dead End Road(s)</b>	<b>Cumulative length of Dead End Road(s)</b>
Parcels zoned for less than 1 acre	800 feet
Parcels zoned for 1 acre to 4.99 acres	1320 feet
Parcels zoned for 5 acres to 19.99 acres	2640 feet
Parcels zoned for 20 acres or larger	5280 feet

**FIGURE 6: Length of Dead End Roads**



The intent of limiting the allowable length of a dead-end road is to ensure that firefighters have access flexibility to deal with changing dynamics in wildfires and other emergencies, and that civilians have safe, reliable, and known evacuation alternatives during emergencies.

Dead-end road regulations also assist in limiting the number of persons attempting to evacuate on the road and to limit the time needed for safe evacuation. Steep, narrow, and winding roads delay evacuation. Long dead-end roads in rural wildland areas place people and emergency personnel at increased risk.

Projects with an access road that exceeds the regulations for dead-end roads should first consider providing an alternate means of access and egress before resorting to other possible alternatives. One acceptable AMM is to limit the number of homes accessed from that road as follows:

- 50 dwelling units where the restriction is designed to be permanent and the street or street system does not traverse a wildland area which is subject to hazard from brush or forest fire;

- 75 dwelling units where the restriction is designed to be permanent and the street or street system traverses a wildland area which is subject to hazard from brush or forest fire;
- 300 dwelling units, where the restriction is subject to removal through future development.

If the roadway paving on that portion of the street or street system forming the restriction is less than 36 feet in width and is not to be widened to 36 feet or more as a part of the development of the division of land, the permitted number of dwelling units shall be reduced by 25 percent if the pavement is 28 feet or more in width, and by 50 percent if the pavement is less than 28 feet in width. If the roadway paving on that portion of the street or street system forming the restriction is 64 feet or more in width and the restriction is subject to removal through future development, the permitted number of dwelling units may be increased to 600. In no event shall the pavement width be less than 20 feet.

**The following conditions apply to roads serving new development:**

**Escape Routes:**

Routes shall be designated as the principal means of evacuation from new development. These roads may be existing or newly constructed. Escape routes must meet the following standards:

- a. At least two dispersed access routes shall be available for new development. (This condition may be waived for small projects by appeal to the Director, PDS). Additional routes may be required for larger developments.
- b. Escape routes shall meet San Diego County paved public road standards and be available for public access on a constant basis. ([https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/references/rtcref/ch3.1.8/2014-12-19\\_CountyofSanDiego2012\\_PublicRoadStandards.pdf](https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/references/rtcref/ch3.1.8/2014-12-19_CountyofSanDiego2012_PublicRoadStandards.pdf))
- c. Any gating on escape routes must be either constantly staffed or immediately openable by approaching vehicles. Any unstaffed gate shall have assured power supply in case of utility public safety shutoff or failure. Any gating shall have emergency vehicle access accommodation. Gates may not have semi-permanent locking devices affixed.
- d. Escape routes shall have continuous accessibility for incoming emergency response simultaneous to civilian evacuation use.
- e. Any traffic calming feature located in escape routes shall be designed so as to accommodate emergency fire apparatus and large truck traffic, and not hinder response times or delay emergency evacuation traffic flows.



- f. New development shall not detract from existing evacuation capacity or travel speeds of neighboring communities also using the same routes for evacuation. Traffic flow mitigation such as signaling, signage, additional traffic and turn lanes, center medians, or other installations may be considered for mitigation of traffic issues.
- g. Contra flow, or the use of all traffic lanes, both in and out bound, as a temporary means of single direction traffic flow shall not be used as the primary evacuation method. This is due to a history of loss of life and severe congestion occurrence in the early stages of wildfire evacuation during major California wildfires. This method will be reserved for law enforcement discretion only. (This method requires extensive law enforcement prioritization and commitment, and may be difficult to achieve when limited law enforcement resources are heavily engaged in simultaneous public contact, evacuation notification, and initial traffic control).

### **Evacuation Plans:**

- a. San Diego County policy in the Safety element, Chapter 7 (65302 (g) (5) adopted through SB 99 (2019) requires identification of specified evacuation constraints associated with residential developments). The CAG has also stated that the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq, requires detailed evacuation planning including timing, road capacity, impact to existing evacuation planning and routes, and traffic modeling. The project shall propose an evacuation plan those details emergency notification methods and procedure, mobilization, and complete community evacuation from wildfire risks. The plan shall include reliable routes of travel, the objective location of evacuations, and include both human and animal evacuation needs. Plans shall have a goal of evacuation of the community within 1-1.5 hours of public notification. Plans shall detail means and methods for infirmed or limited mobility populations such senior living facilities, or schools. The plan shall be consistent with the San Diego County Emergency Plan, Annex Q-Evacuation: [https://www.sandiegocounty.gov/content/dam/sdc/oes/emergency\\_management/plans/op-area-plan/2018/2018-Annex-Q-Evacuation.pdf](https://www.sandiegocounty.gov/content/dam/sdc/oes/emergency_management/plans/op-area-plan/2018/2018-Annex-Q-Evacuation.pdf)
- b. Areas of safe refuge shall be designated for planned evacuations and shall be the objective of travel by designated escape routes. Evacuation plans shall describe any fire entrapment risks that evacuees may encounter in travels to safe refuge. (The project may be required to conduct mitigation of all or portions of these travel risks, as determined by the FAHJ or Director, PDS. Distances of travel and travel times to safe refuge shall be described in the evacuation plan. Safe refuge shall include sites where evacuees are safe from proximal exposure to fire behavior or effects, and which may accommodate large assemblages of evacuees and associated relief response.
- c. The project shall detail in its FPP how the evacuation plan will be maintained and disseminated within the community.



### Temporary Shelter-in-Place

- a. The provision of temporary shelter in place within a community is driven by the fact that in cases where the origin of a wildfire is close to the community, not enough time may be available for safe evacuation, or, some residents may elect to not evacuate until it is no longer safe to do so. While evacuation will remain the primary means of public protection, accommodation for temporary safe within the community must also be developed and stated in the development's FPP.
- b. Temporary Shelter-in-Place may occur at locations that offer separation from wildfire effects. These may include school yards, parking lots, landscaped parks of reasonable size, commercial centers, golf courses, ball fields, agricultural areas, community centers, churches, and similar sized facilities that have defensible space from wildfire, and safety within the site for temporary and significant public assemblage. Desirable characteristics for these sites include; immediately accessible to the public by foot or automobile, with opportunities for parking without creating traffic congestion, handicap accessible, pet or large animal accessible, and accessible for emergency responders to protect populations in-place. As an example, more than 8,000 residents who were unable to evacuate safely from the Camp Fire in 2018 in the Community of Paradise, CA took shelter in such sites and were protected in place by responding emergency services, surviving a wildfire that took 85 lives and burned 18,800 structures.
- c. Projects shall detail in the FPP the location, capacity, and potential use of temporary Shelter-In-Place sites within the development. Guidance should be provided in the evacuation plan as to when and under what conditions it will be safer to occupy these sites rather than evacuate. The project shall ensure that designated Shelter-in-Place sites are absent life-threatening wildfire conditions and harden the sites through distance (such as road widths or green belts), installation of walls, fuel modification, or similar installations, when necessary.

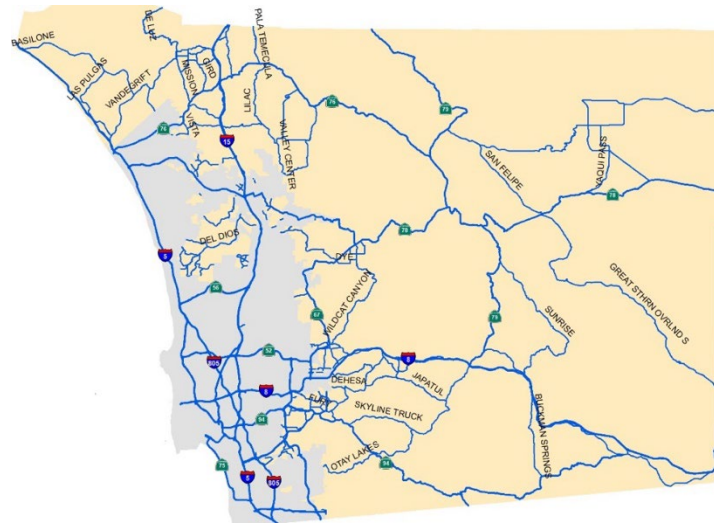
## TRAFFIC ENGINEERING, ROAD STANDARDS, AND CIRCULATION

### Traffic Engineering Study

A certified professional traffic engineer shall calculate traffic flows for emergency escape routes from the point of origin to safe refuge, and shall determine likely traffic speeds, impact to existing routes, impact of traffic calming features (if any time required for community evacuation, and recommend traffic engineering mitigations.

### Traffic Engineering, Road Standards and Circulation

*THE BALANCE OF THE SECTION IS RESERVED FOR FUTURE STUDY*

**FIGURE 7: Evacuation Routes**

- Major Roads & State Highways
- Unincorporated San Diego
- County Incorporated Cities

## **WATER REQUIREMENTS**

A water tank is required where a project is not within a water district or not within 1500 feet of a water district line that could be extended for hydrants. The minimum size of the tank required for fire suppression is based on total area of the buildings to be protected:

Up to 1500 sq. ft. = 5,000 gallons  
 Over 1500 sq. ft. = 10,000 gallons  
 Recommended= 20,000 gallons

This general rule applies in most circumstances. An increase in required water supply may be necessary depending on the size of the structure.

For development within water districts having fire hydrants proximal to proposed development, the project shall submit calculation of hydrant fire flows, fire flow duration, reservoir capacity, and disclose any pump stations or hydraulic lift required to provide fire flows to the subject development. A minimum of 2,500 GPM fire flow with a duration of 4-hours shall be the minimum provided, or supplemental water tanks will be required.

### **Residential Fire Sprinkler Requirement**

Residential fire sprinklers are required in conjunction with all new structures, regardless of use. Residential fire sprinklers are designed to protect occupants from fires that start inside the structure, giving them time to escape. They do prevent house fires from spreading to vegetation. They are not, however, intended to protect the home from wildfire (though there have been a few cases where radiant heat ignition of interior contents was stopped by a sprinkler). Far more people die in fires that start within dwellings than start anywhere else, including wildfires.

No recognized standard exists for fire sprinklers protecting the exterior of a home in a wildfire. Effective exterior building fire protection comes from non-combustible walls and eaves, restricted attic ventilation, class “A” roofs, fire-resistive decks, tempered dual-paned windows, fire-resistive doors – “defensible structures” – and from properly maintained vegetation – “defensible space”.

Note: Greenhouses enclosed with translucent plastic or glass and located 30 feet or more from other buildings and all property lines **or** free standing, open-sided shade covers, sheds, gazebos, and similar non habitable accessory structures with less than 250 square feet of projected roof area, no utility connections, and located 30 feet or more from other buildings and all property lines are exempt from ignition-resistant construction requirements.

## **VEGETATION MANAGEMENT**

The intent of vegetation management is to ensure all flammable vegetation or other combustible growth is managed to reduce the threat from wildfires. Reports on destructive fires contain common problem areas near structures, including:

- Overgrown or unmanaged vegetation
- Combustible mulches
- Woodpiles
- Trash and recycling receptacle storage locations
- Hazardous plants and vegetative debris
- Clustering of trees and shrubs

There are generally three levels of vegetation management: Community Fuel Modification (FM), Defensible Space around Structures (DS), and ornamental landscaping outside FM and DS zones.

### **Community Fuel Modification**

State Minimum Fire Safe Regulations, Title 14, requires “fuel breaks” for new developments. These are considered synonymous with community “fuel modification” zones, based on application. Specifically, Section 1276.03 states:

(a) When Building construction meets the following criteria the need and location for Fuel Breaks shall be determined in consultation with the Fire Authority:

- (1) the permitting or approval of three (3) or more new parcels, excluding lot line adjustments as specified in Government Code (GC) section 66412(d); or
- (2) an application for a change of zoning increasing zoning intensity or density; or
- (3) an application for a change in use permit increasing use intensity or density.

(b) Fuel Breaks shall be located, designed, and maintained in a condition that reduces the potential of damaging radiant and convective heat or ember exposure to Access routes, Buildings, or infrastructure within the Development.

(c) Fuel Breaks shall have, at a minimum, one point of entry for fire fighters and any Fire Apparatus. The specific number of entry points and entry requirements shall be determined by the Local Jurisdiction, in consultation with the Fire Authority.

(d) Fuel Breaks may be required at locations such as, but not limited to:

- (1) Directly adjacent to defensible space to reduce radiant and convective heat exposure, ember impacts, or support fire suppression tactics;
- (2) Directly adjacent to Roads to manage radiant and convective heat exposure or ember impacts, increase evacuation safety, or support fire suppression tactics;
- (3) Directly adjacent to a Hazardous Land Use to limit the spread of fire from such uses, reduce radiant and convective heat exposure, or support fire suppression tactics;
- (4) Strategically located along Ridgelines, in Greenbelts, or other locations to reduce radiant and convective heat exposure, ember impacts, or support community level fire suppression tactics.

(e) Fuel Breaks shall be completed prior to the commencement of any permitted construction.

(f) Fuel Breaks shall be constructed using the most ecologically and site appropriate treatment option, such as, but not limited to, prescribed burning, manual treatment, mechanical treatment, prescribed herbivory, and targeted ground application of herbicides.

(g) Maintenance mechanisms shall be established to ensure the fire behavior objectives and thresholds are maintained over time.

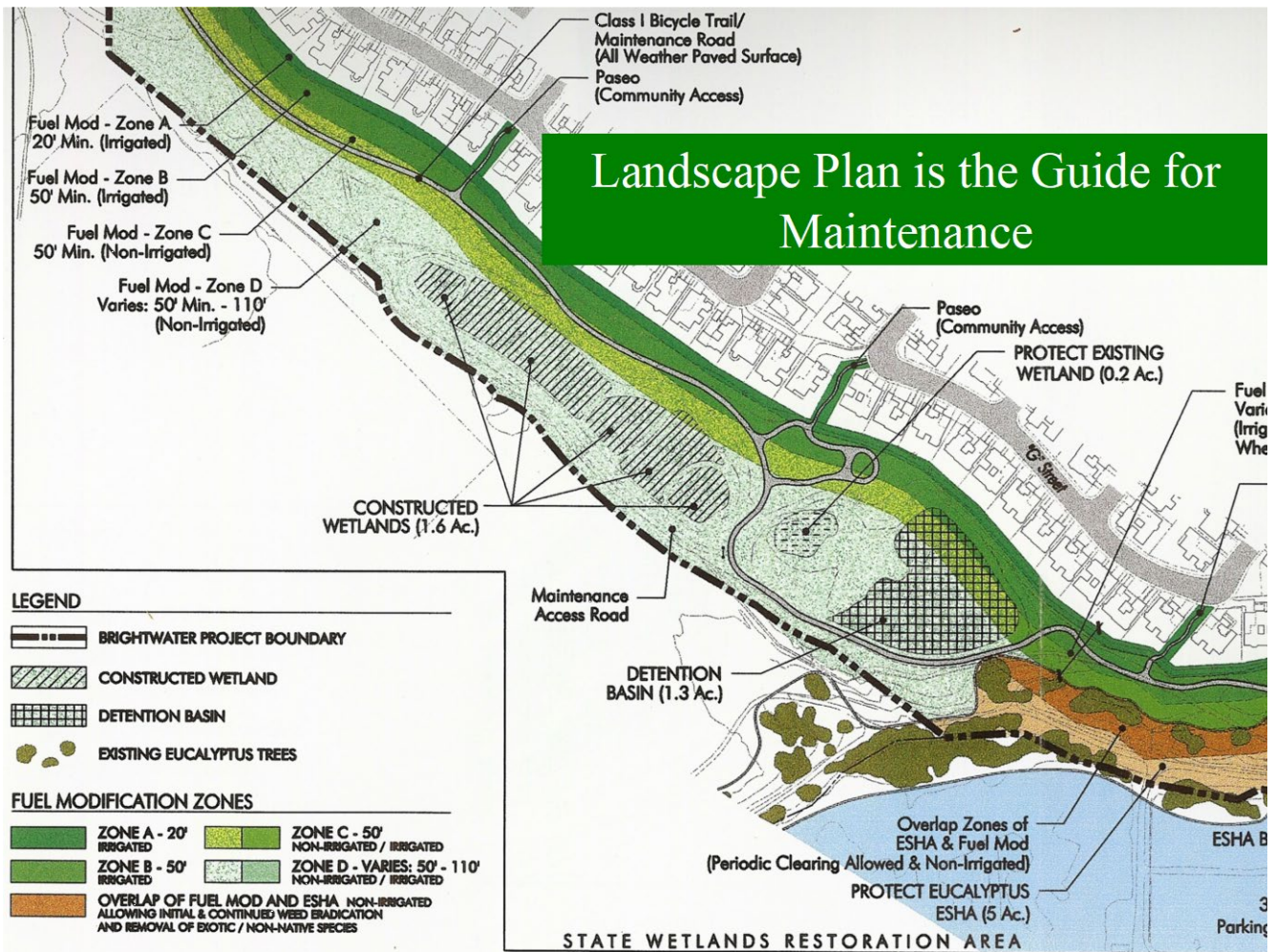
(h) The mechanisms required shall be binding upon the property for which the Fuel Break is established, shall ensure adequate maintenance levels, and may include written legal agreements; permanent fees, taxes, or assessments; assessments through a homeowners' association; or other funding mechanisms.

Fuel modification zones should be located to protect a community by reducing the fuel loads adjacent to *a community* and buildings within it. The width of zones shall be a minimum of 100 feet and may be wider based on the results of the fire modeling report. The developer shall assign the land on which any fuel modification zone is established to the association or other common owner group that succeeds the developer as the person responsible for common areas within the community.

Tracts and streets abutting the Wildland-Urban Interface must be considered "in-total" for their fuel modification requirement. In this case, structural fire defense will be evaluated by the FAHJ for protection of both individual structures and the exposed group of neighboring structures as a group.

Once a fuel modification zone has been established, the land on which the zone is located shall be under the control of an association or other common ownership established in perpetuity, for the benefit of the community to be protected.

**FIGURE 8: Sample Community Fuel Modification Plan**



### Defensible Space for Structures

The County Fire Code requires defensible space around every building that is designed primarily for human habitation or use, or a building designed specifically to house farm animals. Decks, sheds, gazebos, freestanding open-sided shade covers and similar accessory structures less than 250 square feet and 50 feet or more from a dwelling, and fences more than 5 feet from a dwelling, are not considered structures for the establishment of a fuel modification zone.

Consistent with state regulations, the required defensible space area is 100-feet around structures (or to the property line, whichever is nearer to the structure). This includes the following:



1. Zone 0 "Immediate Zone" 0-5' extends 5 feet on a horizontal plane from all exterior wall surfaces (and patios, decks or other attachments to buildings or structures). This zone shall be constructed of continuous hardscape or non-combustible materials (such as pavement, pavers, gravel, river rock, etc.). Combustible materials must be removed from this area (which includes but is not limited to removing combustible materials from roofs, gutters, decks, porches and stairways). Firewood and lumber are prohibited in this area. Dead branches that overhang roofs, are below or adjacent to windows, or which are adjacent to wall surfaces must be removed. All branches within ten (10) feet of any chimney or stovepipe outlet must be removed.
2. Zone 1 "Intermediate Zone" from Zone 0 to 50' extends from the immediate edge of Zone 0 for 45 feet on a horizontal plane. This zone shall consist of planting of low growth, drought tolerant and fire resistive plant species. The height of the plants in this zone starts at 6" adjacent to Zone 0 and extending in a linear fashion up to a maximum of 18" at intersection with Zone 2. Dead or dying grass, plants, shrubs, trees, branches, leaves, weeds, and pine needles must be removed from the area. Other combustible materials must not be adjacent to or under combustible decks, balconies, and stairs. Vegetation in this zone shall be irrigated and not exceed 6' in height and shall be moderate in nature as per Sec. 4907.6.4.1. Dead branches that overhang roofs, are below or adjacent to windows, or which are adjacent to wall surfaces must be removed. All branches within ten (10) feet of any chimney or stovepipe outlet must be removed.
3. Zone 2 "Extended Zone" from Zone 1 to 100' extends from the immediate edge of Zone 1 for 50 feet on a horizontal plane. This zone consists of planting of drought tolerant and fire resistive plant species of moderate height. This area would be considered selective clearing of natural vegetation and dense chaparral by removing a minimum 50% of the square footage of this area. Horizontal and vertical spacing among shrubs and trees must be created using fuel separation, as follows: Dead and dying woody surface fuel and trees shall be removed. Loose surface litter (consisting of fallen leaves or needles, twigs, bark, cones, and small branches) shall be permitted to a maximum depth of three (3) inches. Annual grasses and forbs must be cut down to a maximum height of four (4) inches.

The area located within 50-feet of the structure must be cleared and planted with fire-resistant plants, and the landscaping must be irrigated. In the area between 50 to 100 feet around structures the native vegetation may remain but must be thinned by 50% and all dead and dying vegetation must be removed. In this area, grass and other vegetation less than 18 inches in height above the ground need not be removed where necessary to stabilize the soil and prevent erosion. The area between 0 and 5 feet from the structure shall be free of combustible materials.

Trees are allowed in the 100-foot defensible space area. The crowns of trees shall be a minimum of 10 feet from structures and the crowns of other trees and shall be pruned to remove limbs located less than 6 feet above the ground surface.

Defensible Space zones may, in selected circumstances, be required to be larger than 100 feet. These circumstances usually involve proximity of development to steep, elongated slopes and/or heavy fuels that are subject to extreme fire behavior. Such a determination shall be made by the FAHJ.

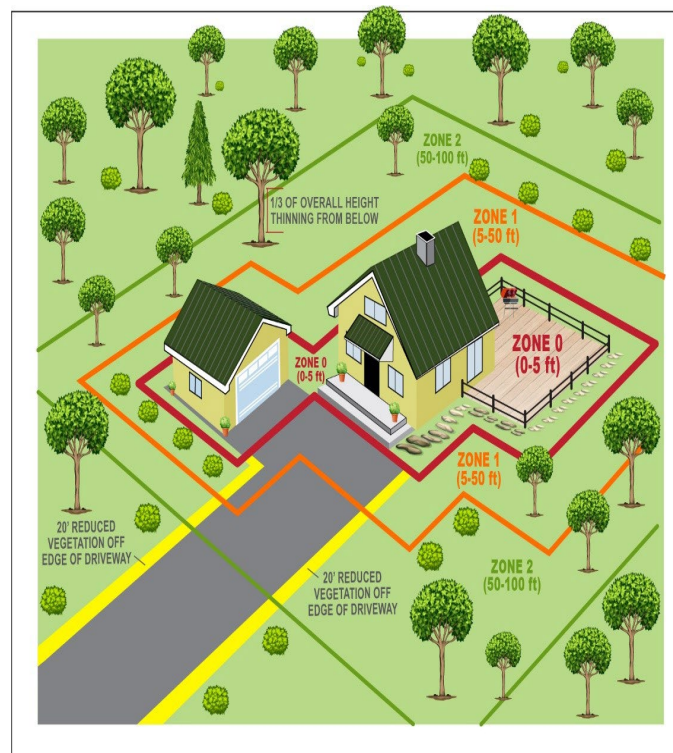
For more information on creating defensible space around homes and guidance regarding suggested ornamental planting material see the following guideline:

[https://www.sandiegocounty.gov/pds/fire\\_resistant.html](https://www.sandiegocounty.gov/pds/fire_resistant.html)

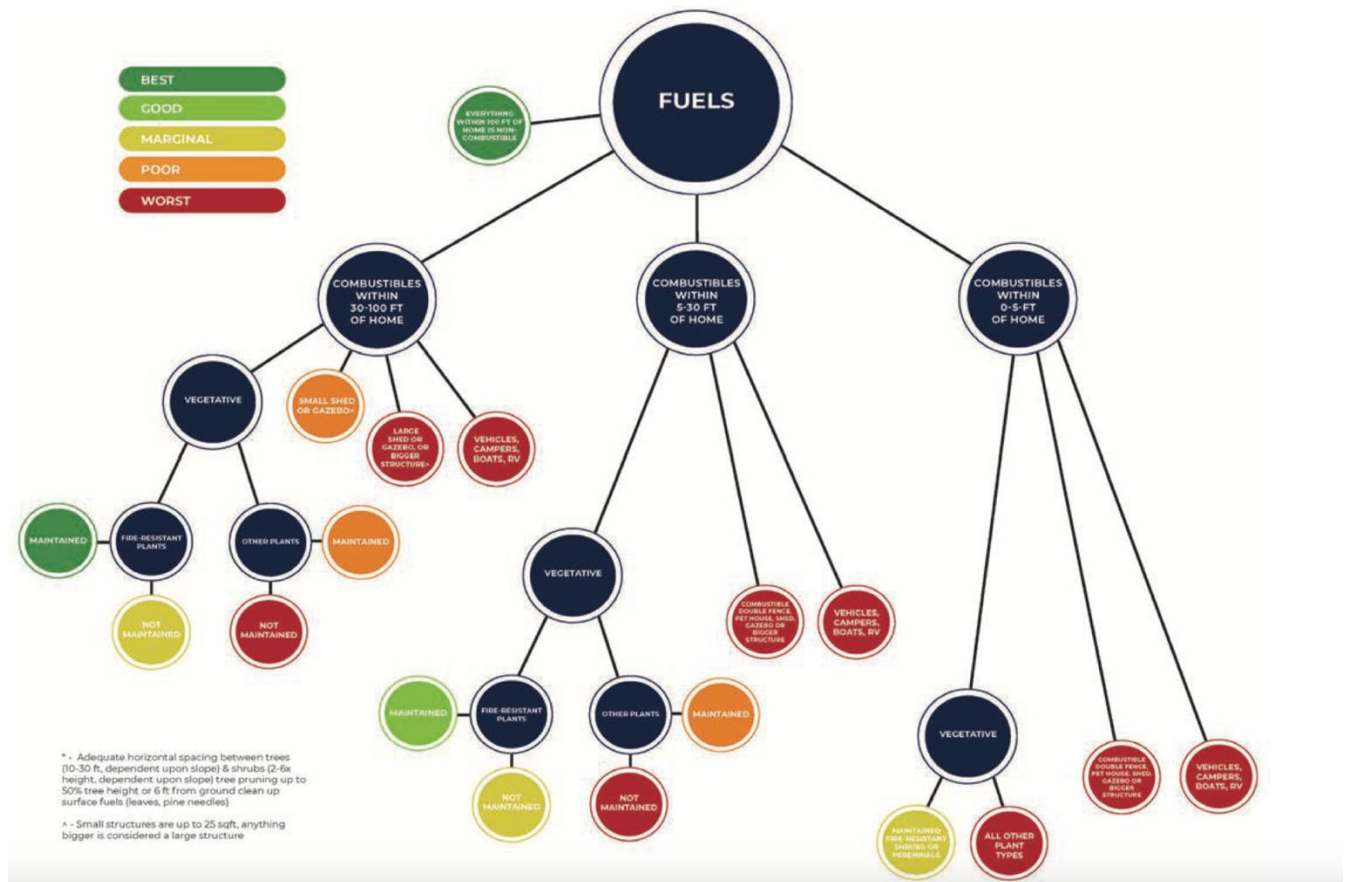
Combustible vegetation can only be removed by mowing, cutting and grazing as long as the root structure is left intact. Any trees you remove shall have the stumps cut no higher than 8 inches above the ground. The only exception would be an orchard. Orchard trees may have their stumps completely removed. Commitment to maintenance standards and responsibilities will be required for approval of fuel modification plans.

If an open space easement is located on the property, you may legally clear the 100-foot from your structure, even if it takes you into that easement, upon written authorization of your fire protection district. No irrigated, or non-native landscaping is allowed within an open space easement.

**FIGURE 9: Defensible Space Zones**



**FIGURE 10: Defensible Space Guidance for Fuels**



**Location of Structures on Lots**

Defensible Space is necessary for the life of the building. Fuel modification on neighboring property is not authorized by the County Fire Code. The defensible spaces zone may not extend beyond the lot being developed. Agreements with neighbors, while desirable, cannot be depended on; ownership and cooperation can change. Therefore, it is critical that the fire code regulate the minimum distance from structure to property line.

Where adequate setback distance is possible, the structure shall be located such that 100-foot fuel modification can be obtained on the property. This setback is particularly important where vegetation management is restricted such as an Open Space Easement or a where vegetation management may not take place (e.g. riparian areas, state or federal land.)

The absolute minimum setback is 30 feet. If the fire authority having jurisdiction [FAHJ], the planning authority having jurisdiction [PAHJ] and the County Fire Marshal identify the hazard in the area as “minimal”, they may allow less than 30 feet setback. When parcels are adjacent to national forest, state park or open space preserve, buildings and structures must be located a minimum of 100 feet from the property line adjacent the protected area.



## Roadways

The FAHJ may require a property owner to modify combustible vegetation in the area within 20 feet from each side of the driveway or a public or private road adjacent to the property to establish a fuel modification zone.

## Plants and Ornamental Landscaping

Specific plant types should be selected based on fire-resistance. Also be aware of plants to avoid. Invasive plants can have a higher potential for ignition than native vegetation because they often produce more flashy fuels which ignite and burn quickly. However, native vegetation can also be highly flammable. Common characteristics of prohibited plants include volatile resins and oils, generally aromatic when crushed (e.g., eucalyptus), narrow leaves or long, thin needles, waxy or fuzzy leaf, accumulates dead leaf and twigs on and/or under the plant (e.g., Italian Cypress), loose or papery bark, invasive species.

All new vegetation shall be *drought tolerant* and fire-resistant vegetation in accordance with the County Fire Code which also has height and spacing requirements for shrubs and trees. Characteristics of “fire-adapted” plants include: Drought-resistant, pest-resistant, native to area, noninvasive, slow-growing, wind-resistant, sustainable without supplemental fertilization. The following planting guidelines must be followed:

- Shrubs limited to 6' in height.
- Grouping of shrubs limited to a maximum aggregate diameter of 10'.
- Separation of shrub groupings of a least 15'.
- Separation of groupings from structure of at least 30'.
- Shrubs located below or within a tree drip line shall be separated from the lowest tree branch by a minimum of three times the height of the understory shrubs or 10 feet, whichever is greater.
- Tree driplines must be maintained at not less than 10 feet from any combustible structure.
- The horizontal distance between tree crowns must be not less than 10 feet.

All ornamental landscaping must also be consistent with County's Landscape Ordinance and Landscape Design Manual. Projects requiring landscape plans should clearly identify the type of plant materials, locations and spacing of plant materials, and irrigated and non-irrigated landscaping. The landscape consultant may recommend in the text the inclusion or exclusion of specific varieties for review by the County landscape architect.

In addition to initial vegetation and landscape planning, ongoing vegetation management and maintenance is crucial. This includes all areas with vegetation in the development—both heavily landscaped open spaces and those dominated by native vegetation. Regular fire mitigation over the long-term should be required or performed.

Combustible vegetation can only be removed by mowing, cutting and grazing as long as the root structure is left intact. Use the San Diego County guidelines on acceptable and unacceptable plants. The building official and the FAHJ may provide lists of prohibited and recommended plants.

### **Plans**

Landscape plans shall be provided to the FAHJ or a designated third party for any new construction and or addition for residential and commercial buildings or accessory thereof. Plans shall be submitted and approved prior to any framing inspection. In addition, plans shall be provided when modifications occur to any previously approved landscape plan or to the Home Ignition Zones.

Plans shall be prepared by a California Licensed Landscape Architect, Architect, or Civil Engineer. A landscape designer could prepare planting plans only (not irrigation) for a single-family residence but would need one of the above professionals to stamp the plans verifying compliance with the regulations. Plans shall include:

1. A readable (Engineer or Architect) scale.
2. Delineation of Fuel Modification Zones and Defensible Space/Home Ignition Zones with a general description of zone dimensions and character.
3. Describe and show existing vegetation on plan.
4. Include a Plant Legend with the plant-life form, scientific and common name, and expected height and width for mature growth.
5. Describe vegetation reduction around emergency access and evacuation routes.
6. Include quantities of trees and large shrubs being proposed.
7. Identify irrigated and non-irrigated areas on the plan.
8. Identify points of access for equipment and personnel to maintain vegetation.
9. Define all symbols, site amenities, features, and shaded areas, etc. used on the plans.
10. Legally binding statements regarding community responsibility for fuel modification zones
11. Legally binding statements to be included in covenants, conditions, and restriction regarding property owner's responsibilities for vegetation maintenance.

### **PROTECTION OF CRITICAL INFRASTRUCTURE**

Communities rely on robust electric, water delivery, and telecommunications systems during emergencies. Power is required to receive emergency messaging, provide lighting, and to operate water delivery systems. Telecommunications systems such as telephone and cable services deliver critical emergency messaging, and digital operating coding for infrastructure. Water systems and delivery are critical for firefighting. Loss of these systems can contribute to loss of life and property.

Critical infrastructure protection (access/egress routes, communication systems, water supplies/infrastructure, electrical power infrastructure) from wildfire hazards, as well as limiting the potential sources of wildfire ignitions due to some of these features, is an important planning consideration where relevant to a new development or subdivision.

- a. Discuss fire hardening of roadways, water, telecommunications, and electrical distribution, storage, node, and transfer facilities against wildfire damage or wildfire ignition
- b. Discuss critical infrastructure maintenance responsibility, and fire defense methods, mitigations, and maintenance frequency to be undertaken by responsible parties
- c. Discuss operating power resiliency for critical infrastructure to protect against domestic power supply loss. A minimum of 4 hours of power should be available.

The project shall also detail any proposed utilization of solar, wind, battery, or related green technologies, their siting within the project, and proposed fire risk mitigations.

### **Electrical**

Where possible, place all electrical distribution equipment in conduit underground. Where underground distribution equipment is infeasible, consult any relevant fire safety ordinances for adequately designing overhead electrical distribution lines and associated equipment (e.g., transformers) to reduce the likelihood of this equipment providing a source for wildfire ignitions. Consideration should be given not only to the hardening of the equipment, but also in providing adequate vegetation clearance, appropriate plant selection such that fall-in, grown-in and lean-in of vegetation is minimized, and long-term management.

### **Fuel**

Fuel tanks (e.g., propane) can present a significant hazard to both structures and first responders if they start off-gassing or explode during a wildfire. Exposed, fuel lines can also be vulnerable to wildfire damage (see NFPA 58). Bury or shield fuel lines to protect them from the effects of radiation, direct flaming, and ember exposure. Bury pressurized fuel-storage vessels underground, where possible. Where fuel storage tanks are stored or installed above ground, the following guidance should be considered:

- Install tanks a minimum of 30 feet from habitable structures.
- For cylindrical tanks, use vertical tank or orient horizontal tanks so that the circular ends are pointed away from residences or structures since the ends are weaker than the tank body.
- Install tanks on and surrounded by noncombustible surface.
- Provide a noncombustible masonry wall enclosure, where possible
- Avoid installing tanks near high-risk topographic features (e.g., steep slopes, drainages)

- Maintain at least 10 feet of clearance from other combustibles.
- Avoid installing tanks in proximity to primary or secondary egress routes.
- Ensure pressurized storage tanks have a pressure-relief valve and that the valve/vent is directed away from residences and structures.
- Provide signage or other form of notification of type and location of fuel-related utilities, where concealed or inconspicuous.
- Critical fire-protection equipment (e.g., water tanks, water supply pumps, pump houses) may necessitate fire-hazard reduction measures to protect this infrastructure from being damaged or lost during a wildfire incident.

### **Communication Towers & Renewable Energy Installation**

Consider providing 30 feet of hardscaping or brush clearance around communication towers and associated equipment. Consult with local fire authorities for any local requirements, guidance, and best practices. Where no local guidance is provided, consult NFPA 1, NFPA 1140 or IWUIC.

NFPA 1 recommends a noncombustible base and clear area of 10' around ground-mounted photovoltaic installations.

### **Water**

Water supply and water storage, including on-site storage, are components of critical infrastructure within a development.

The reliability of water storage and pumping facilities must be protected from wildfire. At a minimum, 30 feet of brush clearance should be maintained around critical fire protection equipment.

### **Essential Facilities/Community Refuges**

Construct fire-resistant public facilities and create community refuges to provide safety for vulnerable populations and last-resort options for worst-case scenarios. Schools, nursing homes, hospitals on interior and ignition resistant. Different than “safety zones” which are typically large open areas sized based on vegetation height, slope steepness, and winds.

## **EMERGENCY SERVICES**

Fire protection and emergency medical/rescue services are among the most vital and basic of community needs. Firefighters, who are generally the first responders to disasters, must be prepared to respond quickly and effectively to all types of emergencies, including wildland fires. For this reason, the provision of adequate facilities for fire protection and emergency services is fundamental to protecting the health, safety and general welfare of the residents of San Diego County. The following chart from the Safety Element of the San Diego County General Plan provides maximum travel times.

**FIGURE 11: \*Travel Time Standards from the Closest Fire Station**

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> <li>■ Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1)</li> <li>■ Commercial and Industrial Designations in the Village Regional Category</li> <li>■ Development located within a Village Boundary</li> </ul>	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	<ul style="list-style-type: none"> <li>■ Semi-Rural Residential Areas (&gt; SR-1 and SR-2 and SR-4)</li> <li>■ Commercial and Industrial Designations in the Semi-Rural Regional Category</li> <li>■ Development located within a Rural Village Boundary</li> </ul>	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	<ul style="list-style-type: none"> <li>■ Limited Semi-Rural Residential areas (&gt;SR-4, SR-10) and Rural Lands (RL-20)</li> <li>■ All Commercial and Industrial Designations in the Rural Lands Regional Category</li> </ul>	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.
>20 min	<ul style="list-style-type: none"> <li>■ Very-low rural land densities (RL-40 and RL-80)</li> </ul>	number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.

\* The most restrictive standard will apply when the density, regional category and/or village/rural village boundary do not yield a consistent response time standard.

\*\* Travel time standards do not guarantee a specific level of service or response time from fire and emergency services. Level of service is determined by the funding and resources available to the responding entity.

### Fire Agency Having Jurisdiction (FAHJ)

The following agencies provide fire services to non-Federal lands of San Diego County. Projects will need to confirm which agency provides emergency services to their proposed project to determine appropriate application of fire and building code, and to determine who will serve the proposed project area. **Highlighted agencies are those who enforce the County Consolidated Fire Code.** Project applicants need to contact the appropriate FAHJ for project processing. If the agency serving the project is not highlighted on this list, contact them for specific instructions regarding development of the FPP.

- **Alpine Fire Protection District**
- **Bonita-Sunnyside Fire Protection District**
- **Borrego Springs Fire Protection District** (Recently dissolved, now part of the San Diego County FPD)
- **CAL FIRE- San Diego Unit** (Cooperative fire protection with the San Diego County FPD)
- Carlsbad Fire Department
- Chula Vista Fire Department
- **Deer Springs Fire Protection District** (Served by the San Diego County FPD)
- Del Mar Fire Department

- Encinitas Fire Department
- Escondido Fire Department
- Heartland Fire and Rescue (Serving the Cities of El Cajon, La Mesa, and Lemon Grove)
- Imperial Beach Fire Department
- **Lakeside Fire Protection District**
- National City Fire Department
- North County Fire Protection District (Serving the unincorporated communities of Fallbrook, Bonsall, Rainbow, Pala Mesa, De Luz, and Winterwarm)
- Oceanside Fire Department
- Poway Fire Department
- **Ramona Municipal Water District** (Unincorporated community of Ramona fire services provided by the San Diego County FPD )
- **Rancho Santa Fe Fire Protection District** (including communities of Elfin Forest and Harmony Grove)
- **Rincon Del Diablo Fire Protection District** (Served by City of Escondido FD)
- San Diego City Fire-Rescue Department
- **San Diego County Fire Protection District** (Contract staffed by CAL FIRE, serving County unincorporated area and the Deer Springs FPD, Ramona Municipal Water Dist., and former Borrego Springs FPD)
- **San Marcos Fire Department**
- **San Miguel Fire Protection District** (Serving unincorporated communities of Bostonia, Casa De Oro, Crest, Grossmont/Mt. Helix, La Presa, Rancho San Diego, Spring Valley, and Cities of El Cajon and La Mesa unincorporated area)
- Santee Fire Department
- Solana Beach Fire Department
- **Valley Center Fire Protection District**
- **Vista Fire Protection District**

#### Fire Departments Serving Tribal Lands

- Barona Fire Department
- Campo Reservation Fire Protection District
- La Jolla Reservation Fire Department
- Pala Fire Department
- Pauma Fire Department
- Rincon Fire Department
- San Pasqual Reservation Fire Department
- Sycuan Fire Department
- Viejas Fire Department

### **Services Analysis and Assessment**

Proposed development shall detail the ability of current emergency services to meet both fire and emergency medical demand for the proposed development area. This appraisal shall summarize available fire/rescue/medical station locations, assigned apparatus types, facility and apparatus age and condition, staffing, response times to the project site, currently assigned mission (wildland or structural), and annual call capacity/demand.

The project will need to consult with the FAHJ to determine these conditions. The results of this evaluation shall be summarized in the project's FPP. Should the appraisal determine insufficiencies to serve the proposed project in comparison with this standard, the project must work with the FAHJ to determine appropriate mitigations. Adopted mitigations shall be approved by the Director, Land Use and Planning and adopted into development agreements.

Specifically, the analysis shall:

- a. Identify the five closest fire stations available for response
- b. Identify the apparatus and staffing assigned to these stations
- c. Ascertain the mission of these stations and availability for response to the development's demand
- d. Determine the response time of these stations to the development site
- e. Determine the age and condition of fire station facilities and apparatus
- f. Determine the availability, number, and location of paramedics and ambulances
- g. Determine the call and service demands of the development and contrast to available emergency services
- h. Propose mitigations related to fire service provision of service to the development, if any

### **Travel Time Standards**

Projects must comply with the emergency travel time requirements specified in the County General Plan. Travel time is defined as the estimated time it will take for a responding agency to reach the furthest structure in a proposed development project. Travel time is determined by measuring the safest, most direct, appropriate and reliable route between the fire station(s) and the project with consideration given to safe operating speeds for heavy fire apparatus. Travel time does not include alarm activation, reflex or reaction time, or on-scene size-up and set-up prior to attacking the fire, all of which are critical precursors to actual firefighting. Travel time may be calculated by using NFPA 1142 Table C.11(b), SANDAG layering, PDS-GIS software travel time mapping, actual emergency travel time run data or actual driving tests. If the travel time determined in the FPP is less than the travel time determined by the FAHJ, the travel time determined by the FAHJ shall take precedence.

Stations that are seasonal (not open all year), have strictly a wildland fire protection mission, or staffed with volunteers without legal responsibility to respond to emergencies, should not be used for determining consistency with travel time requirements of the County General Plan.



### Difference in Fire/Rescue Apparatus Types

When evaluating staffing and fire apparatus availability vs. new development service needs, it is important to identify the type of fire apparatus currently available in the project area. In urban/suburban areas, larger structural fire engines are needed to provide the types of firefighting equipment, hose, ladders, and pumping capacity necessary for fire suppression in structures. These engines are typically referred to as “Type 1 Engine Companies”. Additionally, larger apparatus which primarily carry ladders, salvage, smoke management, and heavy rescue equipment are referred to as “Truck Companies”. Engines are generally available at most fire stations while Trucks are needed more regionally and are placed about every third fire station. These types of fire apparatus are the principal means for provision of structural fire response.

Wildland fire engines (frequently referred to as “Type 3 Engines Companies”), are typically all that may be available at rural fire stations. While these smaller units can assist in structural fire attack, they are principally configured for the wildland mission and are absent the full complement of needed tools and capability for the structural fire mission. While they will be counted upon as part of a contingent for rural response, the need for structural fire response may require structural equipment be added to nearby fire stations to meet new development needs, or new stations with structural fire apparatus created to serve a project specifically.

With regard to emergency medical response, the availability of Paramedic and Ambulance services are critical to this mission. Projects must also detail emergency medical resources available or needed to serve new project demand. In San Diego County, Paramedic services are frequently cross-staffed with engine company staffing.

The San Diego County Fire Protection District has established Fire and Medical Emergency Response time standards utilizing four regional categories identified by land use designation and population density: Urban, Rural, Outlying, and some hard to serve area or extreme outlying areas are defined as Desert. These Regional Categories are consistent with the San Diego County General Plan for Safety definition for travel time standards for fire protection services. (For projects served by other FAHJ, projects should confirm that these standards specifically apply). The goal of County fire services is to meet or exceed the response standards 80% of the time.

REGIONAL CATEGORY	POPULATION PER SQ. MILE	RESIDENTIAL PROPERTIES	DESCRIPTION
URBAN	> 2000	3-20+ DUAC	Village Designation, Residential, Commercial, Industrial
RURAL	500 -2000	1-2 DUAC	Semi-Rural Designation, 2 Acre Residential, Light Commercial, Agriculture



OUTLYING	< 500	< 1 DUAC	Rural Designation, 10 Acre Lots, Open Space, Agriculture, Tourism
DESERT	Very few, transient	< 1 DU40AC	Hard to Serve Areas, Recreational Areas, Seasonal Fluctuations, Open Space, Public Lands

Proposed development projects should first be evaluated for their applicable “regional category”, then further evaluated as to whether emergency services available for the area of proposed development currently meets the FAHJ Standards of Cover. The project will need to work with the FAHJ to determine the service capabilities at fire stations near the proposed development. A list of Fire Stations of the San Diego County Fire Protection District may be found at : <https://www.sandiegocounty.gov/content/sdc/sdcfa/sdcfa/fire-stations.html>

For emergency medical incidents, response may be provided by a mix of paramedic, emergency medical technical, and basic first aid capable responders assigned to various fire apparatus, rescue units, and ambulances. Paramedic level of care is the highest level of field medical response and is provided to all areas of San Diego County. Projects should work with the FAHJ and evaluate available and needed levels of emergency medical service for the area of proposed development.

A response time study for fire/emergency medical response should be conducted for current services to determine services delivery to the proposed project. This appraisal must include response times, apparatus types, staffing, mission of the available resources (wildland, structural, etc.), and current annual call capacity and demand. Appraisal results should be completed for engine and truck companies, paramedic and ambulance service, and summarized in the project’s FPP.

After determination of currently available resources, a comparison should be conducted to determine response times to the proposed project. Within the jurisdiction of the San Diego County Fire Protection District, the response time standard is for fire and emergency medical response is:

<b>FIRE DEPARTMENT FIRST DUE RESPONSE STANDARD</b>				
<b>Fire and Emergency Medical Response</b>				
RESPONSE CATEGORY	CALL PROCESSING TIME	STATION ALERTING AND TURNOUT TIME	TRAVEL TIME	TOTAL RESPONSE TIME
URBAN	1:20	1:40	5:00	<b>08:00</b>
RURAL	1:20	1:40	10:00	<b>13:00</b>
OUTLYING	1:20	1:40	20:00	<b>23:00</b>

DESERT	1:20	1:40	45:00	<b>48:00</b>
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<b>TRUCK / RESCUE COMPANY RESPONSE STANDARD</b> *Where Truck service has been implemented				
RESPONSE CATEGORY	CALL PROCESSING TIME	STATION ALERTING AND TURNOUT TIME	TRAVEL TIME	TOTAL RESPONSE TIME
URBAN	1:20	1:40	8:00	<b>11:00</b>
RURAL	1:20	1:40	16:00	<b>19:00</b>
OUTLYING	1:20	1:40	30:00	<b>33:00</b>

### Multiple Station Response

Response to fires within structures and other complex calls typically requires response from multiple fire stations to achieve minimum staffing requirements as detailed by the California Occupational Safety and Health Administration, the County General Plan, and County fire organization policy. These standards also require a mix of fire apparatus types and staffing to respond to reported structure fire within a prescribed minimum time frame. This standard for the San Diego County Fire Protection District is as follows: (Projects served by other FAHJ shall confirm the project meets that agency's Standard of Cover)

<b>TOTAL FULL ALARM RESPONSE STANDARD</b>				
RESPONSE CATEGORY	FIRST DUE ENGINE	FIRST DUE TRUCK	TOTAL PERSONNEL	TOTAL TIME FOR ENTIRE RESPONSE TO ARRIVE
URBAN	08:00	11:00	19	<b>19:00</b>
RURAL	12:00	19:00	13	<b>30:00</b>
OUTLYING	23:00	33:00	10	<b>51:00</b>

Minimum staffing for fire apparatus detailed in this standard as follows:

- Type 1 Structural fire engines: 3 firefighters (at least one being a Paramedic)
- Truck companies: 4 firefighters
- Miscellaneous and support apparatus at the discretion of the FAHJ

### Project's Call Demand

When calculating the potential emergency service demand created by new development, The San Diego County formula for new call demand is as follows:

- 2.5 emergency calls per day for every 1,000 new residents, or per 250,000 square feet of new commercial development. (Smaller developments may prorate this projected call volume according to project size).

### **Extraordinary Fire Risk**

The FPP shall detail any existing or proposed use involving high risk occurring within 1 mile of the project perimeter that may impact local fire services delivery, cause extraordinary risk during wildfires, or affect evacuations. (examples: any storage or processing of explosives or explosively reactive materials, bulk hazardous materials, hazardous industrial processes, or facilities of large public use or assemblage).

### **Emergency Service Mitigations**

If emergency services analysis determines that current response times or service demands are exceeded, or service delivery factors required for new development are not met by existing emergency services, the Director of PDS may, upon concurrence with the FAHJ, accept mitigation measures. Acceptable mitigation may include, but is not limited to:

- Alternative construction methods and measures not otherwise required;
- Automatic Aid agreement(s);
- Upgrading existing fire station facilities or infrastructure;
- Constructing new fire station facilities; or
- Implementing a long-term binding agreement aimed at reducing the response time to acceptable limits
- Adding fire or medical staffing
- Adding new fire or medical apparatus

County policy S-7-2 through 4 (San Diego County Safety Element, Chapter 7) requires development to contribute its fair share towards funding the provision of appropriate fire and medical services as determined necessary to adequately serve the project. The policy further requires that new development demonstrate that adequate fire services can be provided that meet the minimum staffing and personnel, and that meet the minimum travel times identified (see travel time standards), and that fire protection staffing, facilities, and equipment required to serve the development are operating prior to, or in conjunction with, the development.

If a modification is proposed, the requirements of the County Consolidated Fire Code specific to modifications apply. Documentation of mitigation should appear not only in the FPP, but also in the files of the FAHJ as prescribed in the Fire Code. Failure to mitigate emergency services deficiencies may result in a court finding of project violation of the California Environmental Quality Act.

### Mitigation Driven Timing and Costs

The project proponent must propose a schedule for FAHJ acceptance that implements acceptable emergency services mitigations prior to delivery of the 150<sup>th</sup> occupancy permit in a development. Smaller developments may negotiate with the FAHJ regarding the phasing of mitigations. Costs for required mitigation shall be borne by the project/new development. In some cases, mitigations are expected to exist in perpetuity. Examples of these may include new fire station staffing or operation. Frequently, initial property tax revenue is insufficient during the early phases of tract occupancy to fully fund significant mitigations such as new fire stations, however FAHJ's must staff to meet project created risks before tax revenues cover costs. If new development property tax revenue is insufficient to fully support required mitigations, the project may be responsible for additional mitigation financial support until property tax for the service area becomes reliably sufficient. The FAHJ shall notify the project when such a condition applies and will negotiate with the project proponent for appropriate mitigation delivery and compliance.

### WILDFIRE BEHAVIOR ASSESSMENT

A summary narrative of wildfire behavior must be included within the FPP. This short narrative should include discussion of wind, spotting potential, fire trajectory, fuel beds, topographical influences, and major fire history for the site and nearby areas. In addition, a more technically detailed Fire Behavior Model should be completed for the project area in accordance with the requirements listed below. The Fire Behavior Report is a tool for fire authorities to estimate the behavior of fire that may threaten the proposed development and surrounding area. The Fire Behavior Report will be further reviewed by fire service experts with wildland expertise within FAHJ.

### Report

Requirements for inclusions within the fire behavior report include:

- A summary of fire behavior modeling results indicating what modeling methods were used, what inputs were calculated, and fire behavior output results.
- The identity and qualifications of the person completing the wildfire modeling, and their training and competency to complete and review wildfire modeling must be stated
- Modeling origins and trajectories must be specific to the development site and reflect average-worst-case wildfire behavior. The following criteria reflects the minimum number of wildfire trajectory projections required and size of the modeling sample
  1. Point-source modeling tools (Behave, et. al): At least 3 projections for every 640 acres/1 square mile, selecting runs that capture the worst-case geographic, vegetative, and wind exposure within the development and surrounding site.
  2. Landscape-scale modeling tools (Farsite, Flammap, Technoslyva etc.): At least one projection which incorporates the most likely average-worst-case fire behavior and spread for the majority of the development and surrounding site. (Site resolution, detail, and accuracy are higher in landscape models and they are the preferred source of data).
  3. Size of modeling area: The modeled site shall consider the entire development perimeter and surrounding vegetated area within 1-mile of the outer development perimeter.
- The following wildfire modeling results shall be reported:

1. Projected fireline intensity for the leading edge of the fire's trajectory, as expressed in "flame lengths". (Flame Lengths are measured from the average flame tip to the middle of the active flaming zone at the base of the fire. It is measured on a slant when the flames are tilted due to effects of wind and slope. It is highly indicative of fire line intensity and thermal output.
2. Average and maximum "Rate of Spread" for wildfires. Rate of Spread shall be expressed in feet-per-hour or miles-per-hour.
3. Spotting distance (distance of ember cast ahead of the fire front), expressed in feet/miles downwind.
4. Wind direction: Fire modeling shall be completed for the most Commonly experienced wind vector for the site, and a second model completed for Santa Ana wind conditions on the site. Wind vectors shall be stated by compass heading. (Example: NE, SSW, etc.)
5. Fuel Type: The types of fuels models used for modeling shall be reported using the National Surface Fuels Classification System (<https://www.nwcg.gov/publications/pms437/fuels/surface-fuel-model-descriptions>)
6. Slope: Modeled slopes shall be identified by location on a site map and include a description of steepness, in percent (%) slope.
7. Fuel Moisture: Model inputs shall include typical/average fuel conditions for San Diego County (Example for 10 hr. fuels: Live Fuel Moisture- 80% or less, Dead Fuel Moisture- fully cured and 6% or less).

### Technical Review

Given the complexity and variability of fire behavior, modeling is recommended to be completed, reviewed and interpreted by a certified Wildfire Behavior Analyst or GeoSpatial Analyst. To effectively use fire modeling, users must have enough fire experience and training in fire behavior to recognize if whether input values are appropriate, outputs are reasonable, and which adjustments are needed to correctly model the forecasted fire behavior.

- Typical average flame lengths; level terrain, mid-summer, San Diego County
  - Knee-High Grass: 4-8 feet
  - Tall Grass: 8-12 feet
  - Coastal Sage Scrub: 10-20 feet
  - Chaparral: 20-40 feet
  - Timber: (Yellow Pine species): 30-60 feet

Modeled Flame Length outputs are an important indicator of fire line intensity. The following chart details this relationship:

FIRELINE INTENSITY				
<i>Flame Length (ft.)</i>	<i>Energy Output- BTU/Ft/Sec.</i>	<i>Rate of Spread (Ft/Hr)</i>	<i>Rate of Spread (MPH)</i>	<i>Notes</i>
0-1'	0-3	0-132	<0.25	Campfire heat intensity
1-4'	3-145	132-330	<0.25	Large bonfire heat intensity

4-8'	145-578	330-1320	<0.25	Max. human skin exposure without injury
8-12'	578-1156	1320-3300	0.25-0.62	Radiant ignition of nearby combustibles possible
12-25'	1156-2891	3300-9900	0.62-1.87	Radiant ignition of nearby combustibles probable
25'+	2891+	9900+	1.87+	Very high wildfire intensity
25'-60'	2891+	15,840+	3.00+	Critical Rate of Spread Extreme fire behavior

\* Source: Fire Behavior Field Reference Guide, PMS 437, National Wildfire Coordinating Group

### Limitations

Some limitations exist within Fire Behavior Models, including the following:

1. Most models are unable to predict the behavior and continuity of wildfire once it significantly involves or moves into structural development or ornamental vegetation. Rates of spread for structural involvement in these cases will require professional fire expertise and judgement.
2. Older, point source models lose accuracy in predicting sustained extreme wildfire behavior moving through tree crowns. If crowning potential exists, more advanced fire behavior modeling may be required.
3. The effects of ember cast after development of high intensity wildfire is difficult to model due to the uptake and transport downwind of embers and burning material high into a thermal column. These materials are lifted by convection and frequently deposited at extended distance from the flaming front causing spot fires. (Accurate determination may require use of advanced fire modeling for more accurate prediction). Similar modeling difficulties exist for geographic aided spotting conditions, such as when wind-driven fire crosses ridgelines.
4. Significant structural ignition during a wildland-urban interface fire increases wildfire behavior and dynamics throughout the fire area due to increased energy release into the thermal column. (Accurate determination requires use of advanced fire modeling and fire expertise for accurate prediction).

### MODELING TOOLS

*A selected List of Wildfire Behavior Prediction Tools (others are available)*

Behave Plus	Windows based application available for non-licensed users. Creates a spot/point source origin basic forecast with an overall accuracy of +/- 15%. Outputs are achieved for a single line of fire trajectory. Versions may be downloaded for use on PC's, tablets, or cell phones.
FlamMap	A federal fire behavior prediction suite capable of complex fire behavior forecasting over time on a landscape scale basis. Highly accurate with a +/-

Farsite	1-3% accuracy. The system includes crown fire modeling capability. Requires a license and certification as a Fire Behavior Analyst to access. This is the current National standard fire behavior system. It is often used in conjunction with the “Landfire” biota database.
Technosylva-Wildfire Analyst	A cloud-based subscription service which provides advanced, high-resolution wildfire spread prediction and probability on a landscape scale. The system requires a license and certification as a Wildfire Geographic Information Specialist for access and effective use. This is currently a developing standard utilized by CAL FIRE.

### **Fire Behavior Modeling Samples**

While a number of wildfire prediction tools are available to determine wildfire intensity and trajectory, a commonly used basic assessment tool is “BehavePlus”. The system was developed and is maintained by the U.S. Government and may be accessed at: <https://www.frames.gov/behaveplus/home>

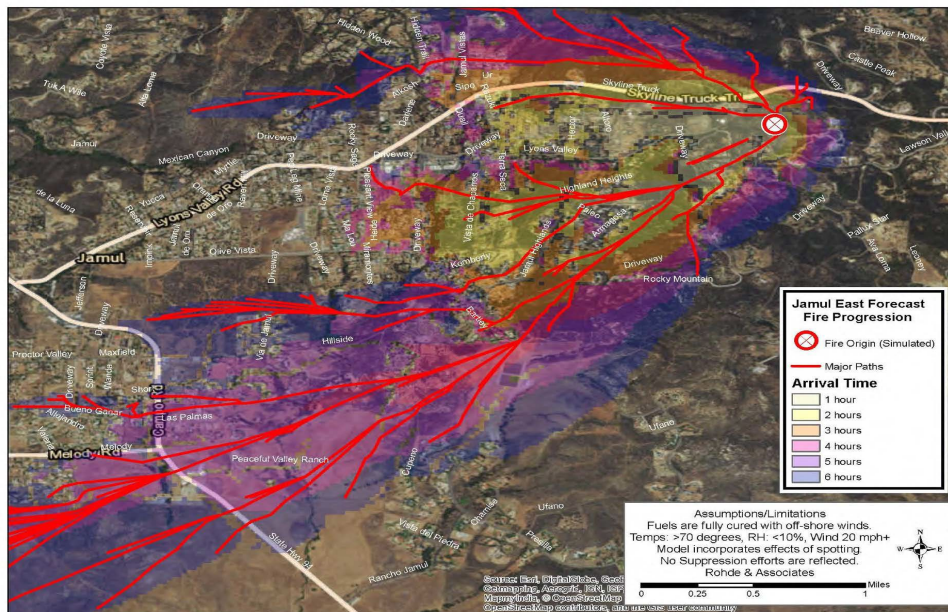
BehavePlus is an application which may be utilized by lay practitioners without a license. It creates a fire behavior forecast for a single line of fire trajectory and factors fuel type, slope, winds, and other related basic wildfire behavior that is directly input by the user. Since it develops fire behavior outputs for a single line of fire trajectory, multiple runs are often needed to fully characterize a development site. BehavePlus produces results which have a general accuracy of +/- 15%. Because of this variability, modeling results for BehavePlus should be reviewed by a qualified wildfire professional for accuracy.

Charts have been developed in this section that offer BehavePlus outputs for areas of San Diego County as a reference (see below) and may in some Cases offer alternatives to using the modeling application, but may be inadequate for complex fuel and terrain conditions.

Other fire models are available that develop high resolution, landscape scale fire models which generally have a technical accuracy of +/- 1-3%. They also produce stronger forecast of spotting potential and extreme fire behavior. Most of these models require a license for use, and expertise in inputting and interpreting resulting data. (See fire models, below).



## Example of advanced fire modeling product- Farsite/FlamMap Models, Jamul CA.



### Using BehavePlus

The BehavePlus fire behavior modeling system is the least complex to use and does not require a license to access applications. As such, it is the most likely system many users will select. It may be downloaded for use on most computers, tablets, or cell phones. It should be understood that the system offers basic rather than advanced fire behavior outputs. Users of the BehavePlus prediction system must be careful to input accurate data into the system so that accurate fire behavior forecasting is created. Current weather data may also be retrieved at <http://famweb.nwgc.gov/weatherfirecd/> for input into the application.

### BehavePlus Charts

As an alternative to using the BehavePlus application, charts (see below) have been prepared which indicate average BehavePlus outputs for San Diego County. These charts reflect 20 years of average weather (Months of April-December, 2000-2020) and associated rates of spread and fireline intensity data. The data has been validated by National Fire Danger Rating System and Remote Automated Weather Station data, and U.S.D.A. Forest Service records.

Users of BehavePlus should plot and report two trajectory runs for each calculated site. One for daytime summer condition using the most prevalent (onshore) wind vector, and a second projection using Santa Ana wind conditions, those offshore winds typically occurring in the fall of the year producing Southern California's worst case fire behavior. Since BehavePlus is limited to a single line of fire trajectory as its output, users are cautioned to complete several trajectories for every square mile under consideration using the most favorable sites of wind, topography, and fuels for wildfire development, and to average those outcomes for summer and Santa Ana period average conditions to more accurately determine wildfire behavior over a larger spatial area.



The Burning Index (BI) output calculated by BehavePlus is included for reference in the attached charts. The “BI” represents the relative difficulty of controlling a wildfire and is calculated from the collective impacts of temperature, wind, relative humidity, and fuel (vegetation) moisture. The Burning Index may be roughly translated to expected flame lengths (FL) by dividing the BI by 10. (Example:  $BI = 125/10 = FL$  or 12.5 feet in flat terrain).

Outputs from BehavePlus should be plotted on a topographic map displaying the line of trajectory and other data used in the calculation, along with the outputs of Rate of Spread and Fire Line Intensity (Flamelengths) produced.

### Example of Behave Use

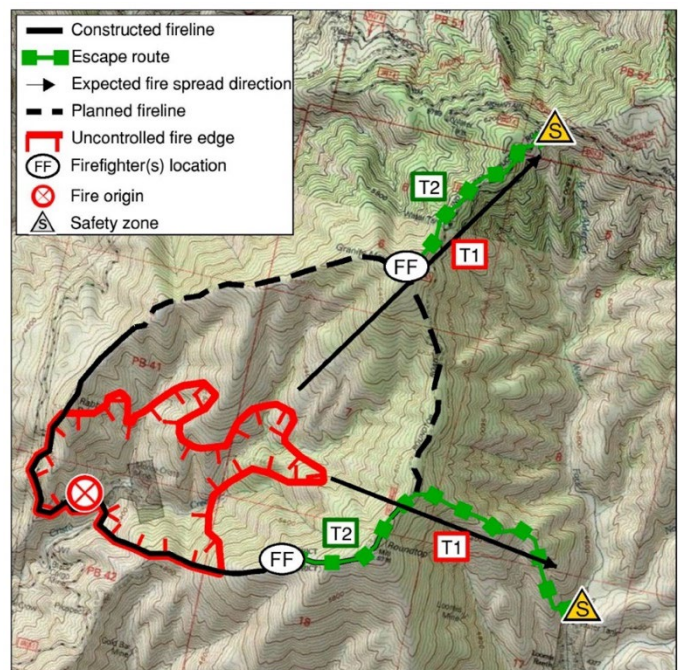
Use BehavePlus to calculate fire spread in directions likely fire trajectory, as shown by arrows on map to right. (plot these on a map)

Example inputs:

- Summer winds (interior),
- Fuel Model 4 (heavy brush),
- 50% slope

Example Outputs:

- Rate of Spread: 620 ft./min.
- Flame Lengths: 56 feet



**Table 1: BEHAVE Plus 5.0.1**

Average-Worst case sustained winds (10 min. average and peak) Fuel Model 1 (knee high grass) at 50% slope

Zone	Period	Temperature	Relative Humidity	Sustained Wind Speed	Burning Index (99%)	Rate of Spread Feet/min	Flame length
<b>Maritime</b>	Summer	70-89°F	30-34%	17 mph	41	300	8
	Santa Ana	90-109°F	5-9%	18 mph	64	470	10
	Peak	90-109°F	5-9%	22 mph	-	550	11
<b>Coastal</b>	Summer	90-109°F	10-14%	19 mph	57	430	9
	Santa Ana	90-109°F	0-4%	21 mph	112	600	12
	Peak	90-109°F	0-4%	26 mph	-	730	13
<b>Transitional</b>	Summer	90-109°F	10-14%	19 mph	119	430	9
	Santa Ana	90-109°F	5-9%	28 mph	145	730	13
	Peak	90-109°F	5-9%	41 mph	-	730	13
<b>Interior</b> (Use for Coastal Sage/Grass mix, any region)	Summer	90-109°F	5-9%	18 mph	153	540	15
	Santa Ana	90-109°F	5-9%	24 mph	183	839	18
	Peak	90-109°F	5-9%	56 mph	-	839	18
<b>Desert</b>	Summer	90-109°F	5-9%	18 mph	153	470	10
	Santa Ana	90-109°F	5-9%	24 mph	168	730	13
	Peak	90-109°F	5-9%	56 mph	-	730	13

**Table 2: BEHAVE Plus 5.0.1**

Average-worst case sustained winds (10 min. average and peak, Fuel Model 4 (heavy chaparral shrub) at 50% slope

<b>Zone</b>	<b>Period</b>	<b>Temperature</b>	<b>Relative Humidity</b>	<b>Sustained Wind Speed</b>	<b>Burning Index (99%)</b>	<b>Rate of Spread Feet/min</b>	<b>Flame length</b>
<b>Maritime</b>	Summer	70-89°F	30-34%	17 mph	41	480	47
	Santa Ana	90-109°F	5-9%	18 mph	64	620	56
	Peak	90-109°F	5-9%	22 mph	-	700	60
<b>Coastal</b>	Summer	90-109°F	10-14%	19 mph	57	989	50
	Santa Ana	90-109°F	0-4%	21 mph	112	740	61
	Peak	90-109°F	0-4%	26 mph	-	870	65
<b>Transitional</b>	Summer	90-109°F	10-14%	19 mph	119	615	54
	Santa Ana	90-109°F	5-9%	28 mph	145	1100	73
	Peak	90-109°F	5-9%	41 mph	-	1600	87
<b>Interior</b>	Summer	90-109°F	5-9%	18 mph	153	620	56
	Santa Ana	90-109°F	5-9%	24 mph	168	870	66
	Peak	90-109°F	5-9%	56 mph	-	2400	105
<b>Desert Chaparral</b>	Summer	90-109°F	5-9%	18 mph	153	620	56
	Santa Ana	90-109°F	5-9%	24 mph	168	870	66
	Peak	90-109°F	5-9%	56 mph	-	2400	105

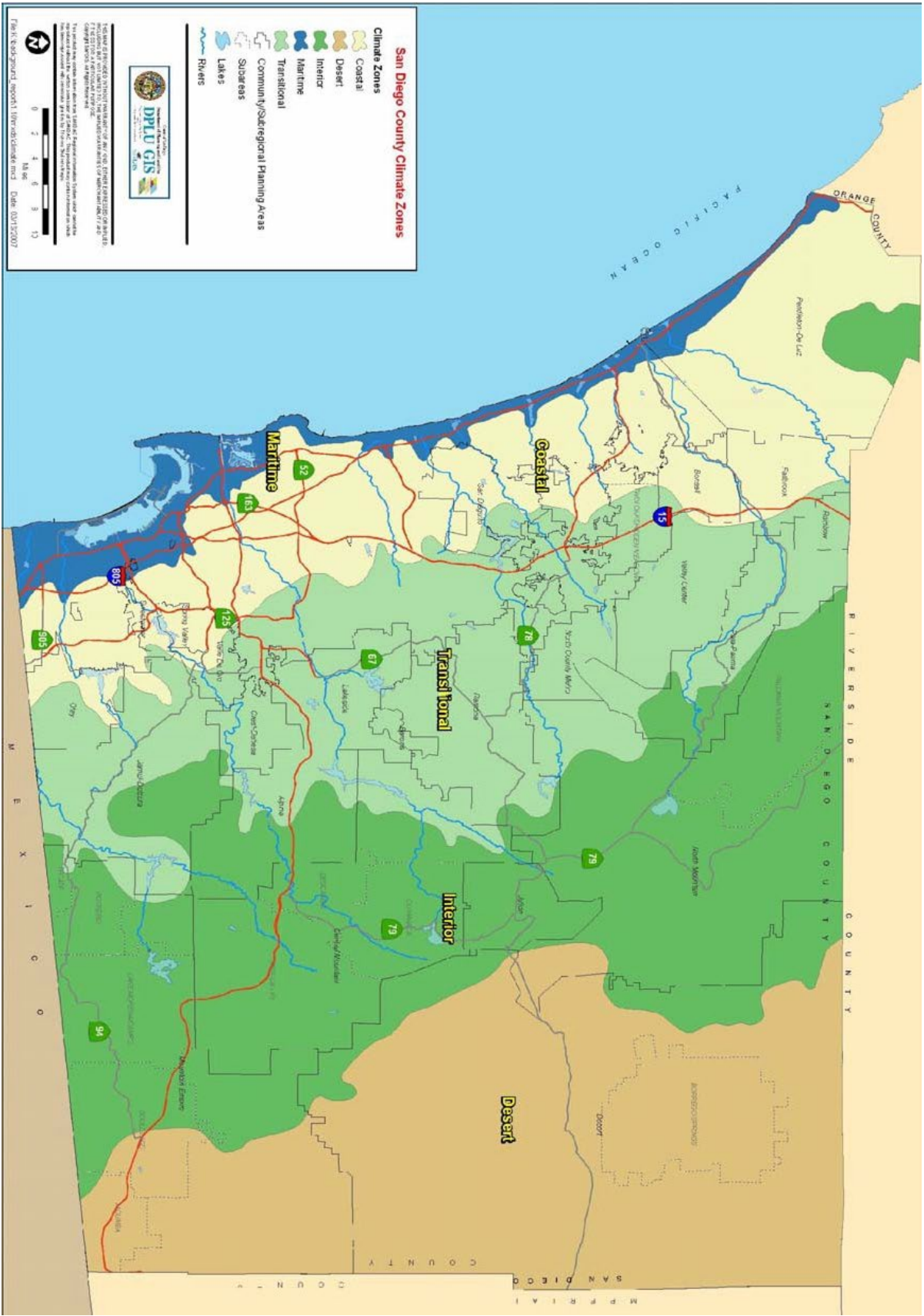
**Table 3: BEHAVE Plus 5.0.1**

Average-worst case sustained winds (10 min. average and peak, Fuel Model 10 (mature timber with understory ) at 50% slope

\* Surface Fire Only. Behave does not model crown fires in timber \*\* Fuel type occurs only in the interior zone of San Diego County

<b>Zone</b>	<b>Period</b>	<b>Temperature</b>	<b>Relative Humidity</b>	<b>Sustained Wind Speed</b>	<b>Burning Index (99%)</b>	<b>Rate of Spread Feet/min*</b>	<b>Flame length*</b>
<b>Interior</b>	Summer	90-109°F	5-9%	18 mph	153	30	10
	Santa Ana	90-109°F	5-9%	24 mph	168	40	11
	Peak	90-109°F	5-9%	56 mph	-	100	17

FIGURE 12: Climate Zones in San Diego County



## LIST OF PREPARERS & PERSONS/ORGANIZATIONS CONTACTED

Provide a list of preparers, noting each person included on the County list of approved consultants. Note that the principal author must be on the County list or the report will not be accepted.

## REFERENCES

Include a list of all technical references used in the report

## TECHNICAL APPENDICES

The Table of Contents for the Appendices must list each document attached to the report in the order in which it is included. The following documents must be included in the report, either in the text (if size is appropriate) or as an appendix:

- Site Map/Plot Plan with topography overlay
- Aerial photo of site and immediate vicinity – with property lines shown
- Photos of the site at ground level
- Fire Modeling
- Completed and signed form “PDS #399F – Project Facility Availability Form for Fire” (if required for the specific permit application)

## FPP LETTER REPORT OUTLINE

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The FPP – Letter Report is for project applicants who are processing minor projects that have little to no anticipated risk of loss, injury or death involving wildland fires. Discretionary permits that may qualify for a FPP – Letter Report include projects that are located within the State Responsibility Areas and are “infill” projects with virtually no wildlands in the immediate vicinity. The FPP – Letter Report may be prepared by the applicant or the applicant’s representative, instead of a fire consultant. However, the applicant may employ the services of a fire consultant to prepare a Letter Report FPP. The FPP Letter Report preparer does not have to be on the County’s approved list of consultants.

***If upon review of the completed FPP - Letter Report, the County determines that code issues are unresolved or inadequately addressed or the project cannot comply with required conditions that are specified in the “Project Exposure to Wildland Fires” section below, the project does not qualify for a FPP – Letter Report, and a FPP – Full Report will be required. The FPP must be prepared by a consultant currently approved by the County for such reports, and must follow the prescribed format.***

The FPP – Letter Report must be written in the following format. Guidance on how to complete certain sections of the report is shown in *(italics)*. Questions on how to complete the form can be directed to (858) 694-2960.

*(Date)*

County of San Diego  
Planning & Development Services (PDS)  
5510 Overland Avenue, Suite 310  
San Diego, CA 92123

*(Local Fire Agency/District Having Jurisdiction)*

*(Address)*

*(City, State, Zip)*

SUBJECT: FIRE PROTECTION PLAN – LETTER REPORT

*(Project Common Name)*

*(Project Application Number – e.g. TPM #####)*

*(Assessor Parcel Numbers e.g. ###-###-##-00)*

This FPP – Letter Report is submitted pursuant to the County Consolidated Fire Code, to address the adverse environmental effects that a proposed project may have from wildland fire and to provide mitigation of those impacts to ensure that the project does not expose people or structures to a significant risk of loss, injury or death involving wildland fires.

## **PROJECT DESCRIPTION**

*(Briefly describe the project being proposed – acreage, parcel size range (e.g. “24.5 acre parcel in A-72 zone divided into four 4.0 to 6.5 acre residential lots”)*

## **ENVIRONMENTAL SETTING**

- 1. Location:** *(give the community where the project is located [e.g. Fallbrook] and describe the character of the area that surrounds the subject property , i.e. how it is currently developed)*
- 2. Topography:** *(generally identify the terrain of the site and adjacent properties (e.g. land is generally flat immediately off Access Street for 100 yards followed by rolling hills. Unusually high steep terrain can be found in the northwestern corner of the site and beyond )*
- 3. Geology:** *(describe any geological features that might affect access roads or building pad design, or increase or reduce wildfire potential on the site.)*
- 4. Flammable Vegetation:** *(discuss the type and density of vegetation – this information is typically available in the project Biology Report. If a Biology Report is not required for your project, generally describe the types of plants that are found on the property and the density of vegetation.)*
- 5. Climate:** *(identify general climate and seasonal events – e.g. “coastal or west sloping valley or mountainous or desert climate – subject to Santa Ana wind events, flash flooding”, etc.)*

## **PROJECT EXPOSURE TO WILDFIRES**

- 1. Water Supply:** *(Describe how water is going to be supplied to the project. NOTE: If the project is outside the boundaries of a water district, include the following language in this*

*section of the FPP – Letter Report: “All proposed structures shall have a water tank, with size, location and fire department connection (FDC) consistent with the County and Consolidated Fire Code.”*

*If the project is inside the boundaries of a water district, a copy of the Service Availability Form for water must be attached to this FPP – Letter Report. Furthermore, include the following language in this section of the FPP – Letter Report: “Hydrants shall be located along fire access roadways as determined by the Fire Marshal to meet operational needs, at intersections, at cul-de-sacs, and at intervals pursuant to the County Consolidated Fire Code. Required fireflow in water main is 2500 gallons per minute.*



## 2. Fire Access Roads:

Location: (Describe the location of all access roads and the number of parcels that will access each road, include development pads and driveways). Explain how the primary access road complies with the distance thresholds specified under the County Consolidated Fire Code.

Width: (Describe the width of all access roads. NOTE: All fire access roads including driveways must be improved to a minimum 16' width all-weather surface suitable for travel by 50,000 lb. fire apparatus. Fire access roads serving more than two single-family dwellings shall be a minimum 24' wide with all-weather surface suitable for travel by 50,000 lb. fire apparatus.

Vertical Clearance: (Include a statement that "minimum vertical clearance of 13 feet 6 inches must be maintained for the entire required width of fire access roads".)

Grade: (Describe the maximum grade in percent for the roads and driveways. NOTE: Grades greater than 15% are not permitted without mitigation; grades greater than 20% are prohibited.)

Surface: (Describe the surface improvements for all roads and driveways. Be specific rather than quoting this entire code section).

3. **Setback from Property Lines:** (The minimum setback from any property line in high hazard areas is 30 feet (even though Zoning Setback may be less). Exceptions may be allowed if parcels are smaller than one acre, upon review and approval from the FAHJ and County. Minimum setback from property lines abutting national forests, open space preserves, and designated riparian areas is 100 feet. The applicable statement must appear in this section, and any such forest, preserve or riparian areas must be identified.)
4. **Building Construction:** (The Report must include the following statement: "All structures shall comply with the ignition-resistive construction requirements: Wildland-Urban Interface areas of Chapter 7A of the County Building Code.")
5. **Fire Protection Systems:** (The Report must include the following statement: "All habitable structures and attached garages shall have residential fire sprinklers per County Code or County Consolidated Code requirements.")
6. **Defensible Space:** (The Report must include the following statement: "A minimum 100-foot Fuel Management Zone will be established and maintained around all structures over 250 square feet in size. No off-site clearing is required or authorized.")
7. **Vegetation Management:** (The Report must include the following statement: "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 clearly and permanently marked. Plants used in the Defensible Space will be from an approved fire resistant planting materials list that is maintained by County of San Diego, Department of Planning & Development Services.”)*

8. **Fire Behavior Computer Modeling:** Based on preliminary evaluation by the County Fire Marshal, Computer Fire Behavior Modeling is not required for this **FPP – Letter Report** (Note: Contact the Fire Authority Having Jurisdiction [FAHJ] to confirm).

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Prepared By (Signature) <sup>1</sup>	Date	Printed Name	Title
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Property Owner (Signature) <sup>1</sup>	Date	Printed Name
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<sup>1</sup> The FPP – Letter Report will not be accepted without original signatures.

ATTACHMENT A

Building Materials and Components – Baseline, Enhanced, & Optimum Scenarios

Table 5.2. Building materials and components in the Baseline, Enhanced, and Optimum scenarios.

	BASELINE			ENHANCED			OPTIMUM		
	Northern California	Southern California	Northern California	Northern California	Southern California	Northern California	Northern California	Southern California	
<b>Roof</b>									
Fascia	Wood	Wood	Wood	Wood	Wood	Fiber-cement	None	None	
Gutter	Vinyl	Vinyl	Vinyl	Vinyl	Vinyl	Metal with metal gutter guards	Metal with metal gutter guards	Metal with metal gutter guards	
Roof surface	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Asphalt composition shingle	Steel roof panels, metal drip edge	Clay tiles, noncombustible end caps, metal drip edge	Clay tiles, noncombustible end caps, metal drip edge	
Underlayment	None	None	None	None	None	Synthetic, fire-resistant	Mineral-surfaced roll roofing	Mineral-surfaced roll roofing	
<b>Under-Eave Area</b>									
Soffit	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Open eaves (no soffit)	Fiber-cement	Stucco	Stucco	
Under-eave vent	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Circular metal vents between rafters	Metal strip vents	Metal strip vents	Metal strip vents	
<b>Exterior Walls</b>									
Door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Solid-core birch wood; vinyl-clad wood-framed sliding glass door; fiberglass garage door	Calvanized steel with insulated glass panel; aluminum-framed tempered-insulated-glass sliding door; metal garage door	Calvanized steel with insulated glass panel; aluminum-framed tempered-insulated-glass sliding door; metal garage door	Calvanized steel with insulated glass panel; aluminum-framed tempered-insulated-glass sliding door; metal garage door	
Dryer vent	Plastic, louvered	Plastic, louvered	Plastic, louvered	Plastic, louvered	Plastic, louvered	Metal	Metal	Metal	
Siding	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Wood composite cladding, gypsum wallboard (ending six inches above grade)	Fiber-cement lap siding	Stucco	Stucco	
Trim	Wood composite	Wood composite	Wood composite	Wood composite	Wood composite	Fiber-cement	Stucco	Stucco	
<b>Attached Deck</b>									
Deck surface	Redwood (non-fire-retardant-treated)	Plastic composite, uncapped	Redwood (non-fire-retardant-treated)	Plastic composite, uncapped	Plastic composite, uncapped	Plastic composite, capped; metal grate at deck-to-wall junction	Plastic composite, capped; metal grate at deck-to-wall junction	Metal decking, metal grate at deck-to-wall junction	
Fascia	Redwood	Plastic composite	Redwood	Plastic composite	Plastic composite, capped	Metal	Metal	Metal	
Railing	Redwood	Plastic composite	Redwood	Plastic composite	Plastic composite	Metal	Metal	Metal	
Structural support system	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Preservative-treated wood	Foil-faced bitumen supporting joists	Metal	Metal	
Underdeck area	Not enclosed	Not enclosed	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	Enclosed with 1/8 inch metal mesh	
<b>Near-Home Landscaping</b>									
Fencing and gate	Cedar	Cedar	Metal chain-link	Metal chain-link	Metal chain-link	Metal chain-link	Metal chain-link	Metal chain-link	
Mulch	Bark mulch	Bark mulch	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	Pea gravel and landscaping fabric	



