PRELIMINARY FIRE PROTECTION PLAN
KELLER CROSSING – TRACT 38163
APN's: 472-110-034, 472-110-002, 472-110-003, 472-110-004, 472-110-007, 472-110-008, 472-110-009, 472-110-033 & 472-110-034
Unincorporated Riverside County, California

February 6, 2026



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PRELIMINARY FIRE PROTECTION PLAN
KELLER CROSSING – TRACT 38163

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1.0 GENERAL DESCRIPTION

The proposed Keller Crossing Project (hereinafter referred to as the Project) is located northwest of the intersection of Highway 79 and Keller Road in an unincorporated area of Riverside County (see Photo #1) within a Very High Fire Hazard Severity Zone. To the north of the Project is protected habitat. The fire protection agency is the Riverside County Fire Department (RCFD) and it is the authority for the Project. This plan was previously approved on August 23, 2023 but due to changes to the number of lots, addition of duplex units, and the reconfiguration and location of the roadways, it is being resubmitted as a new plan. The plan is also being brought up to 2022 California Fire and Building Codes requirements.



Photo #1: Aerial Photo of the Project. *Note the scattered development except for the northern side of the Project which is protected MSHCP land.*

Tract 38163, in which the Project is located, consists of the development of approximately 384 single-family residential lots ranging in size from 3,600 to 11,004 square feet and 310 duplexes whose lots range from 1,925 to 2,245 square feet. To the north of the developed portion of the site

plan is approximately 61.4 acres of open space designated as a Multiple Species Habitat Conservation Plan (MSHCP) area. No fuel modification can occur within this area. The homes to be built will be primarily two-story structures.

Appendices attached to this Preliminary Fire Protection Plan (PFPP), that provide additional information, shall be considered part of this plan.

1.1 General Information

Owner:	D.R. Horton 2280 Wardlow Circle, Ste. 100 Corona, CA 92878
Approving Departments:	
Fire Authority:	Riverside County Fire Department
Water:	Eastern Municipal Water District

1.2 Relevant Building Codes and Standards

Requirements of this FPP are based upon the requirements listed in the 2025 Code of Regulations, title 24, Part 7 – California Wildland-Urban Interface Code (WUIC), 2025 California Fire Code (CFC), Chapter 49, and Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires. It is also based on other codes and standards with Local Amendments as required; California Building Code (CBC); 2025 California Residential Code Section R337; National Fire Protection Association Standards (NFPA) 13D, the California State and Local Responsibility Area Fire Hazard Severity Zone Map; Riverside County Ordinance No. 787.11, amending Ordinance No. 787, Riverside County Health and Safety Code - Declaration of Nuisance 6.15.020, and supporting guidelines, the California State and Local Responsibility Area Fire Hazard Severity Zone Map; and NFPA Standard 1140 – Standard for Wildland Fire Protection.

1.3 Hazardous Vegetation Around Buildings - Laws and Regulations

The following laws and regulations regarding hazardous vegetation guide the requirements for Fire Protection. These include the following: Public Resources Code, Section 4291 through 4294. California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 3, Section 1299 (see guidance for implementation "General Guideline to Create Defensible Space"). California Wildland-Urban Interface Code, California Government Code, Section 51182. California Code of Regulations, Title 19, Division 1, Chapter 7, Subchapter 1, Section 3.07, Riverside County Ordinance No. 787.11 amending Ordinance No. 787 and the California Wildland Urban-Interface Code as amended.

1.4 Fire Protection Plans - California

Per Section 602.3 of the WUIC, a Final Fire Protection Plan (FFPP) shall be reviewed and approved prior to the start of construction. A FFPP shall include landscape and planting plans for all the common areas that are consistent with this plan. The landscape architect, when developing their plan, shall incorporate the plant material, planting design, and maintenance

requirements identified in the FFPP. When the landscape plan is completed, it will be incorporated into the FFPP as Appendix 'H' or provided as a separate file.

The WUIC states that the contents of a Fire Protection Plan shall be based on a project-specific wildfire hazard assessment that includes considerations of location, topography, aspect, and climatic and fire history. The plan shall identify conformance with all applicable state wildfire protection regulations, statutes and applicable local ordinances, whichever is more restrictive. It shall address fire department access, egress, road and address signage and water supply in addition to fuel reduction in accordance with PRC 4290; the defensible space requirements in accordance with PRC 4291 or Government Code 51182; and the applicable building codes and standards for wildfire safety. The plan shall identify mitigation measures to address the Project's specific wildfire risk.

Pursuant to Section 602.3.1 of the WUIC, a Preliminary Fire Protection Plan (PFPP) shall include:

- Total size of the project.

- Information on the adjoining properties on all sides, including current land uses, and if known, existing structures and densities, planned construction, natural vegetation, environmental restoration plans, roads and parks.

- A map with all project boundary lines, property lines, slope contour lines, proposed structure foundation footprints, and proposed roads and driveways. The map shall identify project fuel modification zones and method of identifying the fuel modification zone boundaries.

As the landscape plan is under development, this plan is a PFPP.

A FFPP per Section 602.3.2 of the WUIC shall include the items listed above in Section 602.3.1 and the following:

1. A map identifying all proposed plants in the fuel modification zones and a legend that includes a symbol for each proposed plant species. The Plan shall include specific information on each species proposed, including but not limited to:

    a. The plant life-form;
    b. The scientific and common name; and
    c. The expected height and width for mature growth.

2. Identification of irrigated and non-irrigated zones.
3. Requirements for vegetation reduction around emergency access and evacuation routes.
4. Identification of points of access for equipment and personnel to maintain vegetation in common areas.
5. Legally binding statements regarding community responsibility for maintenance of fuel modification zones.

6. Legally binding statements to be included in covenants, conditions and restrictions regarding property owner responsibilities for vegetation maintenance.

This PFPP assesses the overall on-site and off-site wildland fire hazards and risks that may threaten life and property associated with the proposed Project. It includes requirements for fire safe construction and establishes both short-term and long-term fuel treatment actions required to minimize any wildland fire hazards.

Appendices attached to this FPP that provide additional information shall be considered part of this plan.

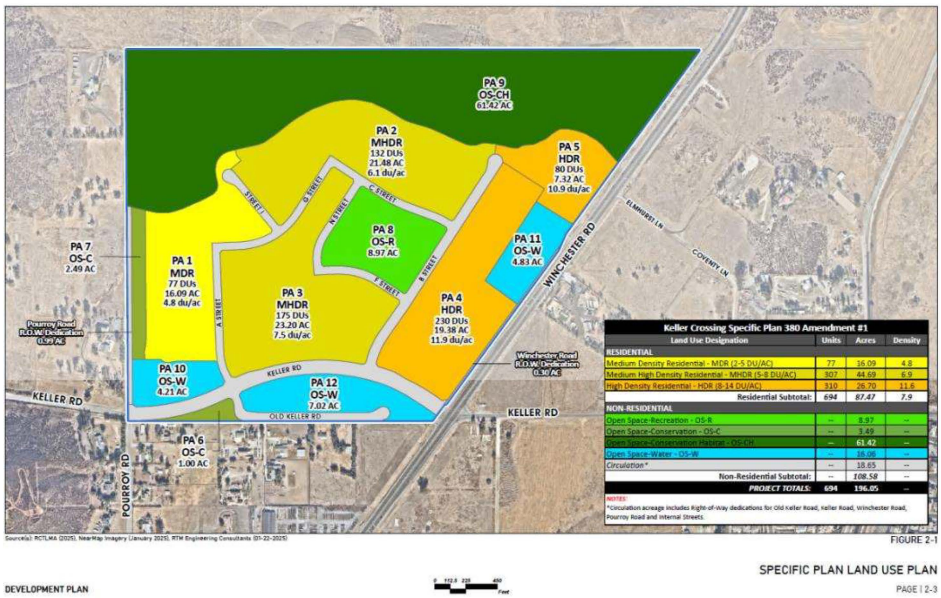


Figure 1 – Specific Plan. *Note the large green area along the north side of the Tract which is protected Open Space in which no Fuel Modification Zone can exist.*

2.0 WILDLAND FIRE HAZARD AND RISK ASSESSMENT

The following hazard and risk assessment is based upon historical weather data and existing and forecasted vegetation that would exist in a climax plant community. Wildfire risk is a measure of the chance of a fire starting, as determined by the presence and activity of causative agents. Fire hazard is the result of a combination of vegetation, topography, weather, and the threat of fire to life and property that create difficult and dangerous conditions. The primary focus of this document is mitigation of the fire hazard and to a lesser extent, the reduction of risk of a fire starting within the tract.

2.1 Weather Review and Assessment

Weather has a dramatic influence on wildland fire behavior. The most critical weather pattern to the Project area is a hot, dry offshore wind, typically called a Santa Ana. Such wind conditions are usually associated with strong (>50 MPH), hot, dry winds with very low (<15%) relative humidity (See Figure 2). Santa Ana winds originate over the dry desert land and can

occur anytime of the year; however, they generally occur in the late fall (September through November). This is also when non-irrigated vegetation is at its lowest moisture content. Riverside County is one of the areas in southern California that is strongly influenced by powerful Santa Ana winds.

Fire Agencies throughout the western United States rely on a sophisticated system of Remote Automated Weather Stations (RAWS) to monitor weather conditions and aid in the forecasting of fire danger. The closest RAWS to the Project is the Clark RAWS located at Latitude 33° 52' 36" N and Longitude 117° 18' 32" W at an elevation of 1,720 feet. This is approximately 240 feet higher than the Project location. Data for all RAWS is archived in the Western Region Climate Center in Reno, Nevada. Figure 1 is an example of weather data from the Clark RAWS.

The typical prevailing summer time wind pattern is out of the west/southwest and normally is of a much lower velocity (5-10 MPH with occassional gusts to 20 MPH) and is associated with relative humidity readings ranging between 20% and occasionally more than 50% due to the sites proximity to onshore winds from the ocean.

In addition to Santa Ana winds, there is a historic pattern of wildland fires burning from the southwest to northeast. Every 5-10 years, a "rare event" hot dry, southwest to west wind of 30 MPH will occur. This moderately strong, dry wind condition usually occurs in the late afternoon or early evening on very hot days, especially during the normal summertime (June through September) months.

All other (northwest, southeast and south) wind directions may be occasionally strong and gusty; however, they are generally associated with cooler moist air and have higher relative humidity (>40%). They are considered a serious wildland fire weather condition when wind speeds reach >20-MPH.

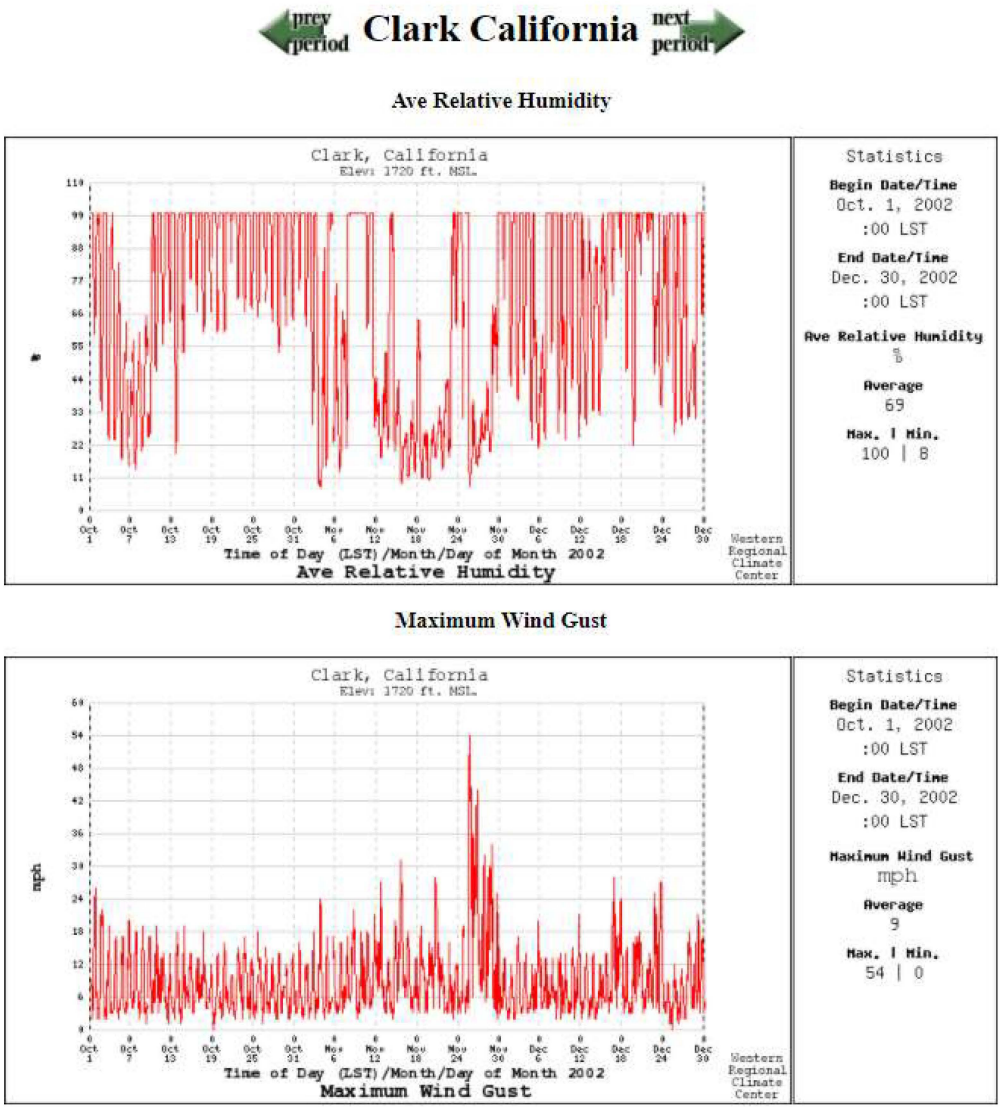


Figure 2 – Relative Humidity and Maximum Wind Gust for the Clark RAWS. *Note the 54 MPH Wind Gust on November 26 with Relative Humidity in the Teens.*

2.2 Off-Site Fire Hazard and Risk Assessment

Much of the Project is located on lightly vegetated nearly level terrain. Steeper terrain containing protected open space is located to the north. Additional small areas of open space that are not protected are located along portions of the western and eastern boundary. The last major wildland fire to burn over the area was in 1993 explaining to some degree the lack of a more mature vegetative cover on the hillsides. The past few decades have also had multi-year droughts that further reduce the speed of plant recovery following a wildfire.

Northern and Eastern Boundary Fuels

The northern boundary abuts protected open space and habitat along the entire length of the northern boundary. The open space is lightly vegetated without any trees (See Photo #2). The eastern boundary abuts Highway 79, a major 4 lane highway (Photo #3) that is nearly 80 feet in width, shoulder to shoulder. Slopes are nearly level where the homes are to be built and then

ranging from 15 - 35 percent in the protected open space. Plant species that grow on the site include both native and exotic grass and weeds, buckwheat, sage, mustard and a few cactuses.



Photo #2 - Looking North Toward the Northern Boundary. *Protected Open Space is Located on the Steeper Terrain. Homes are Planned in the Foreground.*

Along the northern and eastern Boundaries of the Project is sensitive habitat. The Western Riverside County Multiple Species Habitat Conservation Plan (WR-MSHCP) is a comprehensive, multi-jurisdictional Habitat Conservation Plan focusing on conservation of species and their associated habitats in Western Riverside County. The overall goal of this plan is to maintain biological and ecological diversity within a rapidly urbanizing region. To this end, the managers of the MSHCP have required there to be a 8 foot in height wall between the homes and the protected habitat. Firewise2000, LLC will assess this feature in more detail in the Infrastructure Section of this plan.

In most wind conditions a fire beginning in the open space area north of the Project will burn downhill on manfuactured slopes towards the homes and or be pushed parallel to the northern subdivision boundary such as for lots 41, 64, and 65 as the Project boundary faces northwest, therefore these homes are a lesser concern than areas where slopes are uphill into the development.

The typical fuel model for the climax vegetation is a combined fuel model of SCAL 18 – Sage/Buckwheat with 1- hour fuels of 5.5 tons/acre and 10- hour fuels of .8 tons/acre and GR2 – Low Load Dry Climate Grass with 1- hour fuels of 0.1 tons/acre and no 10-hour fuels.



Photo #3 – Looking South along the Eastern Boundary and Highway 79. *The Development is located to the right of the fence.*

Southern and Western Boundary Fuels

As seen in Photo #4, the fuels along the western edge of the Project area light as the area has been periodically used for agricultural purposes. Dryland farming has occurred on the site for at least the past 30 years based on a review of aerial imagery. The vegetation over time, without a disturbance would like reach a climax vegetation type that for fire behavior planning consists of a combined fuel model of gr2 – Low load, dry climate grass (80%) and SCAL18 – Sage/Buckwheat (20%)]. Slopes in these areas range from nearly level to 10 percent.

A dirt roadway is located along western exposure. All the fuels between this roadway and the homes will be maintained to either Zone 1A, 1B, or 2A criteria which will create over 100 feet of fuel treatment. These action will mitigate the wildland fire concerns to insignificant levels.

As seen in Photo #5, the existing Old Keller Road has scattered development along the roadway. The vegetation and slopes are the same as those described above.

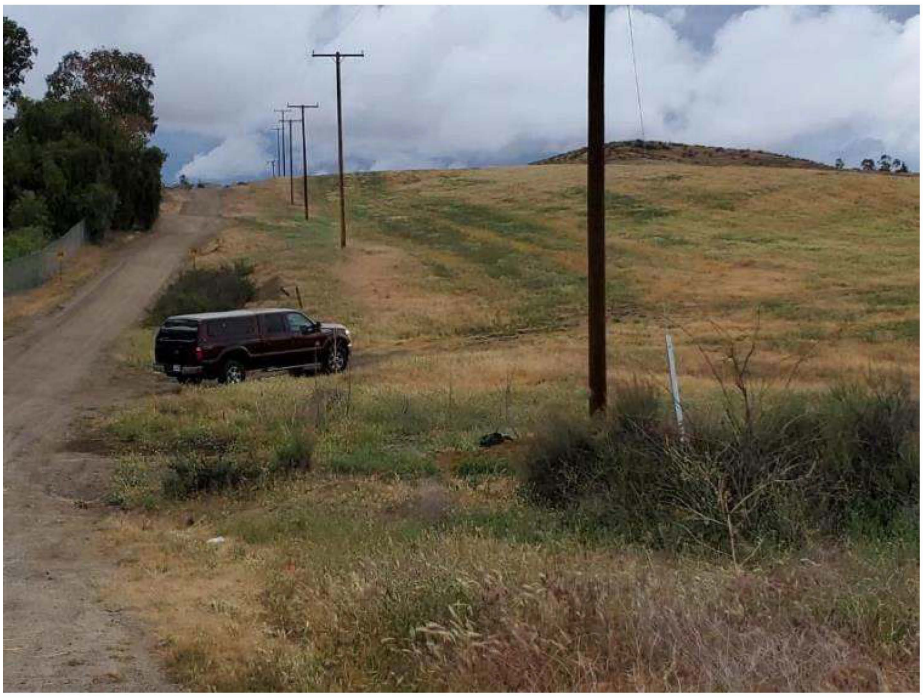


Photo #4 – Looking North Along the Western Boundary. *Pourroy Road is gravel for most of its Length. Homes Are Planned to be Located to the right of the telephone poles.*



Photo #5 - Looking East Along Old Keller Road. *The Project is Located to the Left of the Roadway. This Portion of Keller Road is Scheduled to be Realigned.*

Keller Road is to be realigned. Between the roadway and the Project, two detention basins will be established thereby removing additional wildland fuels.

2.3 On-Site Fire Hazard and Risk Assessment

All the native and exotic vegetation within the Project area will be cleared and graded. Therefore, there is no significant wildland fire issues within the development footprint.

The greatest fire concern for the proposed Project interior are embers from a fire burning outside the tract or a structure fire within the tract that could land on homes or vegetation within the tract, especially during a period of high winds with low relative humidity.

2.4 Critical Wildfire Concerns

The undeveloped areas adjacent to the Project can contribute to a damaging wildland fire event. Any wind or topography driven wildfire burning under a northeastern (*Santa Ana*) wind from the north or east burning toward the development or a wildfire burning under a "rare event" 30 MPH southwestern wind from the west or south of the development can create a significant wildland fire hazard to the proposed structures due to wind-blown embers. Wildland fires starting north or east of the proposed residences on a typical fire day with a southwest wind will burn away from the proposed structures and will generally not be a significant wildland fire concern. A wildland fire starting to the west of the development on a Santa Ana wind event day will burn away from the development.

The installation of WUIC construction features combined with Fuel Modification Zone 0 and 1A will mitigate against the wind-blown ember threat (see Sections 5.1 and 6.0 for a discussion of these features). The goal of this PFPP is to prevent the loss of lives, buildings, and personal property when wildfires occur with the challenge of developing well planned home sites adjacent to wildland vegetation. This goal is accomplished by requiring all homes to be built with ignition resistant materials per the WUIC and properly designed and maintained fuel treatments that safely mitigate the fire hazard to insignificant levels. When the required fuel treatments cannot be met, additional construction features shall be required.

2.5 Fire History

Fire history is also a fire concern as it provides information as to the frequency of wildfire upon a landscape. Only one large wildland fire of over 100 acres is shown in Figure 3. That was California Fire of October 1993. It destroyed 29 structures. It was caused by a powerline during very high winds. Fire history data was obtained from Cal Fire. Smaller fires are not mapped and therefore are not shown. There likely have been many small fires that have burned within or adjacent to the Project.

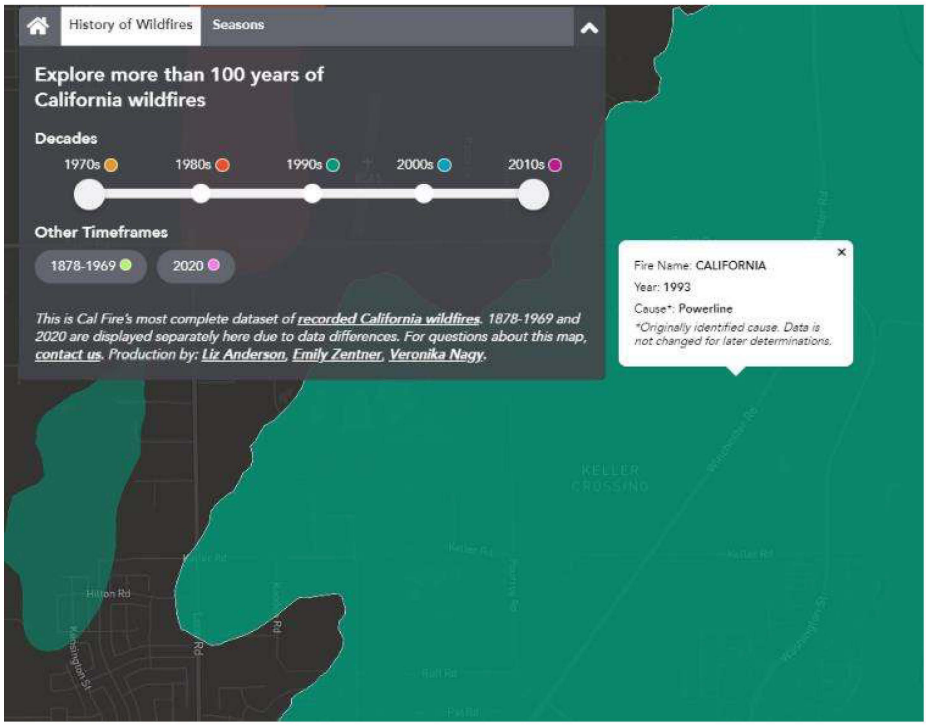


Figure 3 – Fire History. *The 1993 California Fire was the last large wildland fire to burn all the Project site.*

3.0 PREDICTING WILDLAND FIRE BEHAVIOR

The BehavePlus 6.0.0 Fire Behavior Prediction and Fuel Modeling System developed by USDA–Forest Service research scientists Patricia L. Andrews and Faith Ann Heinsch at the Intermountain Forest Fire Laboratory, Missoula, Montana, is one of the best systematic methods for predicting wildland fire behavior. The BehavePlus 6.0.0 fire behavior computer modeling system is utilized by over 90 percent of wildland fire experts nationwide. Wildland fire managers use the BehavePlus 6.0.0 modeling system to project the expected fire intensity, rate-of-spread and flame lengths with a reasonable degree of certainty for use in Fire Protection Planning. ***Fire*wise2000, LLC** used the BehavePlus 6.0.0. Fire Behavior Prediction Model to make the fire behavior assessments for the Project.

Because the model was designed to predict the spread of a surface fire, the fire model describes the fire behavior only within the flaming front. The primary driving force in the fire behavior calculations is the dead fuel, less than one-fourth inch in diameter; these are the fine fuels that carry the fire. Fuels larger than 1/4-inch in diameter contribute to fire intensity, but not necessarily to fire spread. The BehavePlus fire model includes a model (Surface fire spread and intensity) to describe a wildfire spreading through surface fuels, which are the burnable materials within six (6') feet of the ground and contiguous to the ground. Regardless of the limitations expressed, experienced wildland fire managers can use the BehavePlus modeling system to project the expected fire intensity (expressed as Btu/ft/sec), rate-of-spread (feet/minute) and flame lengths (feet) with a reasonable degree of certainty for use in fire protection planning purposes. Of these three fire behavior projections, flame length is the most critical in determining structure protection

requirements. Comparisons of computer calculations to observed fire behavior by ***Fire*wise2000, LLC** wildland fire staff has validated the modeling system for use in wildland protection planning.

3.1 Wildland Fire Behavior Calculations for the Off-site and On-site Hazardous Vegetative Fuels

Wildland fire behavior calculations have been projected for the hazardous vegetative fuels located adjacent to and bordering the proposed development. These projections were based on "worst case" Riverside County fire weather assumptions in the vicinty of the Project area and from site observations and fuel moisture levels typically observed during the local fire season. Weather data was obtained from the RAWS (Remote Automatic Weather Station) network stations closest to the Project area.

All calculations found in this section are based on a "head fire". A head fire is a fire that moves with the wind direction or topography. Because it is pushed by the wind or "wind driven", or uphill with the slope, this type of wildland fire spreads quickly and can have long flame lengths. This makes it one of the most dangerous types of wildfires.

Over the past decade, California and much of the Western United States has been experiencing increased fire behavior from what was typically seen in the past as documented by firefighters from multiple agencies. It is due in part to our warming climate, which frequently results in lower relative humidity over prolonged periods of time in turn resulting in lower moisture content in both living and dead wildland fuels. When fuels are drier, they burn hotter and are easier to ignite, especially on hot dry days as the fuel temperature is closer to its ignition temperature. The fire behavior calculation inputs for anticipated fuel moistures have been adjusted to account for climate change and thus, better represent "worst case" weather. When multiple fire behavior factors occur at the same time, this is sometimes referred to as being in alignment. This happens when humidity is low, both and live and dead fuels moistures are low, winds are high When alignment occurs, fire behavior is dramatically enhanced. These factors can be further enhanced by the vegetation type and topography.

The four (4) scenarios which follow include the projected fire behavior in a surface fire burning in the projected climax vegetation under "worst case" wildland fuel and weather conditions for the Project site followed by the expected fire behavior in treated fuels. All the scenarios display the expected Rate of Fire Spread (expressed in feet/minute), Flame Length (expressed in feet), and Fireline Intensity (expressed in British Thermal Units/foot/second and include the calculation inputs used in the BehavePlus program. The scenarios also show the effect of fuel modification on the Rate of Fire Spread, Flame Length, and Fireline Intensity following the completion of the required fuel treatments.

Fire Scenario #1 Northern Boundary ***Fire Approaching from the North or Northeast*** ***(Late Fire Season With 60 MPH North or Northeast Wind Conditions)***	
Fire Behavior Calculation Input Data • 25 percent slope • 60 mph 20-foot wind speed • 315° slope aspect from north • 45° wind direction from north	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……2% * 10-Hour Fuel Moisture of……2% * 100-Hour Fuel Moisture of……4% * Live Herbaceous Fuel Moisture of……30% * Live Woody Fuel Moisture of…… 45%
Expected Fire Behavior **Combined Fuel Model [gr2 – Low Load, Dry Climate Grass 75% and Fuel Model SCAL18 – Sage/Buckwheat 25%]**	
Rate of Spread - 642 ft/min	
Fireline Intensity - 24,666 BTU/ft/s	
Flame Length - 47.2 feet	
Expected Fire Behavior in Treated Fuels **Combined Fuel Model - [tl6 – Moderate Load Broadleaf Litter 50% and gr1 – Short Sparse Dry Climate Grass 50%]**	
Rate of Spread - 136 ft/min	
Fireline Intensity - 446 BTU/ft/s	
Flame Length - 7.4 feet	

Fire Scenario #2 (Eastern Boundary) ***Fire Approaching from the East*** ***(Late Fire Season With 60 MPH East Wind Condition)***	
Fire Behavior Calculation Input Data • 30 percent slope • 60 mph 20-foot wind speed • 70° slope aspect from north • 225° wind direction from north	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……2% * 10-Hour Fuel Moisture of……2% * 100-Hour Fuel Moisture of……4% * Live Herbaceous Fuel Moisture of……30% * Live Woody Fuel Moisture of……45%
Expected Fire Behavior **Combined Fuel Model [gr2 – Low Load, Dry Climate Grass 80% and Fuel Model SCAL18 – Sage/Buckwheat 20%]**	
Rate of Spread - 663 ft/min	
Fireline Intensity - 25,024 BTU/ft/s	
Flame Length - 47.5 feet	
Expected Fire Behavior in Treated Fuels **Combined Fuel Model - [tl6 – Moderate Load Broadleaf Litter 50% and gr1 – Short Sparse Dry Climate Grass 50%]**	
Rate of Spread - 139 ft/min	
Fireline Intensity - 451 BTU/ft/s	
Flame Length - 7.5 feet	

Fire Scenario #3 (South Boundary) ***Fire Approaching from the South or Southwest*** ***(Late Fire Season With 30 MPH South and Southwest Wind Conditions)***	
Fire Behavior Calculation Input Data • 10 percent slope • 30 mph 20-foot wind speed • 180° slope aspect from north • 225° wind direction from north	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……..2% * 10-Hour Fuel Moisture of……..…2% * 100-Hour Fuel Moisture of.....……..…..4% * Live Herbaceous Fuel Moisture of…...30% * Live Woody Fuel Moisture of…….....55%
Expected Fire Behavior **Combined Fuel Model [gr2 – Low Load, Dry Climate Grass 80% and Fuel Model SCAL18 – Sage/Buckwheat 20%]**	
Rate of Spread - 247 ft/min	
Fireline Intensity - 12,282 BTU/ft/s	
Flame Length - 34.2 feet	
Expected Fire Behavior in Treated Fuels **Combined Fuel Model - [tl6 – Moderate Load Broadleaf Litter 50% and gr1 – Short Sparse Dry Climate Grass 50%]**	
Rate of Spread - 50 ft/min	
Fireline Intensity - 154 BTU/ft/s	
Flame Length - 4.6 feet	

Fire Scenario #4 (West Boundary) ***Fire Approaching from the West or Northwest*** ***(Late Summer Season With 30 MPH Southwest or West Wind Conditions)***	
Fire Behavior Calculation Input Data • 10 percent slope • 30 mph 20-foot wind speed • 280° slope aspect from north • 270° wind direction from north	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……..2% * 10-Hour Fuel Moisture of……..…2% * 100-Hour Fuel Moisture of.....……..…..4% * Live Herbaceous Fuel Moisture of…...30% * Live Woody Fuel Moisture of…….....55%
Expected Fire Behavior **Combined Fuel Model [gr2 – Low Load, Dry Climate Grass 80% and Fuel Model SCAL18 – Sage/Buckwheat 20%]**	
Rate of Spread - 247 ft/min	
Fireline Intensity - 12,292 BTU/ft/s	
Flame Length - 34.2 feet	
Expected Fire Behavior in Treated Fuels **Combined Fuel Model - [tl6 – Moderate Load Broadleaf Litter 50% and gr1 – Short Sparse Dry Climate Grass 50%]**	
Rate of Spread - 51 ft/min	
Fireline Intensity - 155 BTU/ft/s	
Flame Length - 4.6 feet	

3.2 Interpreting Fire Behavior

When assessing the fire hazard flame length is a critical componet. Flame length modeled for worst case high winds, fuels, fuel moisure, and topography is an indicator of how close to a structure the flame will get from wildland fuels. It is critical not to allow direct contact with a structure. How flame lengths are measured for a fire burning in vegetation that is growing within 6 feet of the ground surface is shown in Figure 4. All measurements of flame length in this PFPP are shown in feet.

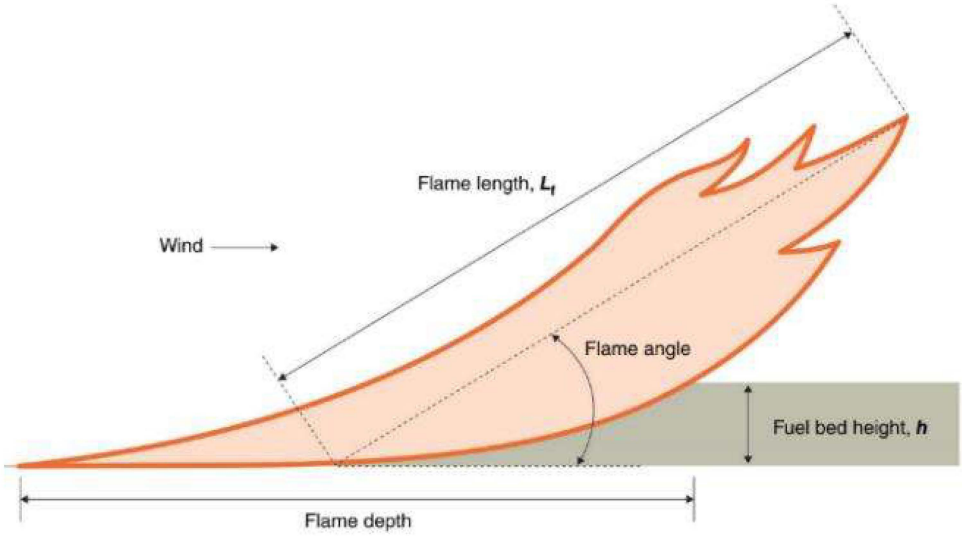


Figure 4 – Flame Length. *Flame lengths described in this plan are measured in feet. Flame length is the most critical factor as it used to determine how close to a structure the flames extend. Flame lengths can be tilted due to the effects of wind and or slope as shown in this drawing.*

Flame length and rate of spread are generally easily visualized. However, Fireline Intensity is not easily comprehended. Fireline intensity is a product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit of length of fire edge. To help visualize this parameter, the following chart is meant to help homeowners interpret the calculations:

Flame Length	**Fireline Intensity**	**Interpretation**
Feet	Btu/ft/s	
< 4	<100	Fire can generally be attached at the head or flanks by persons using hand tools or spraying water from a garden hose. Handline should hold the fire.
4-8	100-500	Fires are too intense for direct attack on the head by persons using hand tools or spraying water from a garden hose. Handline cannot be relied on to hold the fire.
8-11	500-1,000	Fires may present serious control problems – torching out, crowning, and spotting. Control efforts at the fires head will probably be ineffective.
>11	>1,000	Crowning, spotting, and major fire runs are probable. Control efforts at the head of the fire are ineffective.

Evaluating the fire behavior calculations in Section 3.1 against the above chart demonstrates that extreme fire behavior can occur under worst case weather and fuel moisture conditions within and adjacent to the Project. During high wind, flames are pushed horizontally thus causing the flames to bend over and potentially come into contact with the adjacent vegetation or structures which then can quickly ignite. With high winds, flame length is always greater than flame height.

4.0 ASSESSING STRUCTURE IGNITIONS IN THE WILDLAND/URBAN INTERFACE

Structure ignitions from wildland wildfires come from three sources of heat: convective firebrands (flying embers), direct flame impingement, and radiant heat. The BehavePlus Fire Behavior Computer Modeling Program does not address wind blown embers or firebrands from a structure ignition perspective. However, even though ignition resistant exterior building materials will be used in the construction of the development (see APPENDIX 'C' for the description of ignition resistive construction), wind driven embers and radiant heat issues are addressed in this PFPP.

4.1 Firebrands/Embers

Firebrands or embers are pieces of burning materials that detach from a burning fuel due to the strong convection drafts in the flaming zone. Embers can be carried a long distance (one mile or more) by fire drafts and strong winds. Severe wildland/urban interface fires can produce heavy showers of embers. The chance of these embers igniting a structure will depend on the number and size of the firebrand, how long it burns after contact, and the type of building materials, building design, and construction features of the structure. Embers landing on combustible roofing and decks are common sources for structure ignition. They can also enter a structure through unscreened vents, decks and chimneys, unprotected skylights, open windows, and overhangs. People who have experienced an ember shower often describe the event as much like it's snowing except instead of snowflakes, it is embers falling from the sky or being blown with the wind.



Photo 5 – Ember Shower. *Roofs that are not Class A fire rated, vents that are not ember resistant, and combustible material that is located adjacent to a home can all contribute to the loss of a structure and its contents. Note the fire on the roof and in the landscaping adjacent to the structure. Photo credit to the Insurance Institute for Business & Home Safety.*

Even with noncombustible roofing, embers landing on leaves, needles, and other combustibles located on a roof (due to lack of maintenance) can cause structure ignition. Any open windows, doors or other types of unscreened openings are sources for embers to enter a structure during a wildland fire. If these maintenance issues are addressed on a regular basis through homeowners' regular inspections, embers should not be a concern for the Project residences, as the buildings will be constructed with WUIC building materials.

4.2 Radiant Heat/Direct Flame Impingement

Radiation and convection involve the transfer of heat directly from the flame. Unlike radiation heat transfer, convection requires that the flames or heat column contact the structure. An ignition from radiation (given an exposed flammable surface) heat transfer depends on two aspects of the flame: 1) the radiant heat flux to a combustible surface, and 2) the duration (length of time) of the radiant flux. The radiant heat flux depends on the flame zone size, flame-structure distance, and how much the combustible material of the structure is exposed to the flame. While the flame from a wildfire burns between 1,600- and 2,200-degrees Fahrenheit, it is the duration of heat that is more critical. For an example, a blow torch flame typically approaches 2,100 degrees Fahrenheit, yet a person can easily pass their hand through the flame. Heat duration only becomes critical to a home with a wood exterior surface if the heat can remain for 30-90 seconds.

Research scientist Jack Cohen (retired) of the United States Forest Service has found that a home's characteristics--its exterior materials and design--in relation to the immediate area around a home within 100 feet principally determine the home ignition potential. He calls the

home and its immediate surroundings the home ignition zone. In a study of ignition of wood wallboard, tests by a USDA Forest Service research team described in the Proceedings of the 1st International Fire and Materials Conference showed that flame impingement for a sufficient length of time (approximately 1 min.) ignites a typical hardboard siding material. The likelihood of the homes' exteriors reaching ignition temperature is very unlikely due to either radiant or convective heat.

Fire agencies consider fuel modification as a principal approach to wildland fire hazard reduction. Whenever the flame length is equal to or more than the separation of combustible vegetation from a combustible structure for 1-2 minutes in duration or more, there is a high probability of structure ignition. The combination of strong winds and flames causes flames to bend with the wind as seen in Photo 6. Buildings are typically not designed to withstand direct flame impingement. Contact with a fire's convection heat column may also cause ignition but the temperature of the column's gases generally is not hot enough or long enough in duration to sustain the ignition of the structure.



Photo 6. High Winds Effect on Fire Behavior*. Wind will bend flames over and enhance fire spread. If a building is in close proximity, there could be direct contact with the flames which could easily ignite the adjoining structure. Flame/structure contact is also likely to break windows thereby allowing both embers, radiant, and convective heat to enter the structure.*

Comparing the expected wildland fire behavior projections in each of the scenarios in Section 3.1 against the required fuel modification zones described in Section 7.0, demonstrate substantial reductions in the expected flame length and fireline intensity.

By requiring the structures exposed to the threat of wildfire to incorporate the following guidelines, those structures will be provided with the most effective measures for minimizing losses from flame impingement and associated radiant heat intensities.

- Each structure is constructed of ignition resistant building materials as required by the WUIC.
- The area surrounding each structure contains Zone 0, an ember resistant zone followed by an irrigated Zone (defensible space) and a Thinning Zone (low fuel volume buffer strip) between the irrigated zone and the untreated wildland fuels.

Each eventual homeowner shall be required to maintain their properties to fuel Modification standards Zones 0 and 1A. Residents shall keep their home's roof and any rain gutters free of leaves, needles, and other combustible debris. All firewood and other combustible materials must be properly stored away from structures so that burning embers falling on or near structures have no suitable host. The Project lot owners are responsible for maintaining their homes and for keeping all doors and windows tightly closed whenever a wildland fire is reported in the vicinity.

5.0 FIRE DEPARTMENT RESPONSE TIMES

The proposed Project is within the Riverside County Fire Department's response area. RCFD Station #83 located at 37500 Sky Canyon Dr, Murrieta, CA is approximately 4.6 miles and nine (9) minutes driving time to the furthest point in the development. Riverside County Fire Station #34 located at 32655 Haddock St, Winchester, CA is approximately 5.8 miles and nine (9) minutes driving time to the furthest point in the development. The third closest Fire Station is Murrieta Fire Department Station #2 located at 28155 Baxter Road, Murrieta, CA is approximately 6.7 miles and 12 minutes away. Additional agencies such as nearby cities would also respond equipment under mutual aid agreements but would likely arrive after RCFD engines were on-scene. It should also be noted that the Cal Fire Ryan Air Attack Base is in nearby Hemet, approximately 8 air miles from the Project. The Air Attack Base could respond with fire retardant tankers or helicopters if available.

Although RCFD Fire Station #83 and #34 engines may be 9 minutes away, there is no assurance that either engine company will be in their station on the day a wildfire threatens the Project. Engines may respond from other stations located further away or from other incidents. On days with extreme fire danger, there may be multiple fire starts and engine companies deployed on other incidents. This is why firewise planned projects use *"defensible space"*, ignition resistant building features, and key fuel modification strategies that enable residents to substantially increase their ability to survive a wildfire on their own if necessary, without the loss of their structure. The goal of this PFPP, therefore, is to make the Project and its occupants as safe as possible and able to survive on their own until firefighting equipment arrives and/or residents are safely evacuated.

6.0 LANDSCAPE PLANS

Landscape architects, designers, and lot owners should consult with the RCFD for recommendations involving appropriate plants for Zone 1 if there is a concern about its fire resistance. Avoid the use of all plants found in Appendix "A". Landscape Plans need to follow the California requirements and use fire-resistant plants such as those shown in Photo 7.



Photo 7 – Succulents. *Succulents are a group of plants known for their high moisture content and therefore are more likely to be cooked than burn when exposed to wildfire.*

6.1 Plant Species Section

The trees, plants, shrubs, vines, and ground covers, including native vegetation, proposed for use as landscaping in the Project are required to be in accordance with the following:

i. Appropriate for Climate Zones 18 and 19 as determined by *Western Garden* published by Sunset Books.
ii. Appropriate for California Irrigation Management Information System (CIMIS) Evapotranspiration Zone 9.
iii. Have a Region 4 Water Use Classification of Landscape Species (WUCOLS) classification of Low or Very Low based on WUCOLS IV, 2014. See https://ccuh.ucdavis.edu/wucols for additional information.
iv. Not determined by any standard or classification to be invasive.

Applying the above requirements lessens the chance that a plant will die due to either freezing or heat stress and not spread beyond the landscape where it is planted.

6.2 California Landscape Plan Requirements

Per the WUIC, Section 603.3, the landscape plan shall include the development and maintenance requirements for the vegetation management zone adjacent to structures and roadways and provide significant fire hazard reduction benefits for public and firefighting safety. The contents of the landscape plan shall contain the following:

1. Delineation of the 30-foot and 100-foot fuel management zones from all structures.
2. Identification of existing vegetation to remain and proposed new vegetation.
3. Identification of irrigated areas.
4. A plant legend with both botanical and common names, and identification of all plant material symbols.
5. Identification of ground coverings within the 30 feet zone.

Vegetation

All new vegetation shall be fire-smart vegetation in accordance with this section.

> **Exception:** Trees classified as nonfire-resistant vegetation complying with Section 603.4.2.1. To be considered fire-smart vegetation, it must meet at least one of the following:
>
> 1. Be identified as fire-smart vegetation in an approved book, journal or listing from an approved organization.
> 2. Be identified as fire-smart vegetation by a licensed landscape architect with supporting justification.
> 3. Plants consider fire-smart vegetation and approved by the local enforcing agency.

Shrubs

Per Section 603.4.1 Shrubs, all new plantings shall comply with the following:

- Shrubs shall not exceed 6 feet in height.
- Groupings of shrubs are limited to a maximum aggregate diameter of 10 feet.
- Shrubs groupings shall be separated from other groupings a minimum of 15 feet.
- Shrub groupings shall be separated from a structure by a minimum of 30 feet.
- Where shrubs are located below or within a tree's drip line, the lowest tree branch shall be a minimum of three times the height of the understory shrubs or 10 feet, whichever is greater.

Trees

Per Section 604.4.2 Trees, trees shall be as follows within the 30-foot zone of a structure:

1. New trees shall be planted and maintained so that the tree's drip line at maturity is a minimum of 10 feet from any combustible structure.
2. The horizontal distance between crowns of new trees and crowns of existing adjacent trees shall not be less than 10 feet.

3. Existing trees shall be trimmed to provide a minimum separation of 10 feet away from any chimney and stovepipe outlets per Title 14, Section 1299.03.

Non-Fire-Smart Vegetation
Per Section 603.4.2.1, new trees not classified as fire-smart vegetation, such as conifers, palms, pepper trees and eucalyptus species, shall be permitted provided the tree is planted and maintained in accordance with one of the following:

- The tree is planted so that the tree's drip line at maturity is a minimum of 30 feet from an applicable building.
- The tree is planted so that the tree's drip line at maturity is a minimum of 10 feet from any combustible structure and is well pruned and maintained so as not to form a means of rapidly transmitting fire from other nearby vegetation to the structure or from the structure to nearby vegetation or to interrupt the advance of embers toward a structure.

Outbuildings
Per Section 604.4 of the WUIC, outbuildings shall have a minimum clearance of 10 feet down to bare mineral soil in all directions. Vegetation more than 10 feet but less than 20 feet from outbuildings shall be fire-smart vegetation.

Note that the CFC defines an outbuilding as buildings or structures that are less than 120 square feet in size and not used for human habitation. When a structure exceeds 120 square feet (typically sheds and garages) it is referred to as an accessory structure and will need to be built to the requirements of the WUIC.

6.3 Fire Resistant Plant Palette
Wildland fire research has shown that some types of plants, including many natives, are more fire resistant than others. These low fuel volume, non-oily, non-resinous plants are commonly referred to as "fire resistant." This term comes with the proviso that each year these plants are pruned, all dead wood is removed, and all grasses or other plant material are removed or treated from beneath the circumference of tree and shrub canopies. Some native species are not considered "undesirable" from a wildfire risk management perspective provided they are properly maintained year-round. Refer to APPENDIX 'A' for a list of prohibited plant species.

The RCFD does not have a list of approved fire-resistant plants for fuel modification zones. The trees, shrubs, vines, succulents, and ground covers, including native vegetation, proposed for use as landscaping in fuel modification zones shall be in accordance with two or more of the following publications:

- https://www.firefree.org/wp-content/uploads/2016/02/Fire-Resistant-Plants.pdf
- https://firesafesdcounty.org/wp-content/uploads/2017/05/Comprehensive-Fire-Resistant-Plant-List.pdf
- https://fire.lacounty.gov/wp-content/uploads/2020/05/Plant-Selection-Guidelines.pdf
- https://vcfd.org/wp-content/uploads/2020/02/PlantReferenceGuide.pdf
- https://www.firesafemonterey.org/plant-lists.html#table1
- https://sbcfire.com/wp-content/uploads/2022/08/2015_Beneficial_plant_list-1.pdf

7.0 FUEL MODIFICATION ZONE DESCRIPTIONS AND RECOMMENDED TREATMENTS

Below are the descriptions and required treatments for the Fuel Modification Zones. All distances in this report are measured horizontally. These distances are depicted on the Fuel Modification Map (Section 12.0). With the exception of Lots 19, 40, 41, 64, and 98-102, Fuel Modification Zones 1A, 1B, and 2A, 2B, and 2C **co**mbine to provide 100 feet of treated area depending which is more than sufficient to mitigate the radiant heat effects and direct flame impingment of a wildland fire with expected flame lengths in treated fuels of between 5.3 and 8.5 feet.

Due to protected open space and habitat restrictions Lots 19, 40, 41, 64, and 98-102 have reduced fuel modification distances. Therefore additional construction requirements shall be required on these lots as outlined in Section 8.0 to mitigate for the reduction in fuel modification. Fuel modification together with the required ignition resistant construction and additional construction feature requirements should provide for sufficient protection from radiant heat and direct flame impingement on these lots.

The homeowners shall be responsible for maintaining Fuel Modification Zones on their lots. Responsibility for maintaining Fuel Modification Zones outside homeowner lot boundaries are listed below. In the event a home is repossessed, the unit/agency holding title to the lot will be responsible for the maintenance on the lot.

7.1 Ember Resistant Zone 0 (Lot Owner Maintained) - *(Not Shown on the Fuel Modification Plan Map Exhibit)*

Defined

Zone 0, aka an ember resistant zone, is part of what is commonly called the defensible space zone and shall be an area free of all combustible materials including plants. It also includes outside buildings, attached decks and stairs. The intent of this zone is to significantly reduce the probability of fire coming in contact with a structure, especially from accumulating wind blow embers and combustibles located around the base of each structure. The lot owner shall be responsible for its maintainence. Within this zone the goal is to establish and maintain the area per the requirements described below.

Zone 0 Requirements

- Absent of natural fiber, wood, and rubber mulch.
- Absent of artificial turf.
- Not contain combustible fences or gates.
- Not contain combustible decorative items and outdoor furniture.
- Shall not contain firewood piles regardless of the diameter or dimension of the wood stored.
- Clear of yard maintenance equipment with flammable components.
- Absent vehicles of any kind.
  Exception: Does not apply to automobiles and pickup trucks parked in a driveway.
- Absent of exercise or fitness equipment with combustible components.
- Absent of any item that in whole or in part has an ignition temperature less than 900 degrees F or 500 degrees C.

- Contain noncombustible materials such as bare ground, decorative rock, gravel, decomposed granite, concrete, pavers, statuary, and water features.

Required Maintenance

- Remove any combustible material monthly within Zone 0 including all dead vegetative matter.
- Remove any combustible material quarterly in rain gutters located above Zone O.
- Remove vehicles of any kind, exercise equipment, yard maintenance equipment that are stored within Zone 0.
  Exception: Does not apply to vehicles parked in a driveway.
- Remove any item that in whole or in part has an ignition temperature less than 900 degrees F or 500 degrees C including holiday decorations.

7.2 Fuel Modification Zone 1A - Lot Owner Maintained *(Shown as No color on the Fuel Modification Plan Map)*

Defined

Fuel Modification Zone 1A is an irrigated zone, commonly called the defensible space zone, and shall be free of all combustible construction and materials. It is measured from the exterior walls of the structure or from the most distal point of a combustible projection, an attached accessory structure, or an accessory structure within 10 feet of a habitable structure to the lot boundary. It provides the best protection against the high radiant heat produced by a wildfire and is generally an open area in which fire suppression forces can operate during wildfire events. This zone includes a level or level-graded area around the structure.

Required Landscaping

- Plants in this zone need to be fire resistant and shall not include any pyrophytes that are high in oils and resins such as pines, eucalyptus, cedar, cypress or juniper species.

- Plants used in fuel modification Zone 1A should exhibit the following qualities to be the most "fire resistant": thick, succulent or leathery leaf species with high moisture content; tendency to produce limited litter; the presence of high salt levels or similar compounds which may contribute to fire resistance; ability to withstand drought and frost; and the ability to withstand severe pruning. See Section 6.3 – Fire Resistant Plant Palette.

- Zone 1A will be cleared of all fire prone and undesirable plant species (see APPENDIX 'A').

- Landscape designs that use hardscape features such as driveways, swimming pools, concrete, rock, pavers, and similar non-combustible features that break up fuel continuity within Zone 1A are encouraged.

- Limit the use of groundcovers (mature plants of $\leq$ 12 inches) of a single species to 250 square feet to break up fuel continuity. Between species, if possible, incorporate hardscape features such as noncombustible mulch, walkways or similar features.

- Avoid planting trees and shrubs in rows or hedges that provide an uninterrupted path for fire.

- Shrubs taller than 12 inches may be planted in groups when separated from a structure by a minimum of 30 feet. The group is limited to a maximum aggregate diameter of 10 feet.

- Horizontal space between plants depends on the slope of the land and the height of the shrubs or trees. Leave more space between vegetation on steeper slopes. Refer to the Figure 5 below to determine spacing distances.

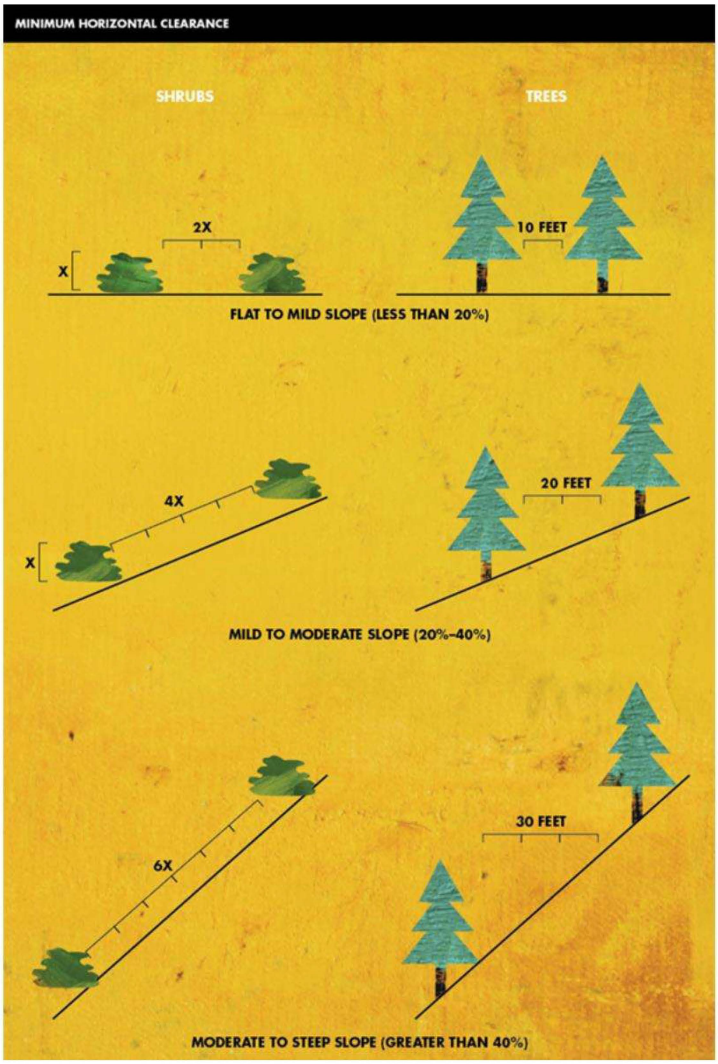


Figure 5 - Minimum Horizontal Clearance Distances. *Examples of shrub and tree separation.*

- Shrub groupings shall be separated from a structure by a minimum of 30 feet.

- Trees are to be planted such that the mature canopies will be at least 10 feet from the exterior walls of the structure or from the most distal point of a combustible projection, an attached accessory structure, or an accessory structure within 10 feet of a habitable building.

- Where shrubs are located below or within a tree's drip line, the lowest tree branch shall be a minimum of three times the height of the understory shrubs or 10 feet, whichever is greater.

- Plants located beneath trees shall not be taller than 18 inches to signficantly reduce the likelyhood of the creation of ladder fuels.

- Vines may be grown on noncombustible trellises as long as the trellis is located 10 feet or more from the exterior wall of a structure.

- A single non-fire-smart accent tree, including those species listed in Appendix 'A', may be installed provided the tree is planted and maintained in accordance with one of the following:

    1. The tree is planted so that the tree's drip line at maturity is a minimum of 30 from an applicable building.
    2. The tree is planted so that the tree's drip line at maturity is a minimum of 10 feet from any combustible structure and is well pruned and maintained so as not to form a means of rapidly transmitting fire from other nearby vegetation to the structure or from the structure to nearby vegetation or to interrupt the advance of embers toward a structure.

- Biodegradable jute netting, nylon, or polyethylene mesh erosion control products and hydroseed (standard mulch) may be installed in Zone 1A for initial plant establishment (one time installation by the developer/builder) on slopes to reduce erosion and moisture loss when located over 10 feet from any structure. During initial plant establishment, plant debris and other combustible materials are absent within 50 feet of a structure.

- Irrigated planted slopes, without a wall between the home and planting area, in Zone 1A (one time installation by the developer/builder) may utilize bonded fiber matrix (BFM) and biodegradable jute netting to stabalize slopes. The netting and bonded fiber matrix will typically fully decompose in 6 - 24 months. BFM's binding agents make it more challenging than standard mulch to ignite and spread fire. Due to irrigation, the moisture content in the BFM will significantly reduce the possibility of ignition from embers.

- Excelsior netting, straw blankets or waddles, and similar highly combustible erosion control products are prohibited within 100 feet of any structure as they tend to ignite readily and produce significant numbers of embers while burning.

- Drip irrigation may be utilized to reduce water use, prevent disease by minimizing plant water contact, and allows for the space between plants to remain dry thus reducing weed growth.

- Artificial turf may be installed as a plant substitute when the turf material is installed on sand or similar noncombustible material and passes the ASTM D2859 Standard Method for Ignition Characteristics of Finished Textile Floor Covering Materials.

- At mature growth, single shrub crowns shall be separated horizontally from each other by at least five (5) feet.

- Containers used to grow plants shall be of noncombustible materials such as clay, metal, or concrete. Combustible pots such as wooden barrels have been known to ignite in rare instances due to spontaneous combustion of decomposing potting soil, especially in outdoor environments where they are exposed to higher temperatures and dry conditions (Photo #11). Potting soils are composed of peat moss, shredded wood, bark and vermiculite, all combustible products. To reduce the risk of spontaneous combustion or ignition from embers, keep potting soil moist and blend it with native soil.



Photo 11 – Spontaenous Combustion. *Though rare, plants growing in potting soil can spontaeously combust resulting in a fire. Shown above is a wine barrel used for a plant container which was burned due to burning potting soil. Potting soil is combustible product, especially outdoors unless properly treated and maintained. Photo Credit: Savannah Harrison of KY3 TV, Springfield Missouri.*

Required Maintenance

- Lots shall be maintained year round by the individual property owners within their property boundary (lot lines) into perpetuity as required by this FPP and the BFD and RCFD.
- Remove dead limbs or shedding bark from the canopy of trees and shrubs monthly.
- Remove and replace any dead or dying plant material monthly.
- Where shrubs are located below or within a tree's drip line, the lowest tree branch shall be a minimum of three times the height of the understory shrubs or 10 feet, whichever is greater.
- Irrigation systems shall be tested for proper coverage and flow rates bimonthly.
- Irrigation systems shall not be turned off other than for required maintenance and or during periods of extended rainfall. Restart the system when the soil dries out.
- Trees growing over Fire Access Roadways shall be maintained to have a vertical clearance between the roadway and tree canopy of a minimum of 13 feet 6 inches.
- Maintain the height of shrubs located beneath trees to not exceed 18 inches in height to prevent ladder fuels.
- All trees and shrubs must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)] See link below:* *https://www.tcia.org/TCIA/Build_Your_Business/A300_Standards/A300_Standards.aspx*
- Debris and trimmings produced by thinning and pruning operations shall be removed from the lot/property.
- Firewood and similar combustible materials shall not be stored outdoors within 30-feet of any structure. It may be placed inside a fully enclosed noncombustible building or storage shed.

7.3 Fuel Modification Zone 1B HOA Maintained (Shown as *Green* *on the Fuel Modification Plan Map).*

Defined

A common area planted and maintained to the criteria described in Section 7.2. The zone shall extend a minimum of 30 feet from exterior walls of the adjacent structure as shown on the Fire Protection Plan (See Section 12.0). It also includes all manufactured slopes regardless of their distance from a structure. Zone 1B shall be planted with fire-resistant/smart vegetation and maintained to Irrigated Zone 1A criteria described in Section 7.2.

Required Landscaping

Same as Zone 1A

Exception - Vines:

Vines may be installed for privacy, sound deadening, or to reduce or hide graffiti on a noncombustible wall when;

1) They are grown 20 feet or more away from a structure, and

2) Grown on the side of the wall that faces away from any nearby structure.

Exceptions – Combustible Mulch & Erosion Control Products Use on Slopes:

- Composted wood chips or Tahoe chips (See Figure 5), applied as a single layer of mulch of not more than 3 inches in depth, may be placed in Zone 1B to reduce soil erosion and reduce weed growth when all the following conditions are met:

  a. Wood mulch shall only be allowed if treated with fire retardant in an approved manner that is acceptable to the Riverside County Fire Department.
  b. There is a 6-foot or greater in height solid noncombustible wall located between the area where the mulch is to be spread and a home/building.
  c. The area is located over 20 feet from any structure.

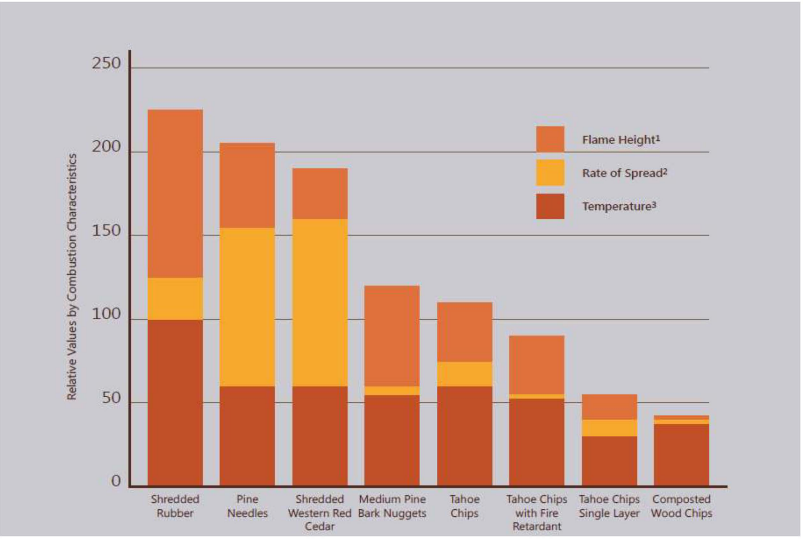


Figure 5 – Relative Values of Three Combustion Characteristics of Mulch. *Eight mulch types are shown. The average maximum flame height, average rate of fire spread, and average maximum temperatures were measured at 4 inch above a bed of each burning mulch. Chart obtained from Quarles, The Combustibility of Mulches.*

- Biodegradable jute netting, nylon, or polyethylene mesh erosion control products and hydroseed (standard mulch) may be installed in Zone 1B for plant establishment (one time installation by the developer/builder) on slopes to reduce erosion and moisture loss when located over 20 feet from any structure.

- Irrigated planted slopes, without a wall between the home and planting area, in Zone 1B (one time installation by the developer/builder prior to homeowner occupancy) may utilize bonded fiber matrix (BFM) or BFB with biodegradable jute netting to stabalize slopes. The netting and bonded fiber matrix will typically fully decompose in 6 - 24 months. BFM's binding agents make it more challenging than standard mulch to ignite and spread fire.

- Excelsior netting, straw blankets or waddles, and similar highly combustible erosion control products are prohibited within 100 feet of any structure as they tend to ignite readily and produce significant numbers of embers while burning.

Note: If available, landscaping may be irrigated with reclaimed water. In the future, should water for irrigation from potable water sources become restricted, reclaimed water may be a more dependable source. It will generally result in faster plant growth due to the presence of nutrients like nitrogen and phosphorus in reclaimed water. This could result in increased landscape maintenance costs.

7.4 Fuel Modification Zone 1C – Riverside County Community Facilities District Maintained (Shown as *Blue* on the Fuel Modification Plan Map).

Defined

Common area planted and maintained to the criteria described in Section 7.3. The only difference in this zone from Zone 1B is that it is maintained by the County of Riverside/Valley-Wide Recreation and Park District. It is found within and around detention basins.

Required Landscaping

Same as 7.3

Required Maintenance

Same as 7.3

7.5 Fuel Modification Zone 2A – HOA Maintained *(Shown as Orange on the Fuel Modification Plan Map)*

Defined

Fuel Modification Zone 2A is a transition area between the strict requirements of irrigated Zones 1A, 1B, or 1C and undisturbed native vegetation. Zone 2A is a non-irrigated thinning zone that varies in width, depending on location and begins at the outer edge of Irrigated Zone 1A, 1B, or 1C landscaping. The outer edge of the zone is 100 feet from any structure. Thinning zones are utilized to reduce the fuel load of a wildland area adjacent to urban projects thereby reducing the radiant and convective heat and flame lengths of wildland fires. The intent is to achieve and maintain an overall 50 percent reduction of the canopy cover spacing and a 50 percent reduction of the original fuel loading by reducing the fuel in each remaining shrub or tree without substantially decreasing the canopy cover or the removal of soil holding root systems. If 100 feet of fuel modification cannot be established for any home, see Section 8.0 – Construction Requirements.

Required Landscaping

- Thinning the native vegetation to a point where 50% open space is created.
- Removal of all dead woody debris and exotic or native flammable vegetation (see APPENDIX 'A').
- Allowances for the needs of protected species and habitats will be considered in this zone.
- No combustible construction or materials are allowed in Zone 2A.

Required Maintenance

- Annually maintain all tree crowns to keep a separation of six feet between the ground fuels (shrubs and ground covers) and the lower limbs.
- All trees must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)]* (see *http://www.tcia.org/TCIA/TCIA/BUSINESS/A300_Standards/A300_Standards.aspx*
- Annually prune vegetation to maintain a 50% thinning from the original vegetation cover.
- Native and exotic annual and perennial grasses will be allowed to grow and produce seed during the winter and spring. As grasses begin to cure (dry out), they will be cut or mowed to 4 inches or less in height.
- Annually remove all dead and dying vegetation and highly flammable exotic species (see APPENDIX 'A')

7.6 Fuel Modification Zone 2B – County of Riverside/Valley-Wide Recreation and Park District Maintained Maintained *(Shown as Gray on the Fuel Modification Plan Map)*

Defined

Zone 2B is a common area that shall be maintained by the County of Riverside/Valley-Wide Recreation and Park District. All of this zone is located within a future park that is located in the center of the Project. The zone begins at the outer edge of Roadside Fuel Modification.

Required Landscaping

Same as Section 7.5 except that it covers the entire future park area.

Required Maintenance

Same as Section 7.5

7.7 Fuel Modification Zone 2C – Riverside County Community Facilities District Maintained *(Shown as Red on the Fuel Modification Plan Map)*

Defined

Zone 2C is an area that shall be maintained by a Commuunity Facilities District and that is located in and adjacent to a detention basin. It shall be landscaped and maintained per Section 7.5. The zone shall begin at the outer edge of a Zone 1C or a Roadside Fuel Modification Zone. The outer edge of the zone shall be 100 feet from any structure.

Required Landscaping

Same as Section 7.5

Required Maintenance
Same as Section 7.5

7.8 Roadside Fuel Modification – HOA Maintained *(Shown as Purple on the Fuel Modification Plan Map*).
All publicly accessible roads within the residential areas of the Project shall be cleared of all combustible vegetation for a minimum of 20-feet on each side of the roadway and landscaped per the criteria outlined in Fuel Modification Zone 1A. Sidewalks and related non-combustible improvements may be placed in this zone to further increase the level of protection. The purpose of this action is to minimize the cutting-off of workers, homeowners, and guests from safely evacuating the area due to a wildland fire occurrence and for safe ingress by emergency responders.

Required Landscaping
Same as Fuel Modification Zone 1A – Section 7.2 with the following additional requirement:

- The Project Landscape Architect shall design the irrigation system for roadside fuel modification to be on its own independant irrigation zone. This will allow for other zones to be shut down independently from the Roadside Fuel Modification should water availability for landscape plants become an issue.
- Reclaimed water is acceptable for irrigation and is encouraged.

Required Maintenance
Same as Irrigated Zone 1A – Section 7.2 including the following additional requirement:

- Irrigation shall not be shut down except for necessary system repairs and maintenance.

7.9 Restricted Building Zone – *(Shown in Yellow on the Fuel Modification Plan Map).*
An area where no combustible construction including the home shall be built. This area is suitable for pools, gardens, recreational uses and similar features. The zone shall be a minimum 10 feet from the rear lot line. This area is needed to create/maintain space between the protected open space and habitable structures.

7.10 Zone Markers
The exterior boundary of Fuel Modification Zone 2A, 2B and 2C shall be marked on the ground for the purpose of guiding annual fuel Modification maintenance, inspection operations and protection of habitat along the northern Project boundary and along the western boundary. The most reliable markers are steel fence posts with a baked on painted finish. The upper half of the above ground portion of the fence post is then painted a bright “day glow” orange to improve visibility. These Fuel Modification Zone markers must be spaced so that the markers on each side of an installed marker can be seen from the next marker. See Appendix ‘D’ for a drawing of a Zone Marker Detail.

8.0 CONSTRUCTION REQUIREMENTS

All structures within the Project shall meet all wildland/urban interface standards to the satisfaction of the RCFD. Structured shall be designed and constructed with ignition resistant construction materials and shall meet the California Fire and Building Codes; Wildland-Urban Interface Code; and all current codes in force at the time of permit application. For a summary of the current construction requirements as of the date of this report, see APPENDIX 'E'. The fire protection features described herein shall be maintained to be equivilent or greater ignition resistance. Any damaged or replacement window, siding, roof covering, or noncombustible wall will meet or exceed the original intent of the fire protection discussed in this plan.

All non-habitable accessory structures such as decks, balconies, patio, covers, gazebos and fences shall be built from non-combustible materials. Lot owners are not restricted from having concrete patios, concrete walkways or swimming pools within Fuel Modification Zone 1A in compliance with other codes.

8.1 Pre-Construction Requirements

Per Riverside County Guideline OFM-01A, the following shall be provided prior to construction:

- Water and power utilities shall be installed by the developer and approved by the appropriate inspecting department or agency.
- An inspection shall be scheduled with the Riverside County Fire Department, Office of the Fire Marshall to verify that access roads and other access features have been provided for buildings under construction.
- For projects with fuel modification, a vegetation clearance inspection is required.
- All gates in construction fencing shall be equipped with either a Knox or breakaway padlock.
- The Project address shall be clearly posted and visible from the public roads during construction.

8.2 Additional Construction Requirements – All Lots

In the event of a wildfire in the adjacent wildlands the structures in the Project will be showered with embers. To mitigate this hazard the following additional construction requirements shall be implemented on all lots within Project.

- All operable windows shall be provided with metal mesh bug screens or similar noncombustible screens over the operable opening to replace traditional vinyl bug screens to prevent embers from entering the structure during high wind conditions when windows may be inadvertently left open.
- All houses shall have automatic door closers on all vehicle garage doors (standard on most new automatic garage door openers as a security feature), that can be set to close after a certain period of time with no activity.

- Solar panels installed on a roof shall be enclosed with 1/4 inch or finer noncombustible and corrosion resistant mesh to prevent the accumulation of leaves, twigs, and other combustibles, especially during strong winds. This mesh shall be run along the perimeters of the solar array to stop birds and rodents from accessing the warm protected underside wiring. It shall also prevent these animals from building nests beneath the panels which could be ignited by embers.

- Decks that are not attached to a home that are less than 4 inches above the ground shall be enclosed with 1/8 inch or finer noncombustible and corrosion resistant mesh to prevent embers from collecting beneath the deck.

8.3 Additional Construction Requirmeents – Specific Lots.
In addition to the requirements stated above, the following additional construction requirements shall be applied to the homes built on Lots 19, 40, 41, 64, 65, 97-102 to mitigate for reduced or modified fuel modification zones.

1. Interior fire sprinklers shall be installed in the attics and garages (See Figure 5). Listed domestic demand shutoff valves may be used to try to minimize upgrading meter sizes where possible. Copper piping or an equivalent noncombustible pipe is required in the attics; Chlorinated polyvinyl chloride (CPVC) pipe will only be permitted in the attic if listed heads are used in accordance with their listing.

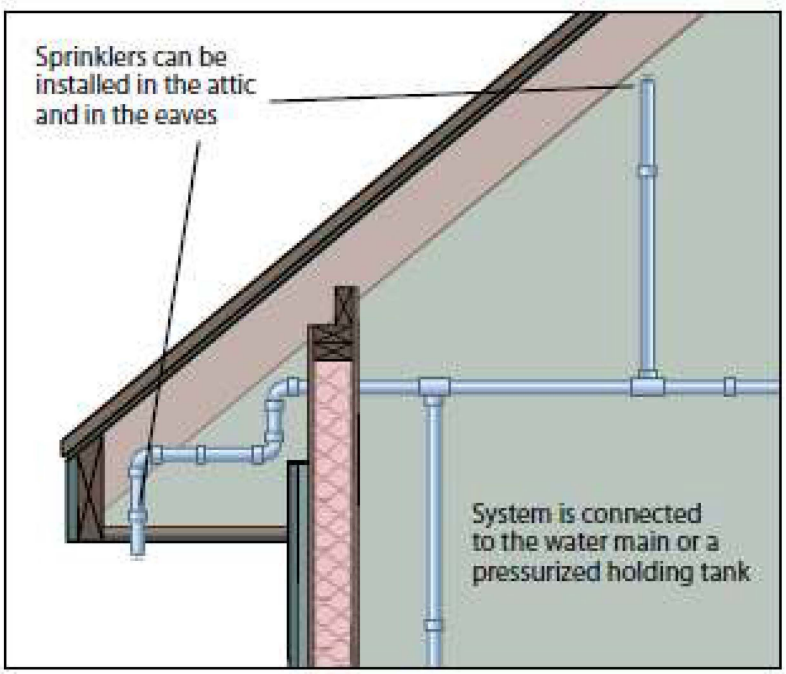


Figure 5 – Interior Sprinklers Installed in the Attic.

2. All swinging exterior doors facing wildland fuels shall have a 45-minute fire rating, be self closing (e.g., pneumatic or spring loaded hinges), and self-latching.

3. Fire sprinklers shall be extended outside under the eaves facing wildland fuels according to NFPA 13D (See Figure 5). Where possible, locate sprinkler heads above windows.

4. The homes on these lots shall be single story.

5. A eight (8) foot solid non-combustible radiant heat wall shall be installed on the northern lot boundaries, as shown on the Fuel Modification Plan to aid in radiant heat deflection and mitigate any reduced fuel modification restrictions. The upper half of said wall may be a view wall where tempered fire-rated glass is utilized as long as the wall remains solid and noncombustible (See Appendix 'E' for an example). Post and glass frame assemblies shall be composed of metal such as steel, and 6063-T5 aluminum alloys or equivalent, respectively, which will not melt and allow the glass to fall out.

   Any gate placed within a solid noncombustible wall shall also be constructed of noncombustible materials and the same height as the wall. The opening around the gate including its base shall not exceed ½ inch.

A solid wall located at the top of slopes or on flat land on the property line away from a home will have a tremendous impact on radiant and convective heat, ember collection, and reduction in wind speeds that reduces fire behavior. These impacts are demonstrated in Figure 6.

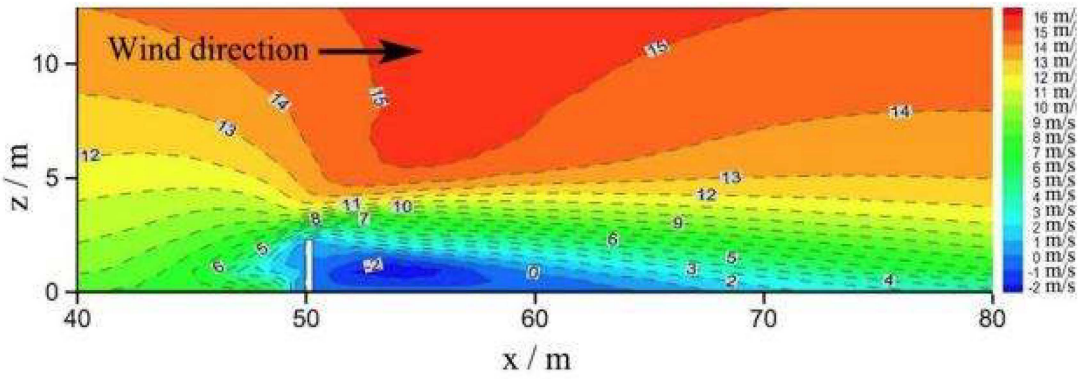


Figure 6 – Impacts on Wind Speed and Ember Deposition Resulting From a 2 meter (6+-foot Wall). *The above diagram is based on a wind speed of 14 m/s (31 MPH). Note that the wind, both on the windward and leeward sides of the wall, is reduced. These areas will thus trap embers and blowing debris (area shown in blue and light green). The wind speed on the windward side of the wall is significantly reduced for a distance equal to several times the height of the wall. This reduces fire behavior including flame length, a critical factor in fire protection planning. The above diagram was created for the purpose of demonstrating the impact of a wall on snow deposition and wind speeds but is also applicable to ember deposition and wind speeds. Ref: Dong et al., 2007*

8.4 Analysis of Fire Behavior – Lot 97

The lot of greatest concern within the Project is the home to be located on lot 97. Between the Project boundary and the home there is but 29 feet. The worst case fire behavior without any mitigation is 47.5 feet, Fire Scenario #2. Without additional mitigation, there could be flame/structure contact. One of the development requirements is to provide a 8-foot tall solid

wall on the boundary with the MSHCP protected habitat. Within this plan, walls established for fire protection purposes shall be solid and noncombustible which will modify fire behavior. Firewise2000, LLC is taking credit for this wall as an additional mitigation measure.

The impact of the 8-foot solid noncombustible wall located on the Project boundary at the top of the slope (See Figure 7) on Lot 97 was assessed as the wall will modify fire behavior by reducing the wind speed by a minimum of 50 percent as demonstrated in Figure 6. Firewise2000, LLC used the worst-case fire behavior worksheet for the eastern exposure and using the same input parameters calculated the fire behavior for the same conditions with only the wind speed being reduced from 60 to 30 MPH to represent the impact of the wall. The result of this scenario is shown as Fire Behavior Scenario #5 in Appendix I. The fire behavior is significantly reduced in the presence of a wall to 35.7 feet. It also must be remembered that this fire behavior is for a location 6 feet north of the wall, not at the wall's location. Its benefits are therefore greater than just the direct flame length reduction.

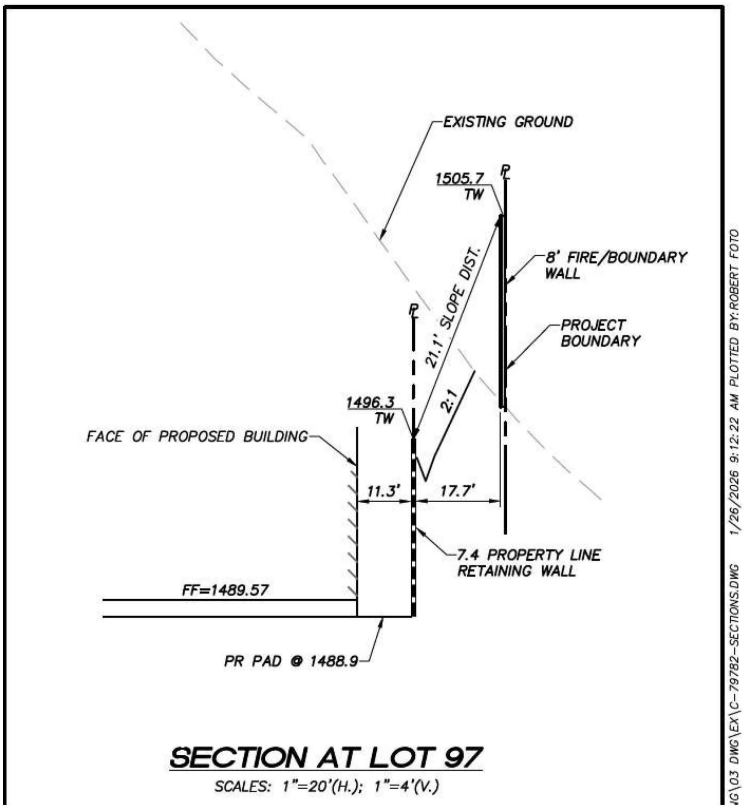


Figure 7 – Home Location Relationship to Project Boundary

Fire Scenario #5 (Eastern Boundary With 8 Foot Wall) ***Fire Approaching from the East*** ***(Late Fire Season With 30 MPH East Wind Condition)***	
Fire Behavior Calculation Input Data • **30 percent slope** • **30 mph 20-foot wind speed** • **70° slope aspect from north** • **225° wind direction from north**	**Anticipated Fuel Moistures** *** 1-Hour Fine Fuel Moisture of……...2%** *** 10-Hour Fuel Moisture of……..…2%** *** 100-Hour Fuel Moisture of.....……..…..4%** *** Live Herbaceous Fuel Moisture of…....30%** *** Live Woody Fuel Moisture of…….....45%**
Expected Fire Behavior **Combined Fuel Model [GR2 – Low Load, Dry Climate Grass 80% and Fuel Model SCAL18 – Sage/Buckwheat 20%]**	
Rate of Spread - 254 ft/min	
Fireline Intensity - 13,474 BTU/ft/s	
Flame Length - 35.7 feet	

Based on Figure 7 and only assessing horizontal distances, the amount of space available for fuel modification is:

1. Rear Yard Setback	11.3 feet
2. Rear PL to Project Boundary	17.7 feet
3. Fire Behavior Initiation Point (East of Wall)	6.0 feet
Total Separation:	35.0 feet

As the home built on lot 97 will be located below the top of the 8-foot wall, slope distance should also be considered. Below, using the data in Figure 7 is that calculation:

1. Rear Yard Setback	11.3 feet
2. Rear PL to Project Boundary Slope Distance	21.1feet
3. Fire Behavior Initiation Point (East of Wall)	6.0 feet
Total Separation:	38.4 feet

Based upon the projected worst case fire behavior, flame/structure contact is avoided due to the combination of the setback, requirement that the home on lot 97 be single story, and an 8-foot solid wall being located on the Project boundary (35.7-foot flames length in Fire Scenario #5 and the above separation analysis). Note: the wind speed adjustment was based on a 6-foot wall shown in Figure 6. This analysis should be considered conservative as an 8-foot wall shall provide additional benefits including the reduction of wind speed further to the upwind side of the wall. Firewise2000, LLC has also considered that during a wildfire that flames and heat rise as hot air is less dense than surrounding air plus the fact that the home will be located below the height of the noncombustible wall which provides additional shielding, and the inclusion of the additional building features listed in Section 8.3 provide significant protection for the home built on lot 97.

9.0 INFRASTRUCTURE

The basic systems needed to develop a property and support its use by its residents and businesses. For fire protection planning, these typically consist of the water supply for fire hydrants and fire sprinkler systems and accessways to and from the property.

9.1 Water Supply

The Eastern Municipal Water District (EMWD) will provide the Project with potable water. Hydrants, mains and water pressures shall be designed to comply with RCFD requirements. The developer shall provide an approved permanent water supply, including fire hydrants, capable of supplying the required fire flow for fire protection of both residential and commercial construction prior to any combustible material being placed on the site or the commencement of construction. The water supply system shall be a looped system served from two points.

Water supplies for fire protection and hydrants shall be in accordance with RCFD codes. The minimum size of water distribution mains on which fire hydrants are located shall be sufficient to provide the required fire flow but in no case less than eight-inch in diameter and designed to be a circulating (loop) for the mains.

Fire hydrants spacing shall not exceed 300 feet and are required on cul-de-sacs 300 feet or more in length. The size, type and location of fire hydrants shall meet the approval of the RCFD Fire Marshal. Water source shall have the capacity required to provide the minimum required fire flow with a residual pressure of 20psi in addition to maximum daily flow requirements for other consumer uses.

9.2 Access Roads/Driveways and Gates

Main ingress and egress for the Project will be two means of access onto a realigned Keller Road then easterly to Winchester Road (Highway 79), a major 4 lane highway, or westerly toward Pourroy Road. All access roads within the property shall be termed “Fire Access Roads” within this document and be publicly maintained. All fire access roads shall meet the requirements of the RCFD, and shall be all weather surface capable of supporting loads of 75,000 lbs gross vehicle weight shall have an unobstructed width of not less than 24 feet (7315 mm), exclusive of shoulders. Access to all portions of the buildings must be within 150 feet of the available fire deparment access.

Clearance of brush or vegetative growth along new and existing on and off-site roadways will comply with RCFD requirements if not otherwise addressed in this plan. All roads, sidewalks and similar public improvements shall be built to Riverside County standards and become the responsibility of the County to maintain once the Project is completed.

The Project will not be a gated community. However, any future gates to be installed shall meet RCFD Standards and shall be approved by the RCFD prior to their fabrication and installation. A Knox override key switch, or similar device, must be installed outside the gate in an approved, readily visible, and unobstructed location at or near the gate to provide emergency access.

10.0 HOMEOWNER EDUCATION AND REQUIREMENTS

Property Sale and Transfer
A copy of this report shall be available in the Keller Crossing Sales Office for review by any potential homebuyer. The Sales Office shall provide a copy of this Fire protection plan to each buyer at the close of escrow of the initial sale. In all subsequent sales of the property, the new property owner(s) shall be provided with a copy of the FFPP by the escrow company to insure continued compliance with all Fuel Modification maintenance and construction requirements.

Maintenance Responsibilities
Each homeowner shall be aware of the herein described fire protection measures, the types of noncombustible construction, and the plant materials that are allowed within their lot's boundaries. Of particular importance are APPENDICES 'A' and 'D' of this plan which provides guidance in the types of plants that are allowed to be established in landscaped areas and appropriate construction within Fuel Modification Zones. Plant selection is critical as embers often travel over a mile during Santa Ana wind events. In addition, firewood and similar combustible materials shall not be stored within 30-feet of any structure.

Should a Wildfire Occur
Each homeowner in the Project should ensure that all fireplace dampers, doors and windows (including the garage) are closed to prevent embers from entering their structure in the event of a wildland fire. Doors should be left unlocked to allow emergency personnel unimpeded access. Both inside and outside lights should be placed on to allow emergency personnel to know that a home is present when smoke or darkness may otherwise obscure visibility. In addition, no combustible materials shall be located within 30-feet of any structure. Move combustible materials such as outdoor furniture indoors or if there is a pool, they may be placed in the pool to prevent their ignition. Additional information concerning relocation/evacuation and preparation for wildfire can be acquired from the RCFD. See Appendix 'G' for additional homeowner information.

Do not turn off the water system at any time. Water is needed to operate the fire sprinkler system within each structure.

Evacuation
Residents should always follow evacuation orders issued by law enforcement as they will be aware of the most effective and safest route. Law enforcement will patrol evacuated areas or establish a perimeter to keep the public out as well as to prevent locals from re-entering an area during emergency operations. Only when its safe to do so will evacuated individuals be allowed to return to their homes. Communication between law enforcement and fire control agencies is constant during a wildfire event and designed to address both current and future evacuation needs.

Ready, Set, Go (RSG*)* is the evacuation strategy proposed for this Project as described on the Cal Fire website. Since its start in March 2011 by the International Association of Fire Chiefs, the RSG program has spread nationwide. Should a wildfire exist that threatens the property or safety of people at the site, the following actions shall be implemented:

1. Ready – Preparing for the Fire Threat: *Take personal responsibility and prepare long before the threat of a wildfire so the home is ready in case of a fire. Maintain a defensible space by clearing brush away from all structures. Use fire-resistant landscaping and harden structures with fire-safe construction measures. Assemble emergency supplies and belongings in a safe spot. Make sure all individuals within the area are 'on the same page' in commitment to advance preparation. Plan escape routes.*

2. Set – Situational Awareness When a Fire Starts: *Pack vehicle(s) with emergency items. Stay aware of the latest news from local media and the local fire department for updated information on the fire and perform the following:*

- ✓ *Close all windows and doors that lead outside to prevent sparks from entering the house.*
- ✓ *Close all doors within the house in case the house does catch on fire; this will slow down the spread of the fire from room to room.*
- ✓ *Move all combustible materials in the home away from windows to prevent the possibility of heat from a fire radiating through windows and glass doors and catching flammable materials inside the home on fire. This includes drapes, curtains and furniture.*
- ✓ *Close windows and all Venetian blinds or noncombustible window coverings.*
- ✓ *Turn on the lights in each room, porch, and yard. This aids in visibility when the smoke gets thick and darkens the sky.*
- ✓ *Fill all sinks, bathtubs and buckets with water in case the power goes out.*
- ✓ *Shut off any gas valves within the house or outside.*
- ✓ *Open the damper on fireplaces to stabilize inside/outside pressure, but close fireplace screens to keep sparks from igniting the house.*

3. Go – Leave early! *Following an Action Plan makes one prepared and firefighters are now able to best maneuver the wildfire and ensuring everyone's safety. Follow instructions given by the Fire Department official on site.*

11.0 MANDATED INCLUSIONS IN THE CC&R'S AND HOA REQUIREMENTS

The HOA Covenants, Conditions & Restrictions (CC&R's) shall be recorded on each parcel and include the following statements:

1) The Keller Crossing HOA shall be responsible for all required fuel treatment and fire protection measures mentioned in the Fire Protection Plan and shall have authority for enforcing required fuel treatment measures around all structures and restrictions on placing combustible structures within the fuel treatment zones.

2) Homeowners shall be responsible for all required fuel treatment and fire protection measures on their respective lots.

3) Each lot owner shall annually financially contribute their fair share of HOA required fuel treatment costs.

4) The Riverside County Fire Department will hold the HOA of the Tract 38163 accountable for enforcement of all wildland fire protection issues discussed in this p lan.

5) The Keller Crossing HOA shall have the authority to enforce a ban on trash dumping or disposal of green waste in the fuel treatment zones or open space areas.

6) All landscaping plans, including additional structures, must be approved by the HOA.

7) The HOA is responsible to the Riverside County Fire Department for the completion of all required fuel treatments in the common areas. Required on-going maintenance will be accomplished on an as needed basis. Should maintenance not be performed in a manner consistent with the Fire Protection Plan, the Riverside County Fire Department shall have the right to abate any treatment zone they deem a threat to the Tract 38163 development or adjoining properties. In doing so, all costs incurred will be billed to the owner(s). At the discretion of the Riverside County Fire Department Fire Marshal, yearly inspection of treatment areas may be required.

8) The irrigation system for all Fuel Modification Zones shall always be kept in good condition and proper working order. The irrigation system shall not be turned off except for necessary repairs, maintenance or during extended rainfall.

9) Any disputes related to individual lot landscaping or fuel treatment, with respect to interpretation of the Fuel Modification Plan Map shall be decided by the Riverside County Fire Department or its designated representative and whose decision shall be final and binding on the lot owner.

10) The Keller Crossing HOA shall provide a copy of the Fire Protection Plan to all homebuyers as part of escrow papers at the time of future resales.

12.0 FUEL MODIFICATION PLAN

Attached to this PFPP or as a separate file is the Keller Crossing Fuel Modification Plan depicting the location of all proposed fuel treatments, as well as fire access roads, lot lines, additional construction features and development boundaries.

APPENDIX 'A'

Prohibited (& Fire Prone) Plant Species List
For Fuel Modification Zones in High & Very High Hazard Areas

The following species are highly flammable and are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio.

Botanical Name	Common Name	Plant Form
Acacia species	Acacia	Shrub/Tree
Adenostema fasciculatum	Chamise	Shrub
Adenostema sparsifolium	Red Shank	Shrub/Tree
Artemisia californica	California Sagebrush	Shrub
Anthemis cotula	Mayweed	Weed
Arundo donax	Giant reed	Grass/weed
Bambusa species	Bamboo	Shrub
Brassica nigra	Black Mustard	Weed
Brassica ropa	Yellow Mustard	Weed
Cedrus species	Cedar	Tree
Cirsim vugare	Wild Artichoke	Weed
Conyza canadensis	Horseweed	Weed
Cortaderia selloana	Pampas Grass	Tall Grass
Cupressus species	Cypress	Tree
Cytisus species	Broom	Shrub
Eriogonum fasciculatum	Common Buckwheat	Shrub
Eucalyptus species	Eucalyptus	Shrub/Tree
Gensita species	Broom	Shrub
Heterotheca grandiflora	Telegraph plant	Weed/shrub
Juniperus species	Junipers	Shrub
Lactuca serriola	Prickly lettuce	Weed
Nicotiana bigelevil	Indian tobacco	Shrub
Nicotiana glauca	Tree tobacco	Shrub
Palmae species	Palms	Tree
Pennisetum species	Fountain Grass	Ground cover
Picea species	Spruce	Tree
Pinus species	Pines	Tree
Rosmarinus species	Rosemary	Shrub
Retama monosperma	Broom	Shrub
Salvia species *	Sage	Shrub
Silybum marianum	Milk thistle	Weed
Spartium junceum	Spanish Broom	Shrub
Urtica urens	Burning nettle	Weed
Washingtonia species	Palms	Tree
* Except -Salvia columbariae (chia), Salvia sonomensis (Creeping Sage)		

APPENDIX 'B'

Literature References

1. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model,* General Technical Report RMRS-GTR-153. June 2005. Joe H. Scott, Robert E. Burgan, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.

2. *BehavePlus: Fire Modeling System, version 5.0: Variables.* General Technical Report RMRS-GTR213WWW Revised. September 2009. Patricia L. Andrews, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.

3. *Behave Plus Fire Modeling System, Version 5.0.4,* General Technical Report RMRS-GRT-106WWW Revised. July 2008. Patricia L. Andrews, Collin D. Bevins, Robert Seli. United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.

4. Behave Plus Fire Model System, Version 6.0.0, Windows based computer software. USDA Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory, Missoula, MT. https://www.frames.gov/behave/home.

5. Butler KM and Johnsson EL, Maranghides A, Nazare S, Fernandez M, Zarzecki M, Tang W, Auth E, McIntyre R, Pryor M, Saar W, and McLaughlin C (2022) Wind-Driven Fire Spread to a Structure from Fences and Mulch. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Technical Note (TN) NIST TN 2228. https://doi.org/10.6028/NIST.TN.2228-upd1.

6. California Code of Regulations Title 14 section 1280 and Title 24 Part 9

7. California Public Resources Code Sections 4201 through 4204

8. California Government Code, sections 51175 through 51189

9. 2025 California Fire Code, including appendices to Chapters 1 & 4 and Appendices B, F & H and Local Amendments

10. 2025 California Residential Code (CRC) Section R337

11. *The California State and Local Responsibility Area Fire Hazard Severity Zone Map – Fire and Resource Assessment Program of CAL FIRE.*

12. The California Wildland-Urban Interface Code, 2025

13. County of Riverside Ordinance No. 787 (as amended through 787.11) Adopted December 13, 2022. *An Ordinance of the County of Riverside Adopting the 2022 California Fire Code as Amended.*

14. Dong et al., 2007, Z. Dong, W. Luo, G. Qian, H. Wang. **A wind tunnel simulation of the mean velocity fields behind upright porous fences.** Agric. For. Meteorology., 146 (1-2) (2007), pp. 82-93.

15. National Fire Protection Association - NFPA 13 Standard for the Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes, 13-R &13-D, 2025 Edition

16. National Fire Protection Association – NFPA 1140 Standard for Wildland Fire Protection. 2022 Edition.

17. Quarles, S., and E. Smith. 2011. The Combustibility of Landscape Mulches, SP-11-04, University of Nevada Cooperative Extension, Reno, NV.

18. Riverside County Fire Department – Fire Department Access Requirements for Commercial & Residential Development. Guideline OFM-01A. 01/30/2024.

19. Riverside County Fire Department – Fire Department Water Supply and Fire Hydrant Requirements for Commercial and Residential Development. Guidelines OFM-01B. January, 2024.

20. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model,* General Technical Report RMRS-GTR-153. June 2005. Joe H. Scott, Robert E. Burgan, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.

21. Western Region Climate Center. *Historic Climate Data from Remote Automated Weather Stations.* RAWS USA Climate Archive. Reno, NV. Data for all Remote Automated Weather Stations is available at: http://www.raws.dri.edu/index.html

APPENDIX 'C'

Ignition Resistant Construction Requirements

The following is a summary of the current requirements for ignition resistant construction for high-fire hazard areas as of the date of this fire protection plan. All structures must follow the requirements found in the Wildland Urban Interface Code and the California Building Code and where applicable, the current California Residential Code, Section R337. However, the requirements listed below are not all inclusive and all exterior building construction including roofs, eaves, exterior walls, doors, windows, decks, and other attachments must meet the current Wildland Urban Interface Code for ignition resistance requirements, and any additional County codes in effect at the time of building permit application. See the current applicable codes for a detailed description of these requirements and any exceptions.

1. All structures will be built with a Class A Roof Assembly and shall comply with the requirements of the California Wildland Urban Interface Code. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.

2. Roof valley flashings shall be not less than 0.019-inch (0.48 mm) No. 26 gage galvanized sheet corrosion-resistant metal installed over not less than one layer of minimum 72-pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909, at least 36-inch-wide (914 mm) running the full length of the valley.

3. Attic or foundation ventilation louvers or ventilation openings in vertical walls shall be covered with a minimum of 1/16-inch and shall not exceed 1/8-inch mesh corrosion-resistant metal screening or other approved material that offers equivalent protection.

4. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to resist the intrusion of flames and embers, be fire stopped with approved materials or have one layer of a minimum 72-pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking.

5. Enclosed roof eaves and roof eave soffits with a horizontal underside, sloping rafter tails with an exterior covering applied to the under-side of the rafter tails, shall be protected by one of the following:
   - noncombustible material
   - Ignition-resistant material
   - One layer of $^{5}/_{8}$-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit
   - The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

- Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in Section 707A.10 when tested in accordance with the test procedures set forth in ASTM E2957.
- Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

Exceptions: The following materials do not require protection:
1. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails.
2. Fascia and other architectural trim boards.

6. The exposed roof deck on the underside of unenclosed roof eaves shall consist of one of the following:
   - Noncombustible material, or
   - Ignition-resistant material, or
   - One layer of 5/8-inch Type X gypsum sheathing applied behind an exterior covering on the underside exterior of the roof deck, or
   - The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the roof deck designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association fire Resistance Design Manual.

   Exceptions: The following materials do not require protection:
   1. Solid wood rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm).
   2. Solid wood blocking installed between rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm).
   3. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails. 4. Fascia and other architectural trim boards.

7. Vents - ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet one of the following requirements:
   A. Vents listed to ASTM E2886 and complying with all the following:
      i. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
      ii. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
      iii. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).
   B. Vents shall comply with all the following:
      i. The dimensions of the openings therein shall be a minimum of $^{1}/_{16}$-inch (1.6 mm) and shall not exceed $^{1}/_{8}$-inch (3.2 mm).

ii. The materials used shall be noncombustible.
Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible wire mesh, may be of combustible materials.
iii. The materials used shall be corrosion resistant.

8. Vents shall not be installed on the underside of eaves and cornices.

Exceptions:

1. Vents listed to ASTM E2886 and complying with all 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°F (350°C).
2. The enforcing agency shall be permitted to accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.
3. Vents complying with the requirements of Section 706A.2 shall be permitted to be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

   3.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,
   3.2. The exterior wall covering, and exposed underside of the eave are of noncombustible materials, or ignition-resistant materials, as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material and the requirements

9. All chimney, flue or stovepipe openings that will burn solid wood will have an approved spark arrester. An approved spark arrester is defined as a device constructed of nonflammable materials, having a heat and corrosion resistance equivalent to 12-gauge wire, 19-game galvanized steel or 24-gage stainless steel. or other material found satisfactory by the Fire Protection District, having ½-inch perforations for arresting burning carbon or sparks nor block spheres having a diameter less than 3/8 inch (9.55 mm). It shall be installed to be visible for the purposes of inspection and maintenance and removeable to allow for cleaning of the chimney flue.

10. All multi-family structures will have automatic interior fire sprinklers installed according to the National Fire Protection Association (NFPA) 13R - *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*.

11. All single-family structures will have automatic interior fire sprinklers installed according to the National Fire Protection Association (NFPA) 13D – *Standard for the Installation of Sprinkler System in One- and Two-Family Dwellings and Manufactured Homes*.

12. The exterior wall covering, or wall assembly shall comply with one of the following requirements:
    - Noncombustible material, or
    - Ignition resistant material, or
    - Heavy timber exterior wall assembly, or
    - Log wall construction assembly, or
    - Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact expose test set forth in ASTM E2707 with the conditions of acceptance shown in Section 707A.3.1 of the California Building Code, or
    - Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1.

    Exception: Any of the following shall be deemed to meet the assembly performance criteria and intent of this section including;
    - One layer of 5/8-inch Type X gypsum sheathing applied behind the exterior covering or cladding on the exterior side of the framing, or
    - The exterior portion of a 1-hour fire resistive exterior wall assembly designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Associate Fire Resistance Design Manual.

13. Exterior walls shall extend from the top of the foundation to the roof and terminate at 2-inch nominal solid blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

14. Gutters shall be provided with the means to prevent the accumulation of leaf litter and debris within the gutter that contribute to roof edge ignition.

15. All rain gutters, down spouts and gutter hardware shall be constructed from metal or other noncombustible material to prevent wildfire ignition along eave assemblies.

16. No attic ventilation openings or ventilation louvers shall be permitted in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas.

17. All projections (exterior balconies, decks, patio covers, unenclosed roofs and floors, and similar architectural appendages and projections) or structures less than five feet from a building shall be of non-combustible material, one-hour fire resistive construction on the underside, heavy timber construction or pressure-treated exterior fire-retardant wood. When such appendages and projections are attached to exterior fire-resistive walls, they shall be constructed to maintain same fire-resistant standards as the exterior walls of the structure.

18. Deck Surfaces shall be constructed with one of the following materials:
    - Material that complies with the performance requirements of Section 709A.4 when tested in accordance with both ASTM E2632 and ASTM E2726, or

- Ignition-resistant material that complies with the performance requirements of 704A.3 when tested in accordance with ASTM E84 or UL 723, or
- Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5, or
- Exterior fire-retardant treated wood, or
- Noncombustible material, or
- Any material that complies with the performance requirements of SFM Standard 12-7A-4A when the attached exterior wall covering is also composed of noncombustible or ignition resistant material.

19. Accessory structures attached to buildings with habitable spaces and projections shall be in accordance with the Building Code. When the attached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have all underfloor areas and exterior wall construction in accordance with the California Wildland-Urban Interface Code.

20. Exterior windows, skylights and exterior glazed door assemblies shall comply with one of the following requirements:
    - Be constructed of multiplane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing, or
    - Be constructed of glass block units, or
    - Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
    - Be tested to meet the performance requirements of SFM Standard 12-7A-2.

21. All eaves, fascia and soffits will be enclosed (boxed) with non-combustible materials. This shall apply to the entire perimeter of each structure. Eaves of heavy timber construction are not required to be enclosed as long as attic venting is not installed in the eaves. For the purposes of this section, heavy timber construction shall consist of a minimum of 4x6 rafter ties and 2x decking.

22. Detached accessory buildings that are less than 120 square feet in floor area and are located more than 30 feet but less than 50 feet from an applicable building shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section 704A.2 of the California Building Code.

    Exception: Accessory structures less than 120 square feet in floor area located at least 30 feet from a building containing a habitable space.

23. All side yard fence and gate assemblies (fences, gate, and gate posts) when attached to the home shall be of non-combustible material. The first five feet of fences and other items attached to a structure shall be of non-combustible material.

24. Exterior garage doors shall resist the intrusion of embers from entering by preventing gaps between doors and door openings, at the bottom, sides, and tops of doors, from exceeding

1/8 inch. Gaps between doors and door openings shall be controlled by one of the methods listed in this section.

- Weather-stripping products made of materials that:
  (a) have been tested for tensile strength in accordance with ASTM D638 (Standard Test
  Method for Tensile Properties of Plastics) after exposure to ASTM G155 (Standard
  Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials) for a period of 2,000 hours, where the maximum allowable difference in tensile strength values between exposed and non-exposed samples does not exceed 10%; and
  (b) exhibit a V-2 or better flammability rating when tested to UL 94, Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
    - Door overlaps onto jambs and headers.
    - Garage door jambs and headers covered with metal flashing.

25. Exterior doors shall comply with one of the following:
    1) The exterior surface or cladding shall be of noncombustible material or,
    2) The exterior surface or cladding shall be of ignition-resistant material or,

    3) The exterior door shall be constructed of solid core wood that complies with the following requirements:
       3.1. Stiles and rails shall not be less than 1-3/8 inches thick.
       3.2. Panels shall not be less than 1-1/4 inches thick, except for the exterior perimeter of the panel that shall be permitted to taper to a tongue not less than 3/8 inch thick.
    4) The exterior door assembly shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252 or,
    5) The exterior surface or cladding shall be tested to meet the performance requirements of Section 707A.3.1 when tested in accordance with ASTM E2707 or,
    6) The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

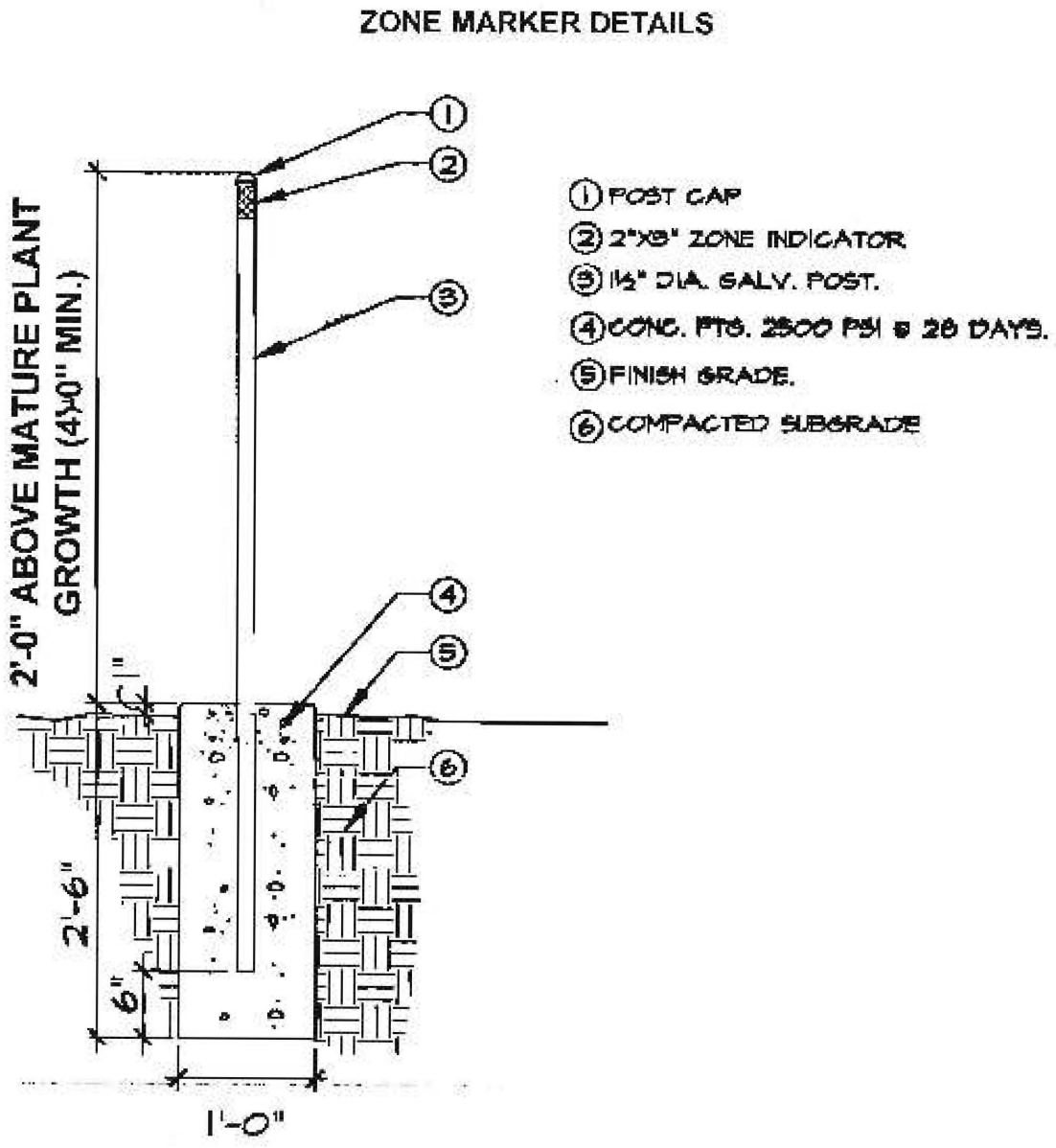
26. Fire access tunnels shall have two hour rated walls consisting of two layers of 5/8" Type 'X' gypsum wallboard panels on each side of the studs. The EZ Taping Systems "Fire Tape" product or equivalent should be used as an alternative to convention joint tape when:
    1. Two or more layers of listed Type 'X' gypsum wallboard are applied vertically with joints staggered and joints of the face board are":
       a. Tightly butted and taped with EZ Taping Systems "Fire Tape" or equivalent product or
       b. Finished with joint compound of EZ Taping Systems "Fire Tape" or equivalent product if the gap between gypsum wallboard panels are visible at the joint.
    2. Two or more layers of USG "Sheetrock" Fire code C gypsum wallboard are applied (horizontally or vertically).

3. Gypsum panels shall be attached with Type S drywall screws, placed 8” oc to vertical edges and 12” oc to top and bottom runners and intermediate studs.
4. Fire Tape shall be nominal 2” wide and applied on the vertical joints at studs.

** FAHJ – Fire Authority Having Jurisdiction
SFM – State Fire Marshal
NFPA – National Fire Protection Association

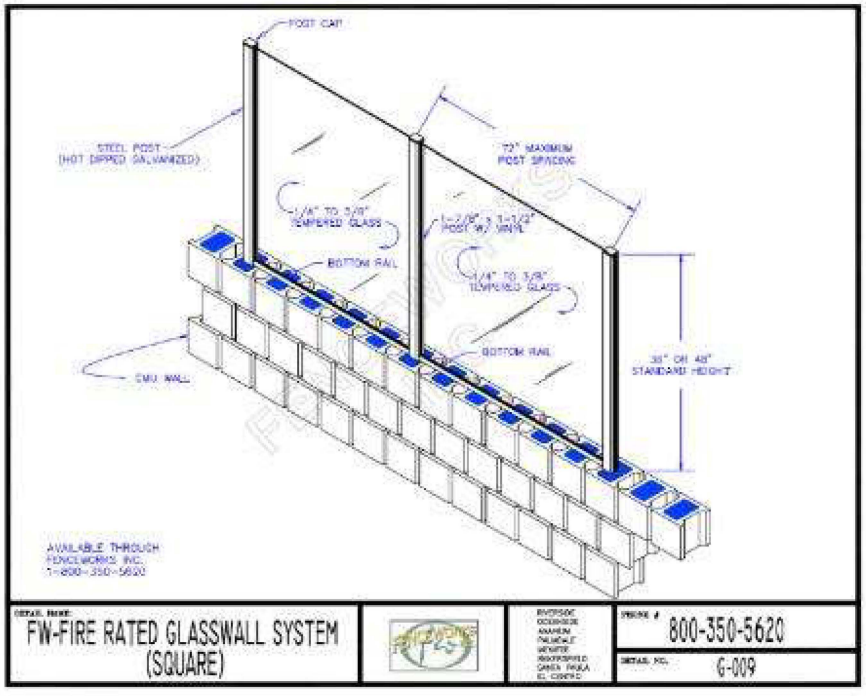
APPENDIX 'D'

ZONE MARKER DETAIL



APPENDIX ‘E’

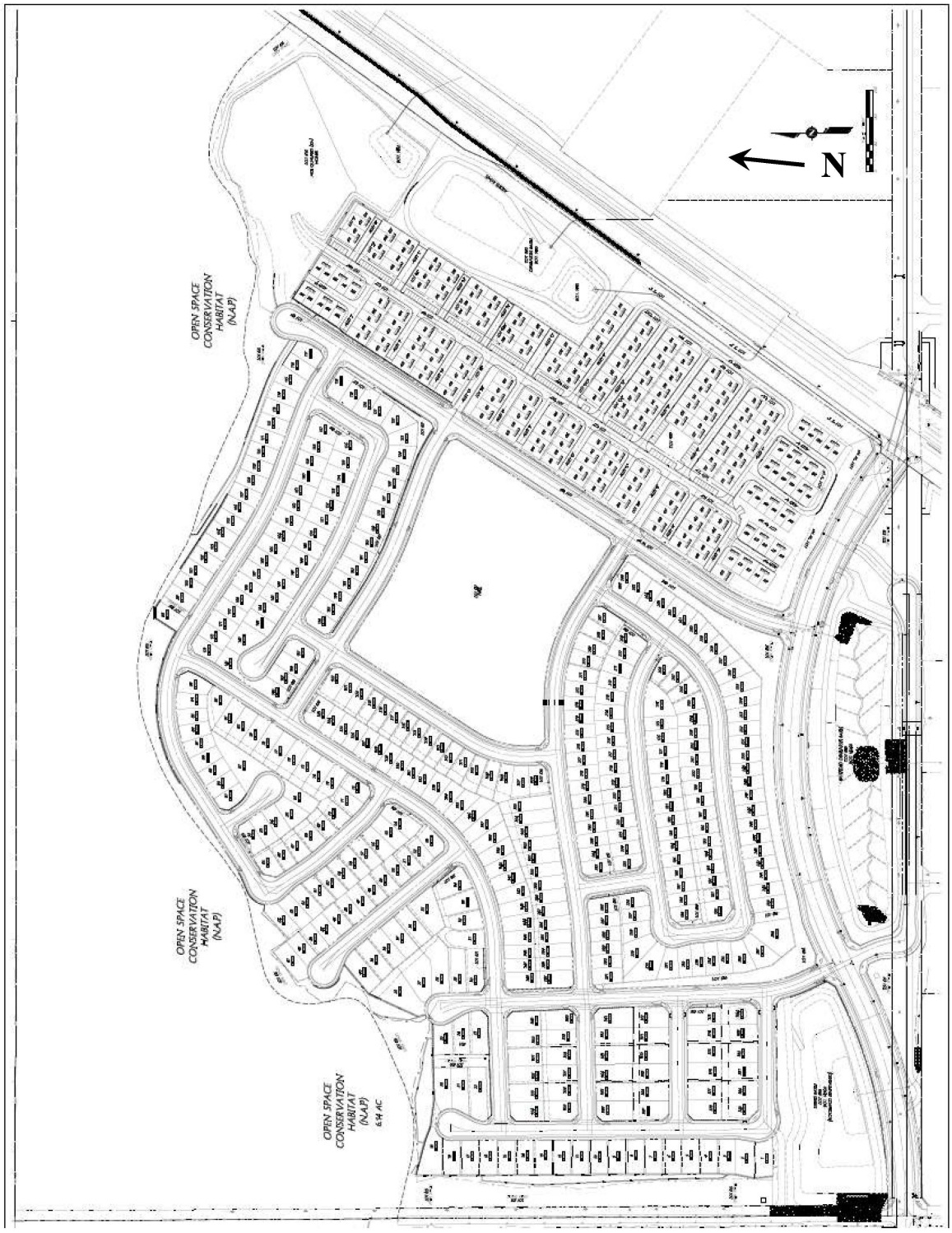
EXAMPLE OF A VIEW WALL





Note: There are many fence builders that can building fire deflection view walls. ***FIRE*WISE2000 LLC** does not endorse any business. The designs shown above are consistant with this plan.

APPENDIX 'F'
Site Plan



Site Plan – For general visualization purposes. Note that a portion of the tract will be duplex units.

APPENDIX 'G'

Additional Homeowner/HOA Information

The following additional information is designed to help the homeowner and HOA protect their homes and community.

Maintenance Equipment
When performing landscape maintenance such as mowing or using a chainsaw, be especially careful as a spark can start a fire. The use of battery-operated equipment is less likely to cause a problem. Modern battery technology includes a heat sensor inside the electric motor and when it gets hot it flips a switch killing the motor until it has had a chance to cool down. This feature lessens the likelihood of a fire. Metal mowing equipment should be avoided as a rapidly rotating metal blade could strike a rock creating a spark which could on very dry days start a fire. String trimmers are preferred to metal as they are much less likely to start a fire.

When mowing, choose the cooler morning hours before 10 am and avoid dry and windy conditions. Gasoline powered equipment such as tractors, chainsaws, weed eaters, and mowers are required to have a spark arrester. Do not overfill fuel tanks. Gasoline expands by volume approximately 1 percent for every 15-degree temperature change. Should fuel be spilled, wipe away any excess and allow the fumes to dissipate before restarting the engine. Mowing equipment exhaust systems can reach temperatures of over 1,000 degrees during their operation. Do not set or park equipment in dry vegetation.

The HOA shall yearly provide lot owners with information regarding the landscape maintenance on each lot and the wildfire risk and hazard mitigation efforts that are necessary for community fire safety that are contained within this Plan.

Electricity Required
Southern California Edison (SCE) will provide the Project electricity. To reduce the risk of a fire starting, SCE may elect to implement what is known as a Public Safety Power Shutoff (PSPS). This may occur when there are high winds or a forecast for them and very high or extreme wildland fire danger. Homeowners can sign up for a free PSPS alerts at https://www.scepsps.com/. SCE also provides forecast information concerning potential PSPS shutdowns for the next seven days on their website at https://www.sce.com/wildfire/weather-awareness.

Electricity is required to operate garage doors and the landscape irrigation system. Should a PSPS notification be issued, it is highly recommended that the vehicle that would be used to evacuate be taken out of the garage and parked in the driveway prior to electricity being shut down.

During a prolonged electric outage, the irrigation system may have to be operated manually to maintain high moisture levels.

Electricity is required to operate garage doors and the landscape irrigation system. Should a PSPS notification be issued, it is highly recommended that the vehicle that would be used to evacuate

be taken out of the garage and parked in the driveway prior to electricity being shut down. To aid in evacuation, the vehicle should face the roadway. During a prolonged electric outage, the landscape irrigation system may have to be operated manually to maintain high moisture levels in all landscape plants.

Health and Safety

Homeowners should be aware that smoke is harmful to your health, especially if a person has asthma or chronic obstructive pulmonary disease, including bronchitis and emphysema. People with pre-existing health conditions related to the heart or circulatory systems may want to reclocate to a safe area before official notification to relocate to avoid smoke impacts. It is recommended that people leave the area affected by wildfire smoke if indoor air cannot be kept clean.

Pets can also be effected by exposure to smoke. High levels of smoke may irritate the animals' eyes and respiratory tract. Animals with heart or lung disease are especially at-risk and should be closely watched during periods of poor air quality.

Homeowners and the HOA can monitor local air quality by visiting the following web site: https://www.iqair.com/us/usa/california/vacaville. It also contains a forecast for the next two days. Remember, windblown smoke can travel for miles from its source. The farther a person is away from the source, the less the smoke impact will be.

Vehicle Storage

Automobiles as well as recreation vehicles are not designed for wildfire exposure, especially embers resulting from either burning vegetation or structures. While there is limited data on fire loss in recreational vehicles due to embers in the United States, there is signficant information concerning automobile losses in wildfire events. In the 2023 Maui wildfire, officials estimate that over 1,000 vehicles were abandoned in public right-of-ways while they believe that the total number of vehicles lost was about 4,000. To put that into perspective, the Maui fire burned 2,207 structures.

The British Columbia Wildfire Service following the devestating 2023 fire season conducted a review. The preliminary findings show that embers ignited shrubs around homes such as junipers and cedars or ignited parked vehicles, RVs, boats, hot tubs, outbuildings, and ATVs. Those in turn ignited other buildings and led to fire spreading to homes.

To reduce the likely of a automobile or recreation vehicle fire spreading to the nearby home, it is recommended that stored vehicles be parked 30 feet or more from a structure. To reduce the likely of a vehicle catching fire during a wildfire, do not park vehicles on combustible material such as dead grass or other vegetation.

Landscape Irrigation Need Assessment Methods

There are several easy methods of determing if your landscape plants need additional irrigation. One is through observation of wilting or of leaves becoming thinner due to dehydration. Another is to stick your index finger into the soil near a plant to the second joint. If your finger comes out dry, the soil is likely too dry and needs additional irrigation. If it comes out wet and dirty, there is sufficient irrigation.

Infrared (IR) thermometers guns are useful tools for measuring the surface temperature of plants and are often used in the monitoring of crops. USDA research has discovered a correleation between plant stress levels and a rise in leaf temperature. When the leave surface temperature exceeds that of ambient air temperature, the plant is under stress. IR guns are inexpensive handheld devices that are a fast and accurate means of testing the surface temperatures of any surface including plant leaves. Be aware that the angle of the measurement is critical should the instrament have a wide field of view, it could be detecting heat from not only the intended leaf surface but other objects within its field of view. For small leaves, most IR guns should be taken from 14-18 inches from the leaf surface. Be aware that reading can vary due to instantaneous horizontal wind speed. Also differences in the same vegetation type can occur in shaded vs full sun conditions.

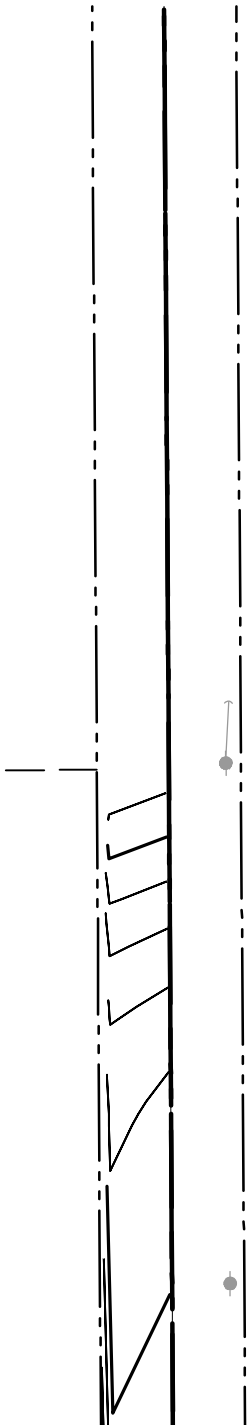
APPENDIX ‘H’

Landscape Plan

To be added with the Final Fire Protection Plan

APPENDIX ‘I’

Fire Behavior Worksheets



LOT 615

