APPENDIX 13

FIRE PROTECTION PLAN
Whitewood Condo / Apartment Project
City of Murietta

Prepared for:

Corman Leigh
32823 Temecula Parkway
Temecula, California 92866
Contact: Jordan Bursch, Director of Acquisitions

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024
Contact: Michael Huff, Project Manager

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Executive Summary

This Fire Protection Plan (FPP) has been prepared for Whitewood Condo/Apartment Project (Proposed Project) located in the City of Murietta, California. This FPP evaluates and identifies the potential fire risk associated with the Proposed Project's land uses and identifies requirements for water supply, fuel modification and defensible space, access, building ignition and fire resistance, and fire protection systems, among other pertinent fire protection criteria. The purpose of this plan is to generate and memorialize the fire safety requirements and standards of the Murietta Fire and Rescue (MFR) along with project-specific measures based on the site, its intended use, and its fire environment.

This document provides analysis of the site's fire environment and its potential impact on the Proposed Project as well as the project's potential impact on the existing fire protection service. The fire safety measures included herein are based on site-specific fire environment analysis and Proposed Project characteristics and incorporates area fire planning documents, site risk analysis, and standard principles of fire protection planning.

As determined during the analysis of this site and its fire environment, the Project site, in its current condition, may include characteristics that, under favorable weather conditions, could have the potential to facilitate fire spread. Under extreme conditions, seasonal wind-driven wildfires could cast embers onto the property. Once the Project is built, the on-site fire potential will be much lower than its current condition due to conversion of wildland fuels to building footprints, parking areas, managed landscapes, fuel modification areas, improved accessibility for fire personnel, and structures built to the latest ignition and ember resistant fire codes.

It is important to note that the fire safety measures that will be implemented on this site, including ignition resistant construction standards, water supply, fire apparatus access, fuel modification and defensible space, interior fire sprinklers and fire response travel times were integrated into the model code requirements and local AHJ guidelines based on results of post-fire assessments, similar to the After Action Reports that are now prepared after large fire events. When it became clear that specifics of how structures were built, how fire and embers contributed to ignition of structures, what effects fuel modification had on structure ignition, how fast firefighters could respond, and how much (and how reliable) water was available, were critically important to structure survivability, the Fire and Building codes were revised appropriately.

The proposed development of this property includes construction of 483 dwelling units within 38 structures on roughly 29 gross-acres. The entire site has been designed with fire protection as a key objective. The site improvements are designed to facilitate emergency apparatus and personnel access throughout the site. Driveway and road improvements with turnarounds provide access throughout the Project. Water availability and flow will be consistent with local and state code requirements for fire flow and hydrant distribution. These features along with the ignition resistance of all buildings, the interior fire sprinklers, and the pre-planning, training and awareness will assist responding firefighters through prevention, protection and suppression capabilities.

As detailed in this FPP, the project's fire protection systems will include a redundant layering of protection methods that have proven to reduce overall fire risk. The fire safety measures included herein are performance based and site–specific, considering the Project's unique characteristics rather than a prescriptive, one-size-fits-all approach. The fire protection systems are designed to increase occupant and building safety, reduce the fire risk on site, to minimize risks associated with typical uses, and aid the responding firefighters during an emergency. No singular measure is intended to be relied upon for the site's fire protection, but rather, a system of fire protection measures, methods, and features combine to result in enhanced fire safety, reduced fire potential, and improved safety in the development.

Early evacuation for any type of wildfire emergency at Whitewood Condo/Apartment Project is the preferred method of providing for occupant and business safety, consistent with the Owner's and MFR current approach for evacuation. As such, Whitewood Condo/Apartment Project's Owner and Property Management Company will formally adopt, practice, and implement this approach to site evacuation (see RivCoReady.org for information).

Based on the results of this FPP's analysis and findings, the following FPP implementation measures will be provided as part of the proposed development plan. Based on the analysis conducted herein, the Project meets all fire and building code requirements and includes appropriate protections for the fire environment in which it is located. These measures are discussed in more detail throughout this FPP.

Implementation Measures

1. Project buildings will be constructed of ignition resistant[1] construction materials and include automatic fire sprinkler systems based on the latest adopted Building and Fire Codes for occupancy types.
2. Fuel Modification will be provided around the perimeter of the site, as required by MFR and will be 100 feet wide. On-going maintenance will managed by Owner's, Property Management Company, or another approved entity, at least annually or as needed.
3. Paved roads are provided around the perimeter of the project, either on site or existing off site.
4. Landscape plantings will not utilize prohibited plants that have been found to be highly flammable; landscape materials must be drought tolerant, fire resistive plantings.
5. FMZ Inspections. HOA will hire a 3rd party, MFR-approved, FMZ inspector and landscape plan reviewer to provide annual certification (written report submitted to MFR by May 1) that the HOA maintained properties including all FMZs and meet the requirements of this FPP.
6. Fire apparatus access roads (i.e., public and private streets) will be provided throughout the development, and will provide at least the minimum required unobstructed travel lanes, lengths, turnarounds, and clearances required by applicable codes. Primary access and internal circulation will comply with the requirements of the MFR.
7. Buildings will be equipped with automatic fire sprinkler systems meeting MFR requirements.
8. Water capacity and delivery provide for a reliable water source for operations and during emergencies requiring extended fire flow.
9. The Property Owner's or Property Management Company, will provide owners informational brochures at time of occupancy, which will include an outreach and educational role to ensure fire safety measures detailed in this FPP have been implemented and prepare development-wide evacuation plans.

[1] A type of building material that resists ignition or sustained flaming combustion sufficiently to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small flames, as prescribed in CBC, Chapter 7A and State Fire Marshal Standard 12-7A-5, Ignition-Resistant Materials.

1 Introduction

This Fire Protection Plan (FPP) has been prepared for the proposed Whitewood Condo/Apartment Project (Proposed Project) in the city of Murietta, California. The purpose of the FPP is to assess any potential impacts resulting from wildland fire hazards and verifythe proposed implementation measures adequately address those impacts. Additionally, this plan generates and memorializes the fire safety requirements of the Fire Authority Having Jurisdiction (FAHJ), which is Murietta Fire and Rescue (MFR). Fire safety measures are based on site-specific project characteristics and incorporate input from the project applicant and the FAHJ.

As part of the assessment, the plan has considered the property location, topography, surrounding combustible vegetation (fuel types), climatic conditions, and fire history. The plan addresses water supply, access, structural ignitability and fire resistive building features, fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the community and essential infrastructures. The following tasks were performed toward completion of this plan:

- Gather site specific climate, terrain, and fuel data;
- Collect site photographs;
- Process and analyze the data using the latest GIS technology;
- Predict fire behavior using scientifically based fire behavior models, comparisons with actual wildfires in similar terrain and fuels, and experienced judgment;
- Analyze and guide design of proposed infrastructure;
- Analyze the existing emergency response capabilities;
- Assess the risk associated with the Proposed Project and the project site; and
- Prepare this FPP detailing how fire risk will be mitigated through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades.

Field observations were utilized to augment existing digital site data in generating the fire behavior models and formulating the fire safety measures presented in this FPP. Refer to Appendix A for site photographs of existing site conditions.

1.1 Applicable Codes/Existing Regulations

This FPP demonstrates that Whitewood Condo/Apartment Project will comply with applicable portions of Murietta Fire Prevention Standards. The project will also be consistent with the 2019 edition of the California Building Code (CBC) and California Fire Code (CFC) as adopted and amended by MFR Municipal Code (Chapter 15.24 Fire Code). Additionally, MFR references Fire Prevention Standards for informational purposes in clarifying and interpreting provisions of the CFC, National Fire Protection Association (NFPA) and California Public Resources Code (PRC). Chapter 7A of the CBC focuses primarily on preventing ember penetration into buildings, a leading cause of structure loss from wildfires.

Thus, it is an important component of this FPP given the Project's wildland-urban interface (WUI) location is in an area statutorily designated as a Very High Fire Hazard Severity Zone (FHSZ) (Figure 4 local responsibility area (LRA)

by California Department of Forestry and Fire Protection (CAL FIRE) (FRAP 2008). The designations of Fire Hazards are based on topography, vegetation, and weather, amongst other factors with more hazardous sites, which include steep terrain, un-maintained fuels/vegetation, and WUI locations. Projects situated in VHFHSZ's require fire hazard analysis and application of fire protection measures that have been developed to specifically result in defensible communities in these WUI locations.

As described in this FPP, the Proposed Project will meet all applicable fire and building code requirements for building in these higher fire hazard areas. These codes have been developed through decades of after fire structure save and loss evaluations to determine what causes building loss during wildfires. The resulting fire codes now focus on mitigating former structural vulnerabilities through construction techniques and materials so that the buildings are resistant to ignitions from direct flames, heat, and embers, as indicated in the 2019 California Building Code (Chapter 7A, Section 701A Scope, Purpose and Application).

The Proposed Project will also be consistent with the following codes and regulations:

- **2019 California Building Code, Ch. 7A** – Materials and Construction Methods for Exterior Wildfire Exposure: minimum standards for a new building located in a WUI area to resist the intrusion of flame or burning embers projected by a vegetation fire.

- **2019 California Fire Code, Chapter 49** – Requirements for Wildland-Urban Interface Fire Areas: minimum standards to increase the ability of a building to resist the intrusion of flame or burning embers being projected by a vegetation fire.

- **2019 California Code of Regulations, Title 14, Div. 1.5, Ch. 7, Sub-Ch. 2** – SRA/VHFHSZ Fire Safe Regulations: minimum wildfire protection standards in conjunction with building, construction and development in the SRA and VHFHSZ.

- **California Public Resources Code, Div. 4, Part 2, Ch. 3, Sec. 4290**: minimum fire safety standards related to defensible space in Hazardous Fire Areas; **Sec. 4291**: Defensible space maintenance on Mountainous, Forest-, Brush- and Grass-Covered Lands.

- **California Government Code, Title 5, Div. 1, Part 1, Ch. 6.8, Sec. 51175-51189**: Very High Fire Hazard Seerity Zones.

- **California Government Code, Title 7, Div. 2, Ch. 4 Sec. 66474.02**: requirements for tentative map approval in a very high fire hazard severity zone.

1.2 Project Summary

1.2.1 Project Overview

The Whitewood Condo/Apartment Project proposes development of approximately 29 acres for a multi-family development including condominiums and apartments (Figure 2, Site Plan). The Project is broken down into two phases for various uses (Refer to Figure 3, Conceptual Master Plan). The Whitewood Condo/Apartment provides for a total of 483 dwelling units: 12 3-story apartment buildings and 21 2-story condominium buildings along with clubhouse, swimming pools, amenities, parks, landscaping, trails and parking.

The proposed circulation pattern provides for two points of access/egress, one on Whitewood Avenue and another on Clinton Keith Road. The interior circulation system includes roadways that loop the two the project phases. Internal roads provide access to the various buildings, dwelling units and parking areas from the loop roads. The accompanying infrastructure will consist of an internal road circulation system, water, sewer, and storm water drainage systems, and utilities.

1.2.2 Location

The proposed project is comprised of one parcel, approximately 29.18 acres, located along Clinton Keith Road at the southeast corner of the intersection of Whitewood Road and Clinton Keith Road in the City of Murrieta, Riverside County, California. The site is located in Section 2, Township 7 South, Range 3 West, SBM as found on the USGS – Murrieta Quadrangle, 7.5 Minute Series topographic. The Assessor Parcel Number is 900-030-036.

1.2.3 Existing Land Use

The Project site is an undeveloped rectangular parcel of land with native vegetation and several disturbed pathways throughout the site from off-road use.

The overall setting is that of a transitional area with urbanized areas to the west and moderately developed and rural area to the east. Surrounding land uses that lie adjacent to the Proposed Project site include Clinton Keith Road to the north, which is a multi-lane primary thoroughfare through the city of Murietta. Across the street to the north are sparsely developed rural residential properties. To the west is Whitewood Road, a multi-lane roadway along the northern portion of (vacant land) managed by the Center for Natural Lands Management. On the western side of Whitewood Road is the Vista Murietta High School campus. Bordering the south and east property lines of the Project are vacant lands conserved as part of the Western Riverside County Multi Species Habitat Conservation Plan (MSHCP).

1.2.4 Project Details

The proposed project will be developed as a combination of condominiums and appartments, which will make up the Whitewood Condo / Apartment Project. The site is planned to contain thirty-eight (38) buildings, of which twenty-seven (27) are condos and will be installed during one phase of construction, while the remaining eleven (11) buildings being developed during a separate phase. Ultimately, the site will contain a total of 483 dwelling units at the site.

The Project will develop 24 of the condo buildings with six units each and three buildings will contain three units each. The total condo square footage on the site will be 125,472 SF, and it will occupy 9.98-acres of the project site. The Project will develop 11 apartment buildings, each will contain 30 units and the total building square footage will be 23,884 SF. The total apartment square footage on the site will be 286,608 SF, and it will occupy 19.2-acres of the project site.

Phase I of construction (condominium site) will include two Water Quality Management Basins (WQMB) on the western border of the site towards Whitewood Road. Phase I site access will be provided along Whitewood Road including parking and pavement enabling access to the condo buildings. Phase I also includes the installation of five parks with a recreation center, barbeque area, and a pool.

Phase II of construction (apartment site) will include the installation of a WQMP Basin at the northeast corner of the site near the proposed site access along Clinton Keith Road. Phase II includes the installation of two parks, a recreation center, barbeque area, and a pool. Also included is the installation of parking and pavement enabling access to the apartment buildings, as well as connecting access to the Phase I condominium site. Additionally, the project has a trail that traverses the entire perimieter of the site.

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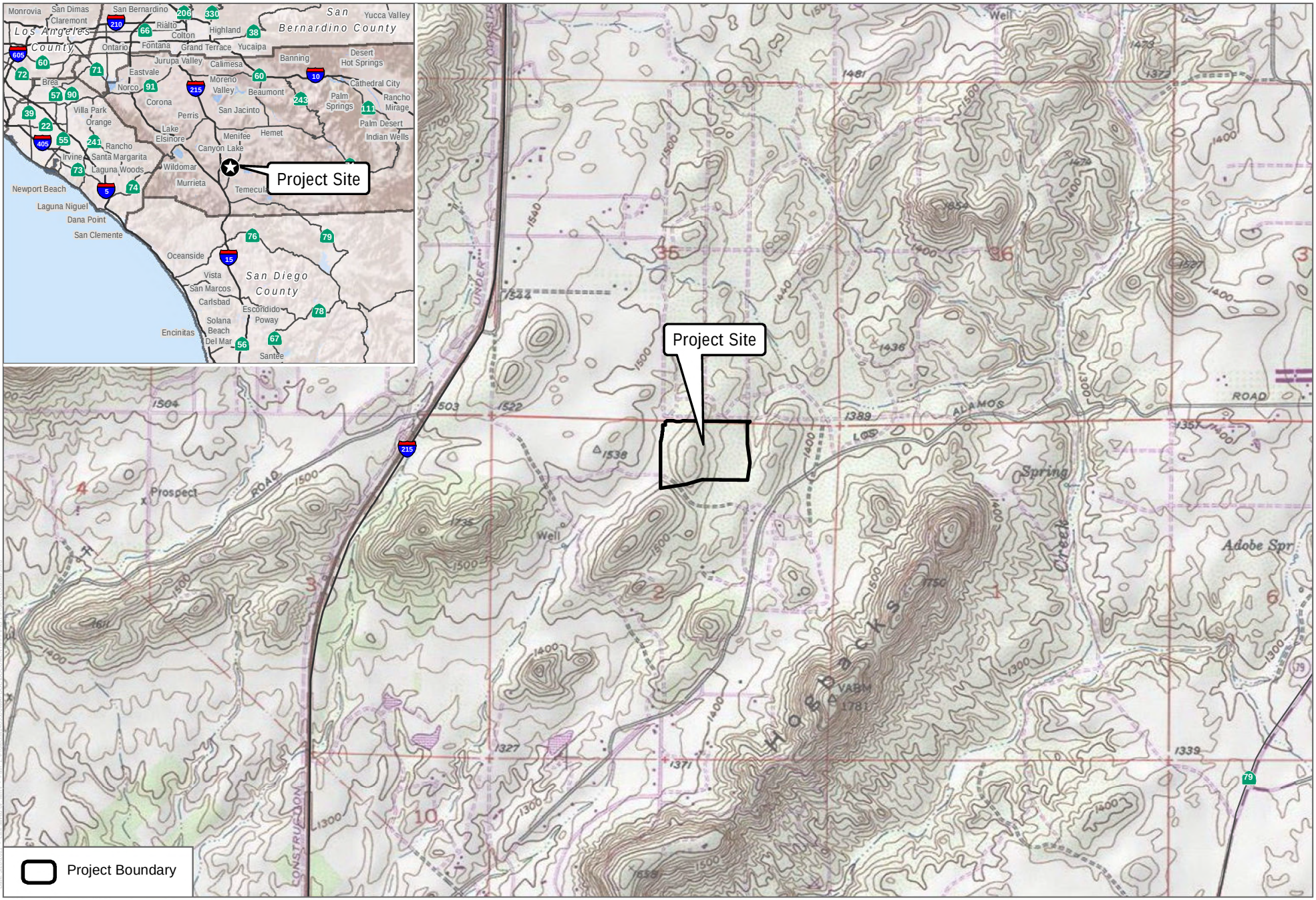

SOURCE: USGS 7.5-Minute Series Murrieta Quadrangle

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FIGURE 1

Project Location

Fire Protection Plan for the Whitewood 29 Project

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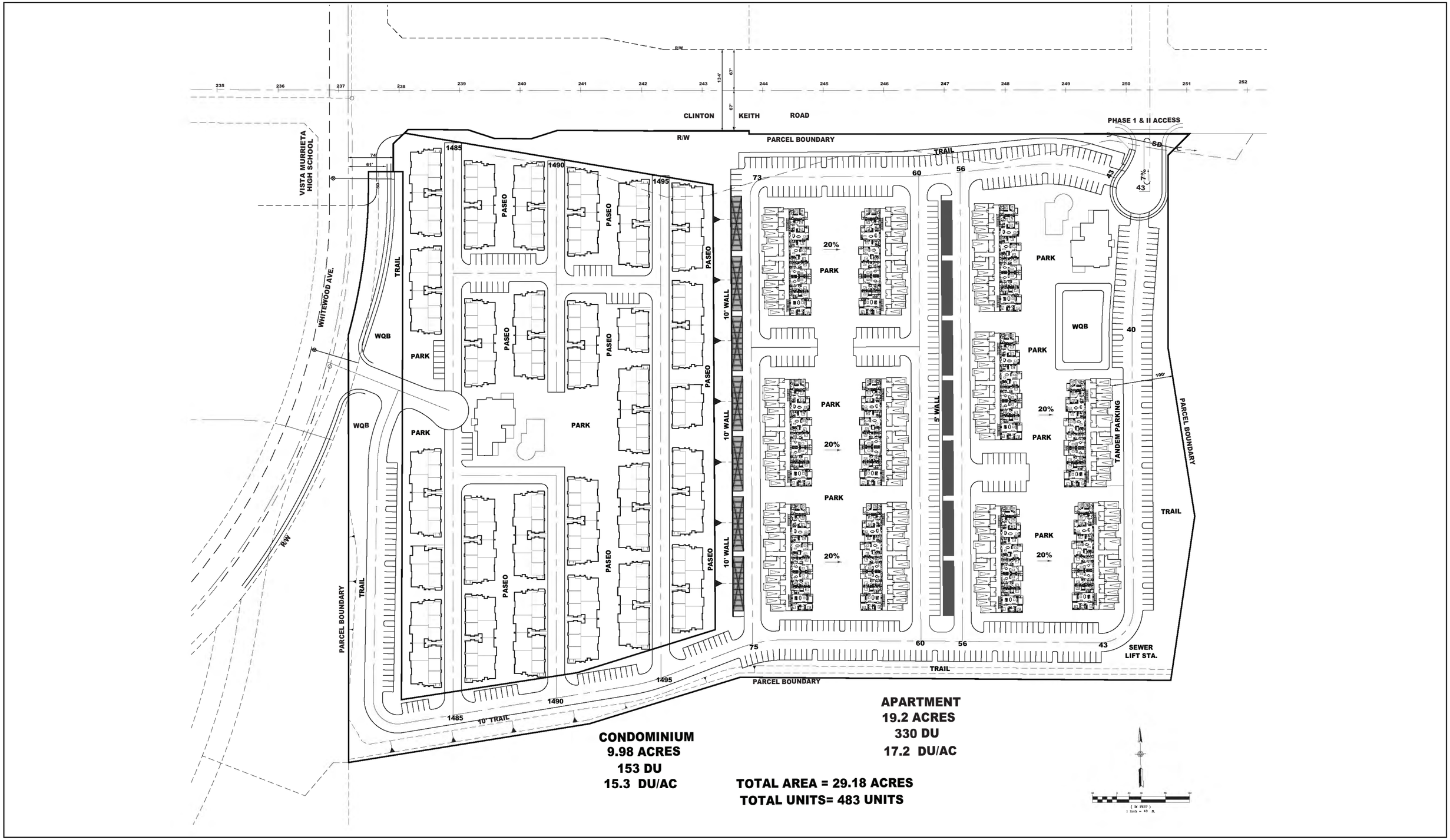

SOURCE: EDWIN SAMLIN 2021

FIGURE 2
Site Plan
Fire Protection Plan for the Whitewood 29 Project

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2 Proposed Project Site Risk Analysis

2.1 Field Assessment

A field assessment of Whitewood Condo/Apartment Project area was conducted on May 26, 2021 in order to confirm/acquire site information, document existing site conditions, and to determine potential actions for addressing the protection of the project's structures. While on site, Dudek's Fire Protection Specialist assessed the area's topography, natural vegetation and fuel loading, surrounding land use and general susceptibility to wildfire. Among the field tasks that were completed are:

- Vegetation estimates and mapping refinements
- Fuel load analysis
- Topographic features documentation
- Photograph documentation
- Confirmation/verification of hazard assumptions
- Ingress/egress documentation.
- Nearby Fire Station reconnaissance

Field observations were utilized to augment existing site data in generating the fire behavior models and formulating the fire safety measures detailed in this report.

2.2 Site Characteristics and Fire Environment

Fire environments are dynamic systems and include many types of environmental factors and site characteristics. Fires can occur in any environment where conditions are conducive to ignition and fire movement. Areas of naturally vegetated open space are typically comprised of conditions that may be favorable to wildfire spread. The three major components of fire environment are topography, climate, and vegetation (fuels). The state of each of these components and their interactions with each other determines the potential characteristics and behavior of a fire at any given moment. It is important to note that wildland fire may transition to urban fire if structures are receptive to ignition. Structure ignition depends on a variety of factors and can be prevented through a layered system of protective features including fire resistive landscapes directly adjacent the structure(s), application of known ignition resistive materials and methods, and suitable infrastructure for firefighting purposes. Understanding the existing wildland vegetation and urban fuel conditions on and adjacent the site is necessary to understand the potential for fire within and around the Proposed Project site.

The following sections discuss the site characteristics, local climate, and fire history within and surrounding the site. Whitewood Condo/Apartment Project is similar concerning topography, vegetative cover, and proximity to adjacent residential areas, available access, and planned use. The following sections discuss the characteristics of the project site at a regional scale. The intent of evaluating conditions at this macro-scale is providing a better understanding of the regional fire environment, which is not constrained by property boundary delineations.

2.2.1 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower fire spread down-slope in the absence of wind. Flat terrain tends to have little effect on fire spread, resulting in fires that are driven by wind. The Proposed Project is situated on the southeast corner of the intersection of Clinton Keith Road and Whitewood Road. The site has gently rolling slopes with elevations that range from approximately 1,425 feet above mean sea level (amsl) in the northeast portion of the site to approximately 1,525 feet amsl in the central portion of the site.

2.2.2 Climate

Throughout southern California, and specifically at the project site, climate has a large influence on fire risk. The climate of Murietta and western Riverside County is typical of a Mediterranean area, with warm, dry summers and cold, wet winters. Temperatures average (average annual) around 61°F and reach up to 100°F during the summer. Precipitation has been averaging about 14 inches and typically occurs between December and March. The prevailing wind is an on-shore flow between 7 and 11 mph from the Pacific Ocean.[2]

Fires can be a significant issue during summer and fall, before the rainy period, especially during dry Santa Ana wind events. The seasonal Santa Ana winds can be particularly strong in the Project area as warm and dry air is channeled from the dry, desert land to the east. Although Santa Ana events can occur anytime of the year, they generally occur during the autumn months, although the last few years have resulted in spring (April May) and summer events. Santa Ana winds may gust up to 75 miles per hour (mph) or higher. This phenomenon markedly increases the wildfire danger and intensity in the project area by drying out and preheating vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) as well as accelerating oxygen supply, and thereby, making possible the burning of fuels that otherwise might not burn under cooler, moister conditions.

2.2.3 Vegetation

2.2.3.1 Fuels (Vegetation)

The Proposed Project property and surrounding areas primarily support chamise chapparal, coastal sage scrub and non-native grassland plant communities. Vegetation types were were derived from an on-site field assessment of the project site. The majority of the site is vegetated with chamise chaparral, with coastal sage scrub interspersed throughout and occasional rock outcrops. The adjacent lands have similar vegetation types, with non-native grasslands as well. The vegetation cover types were assigned a corresponding fuel models for use during site fire behavior modeling. Section 3.0 describes the fire modeling conducted for the Project Area.

2.2.3.2 Vegetation Dynamics

The vegetation characteristics described above are used to model fire behavior, discussed in Section 3.0 of this FPP. Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (bark thickness, leaf size, branching patterns), and overall fuel loading. For example, non-native grass dominated plant communities become seasonally prone to ignition and produce

[2] Climate-data.org: https://en.climate-data.org/north-america/united-states-of-america/california/murrieta-5928/

lower intensity, higher spread rate fires. In comparison, sage scrub can produce higher heat intensity and higher flame lengths under strong, dry wind patterns, but does not typically ignite or spread as quickly as light, flashy grass fuels.

As described, vegetation plays a significant role in fire behavior, and is an important component to the fire behavior models discussed in this report. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes disrupts plant succession, setting plant communities to an earlier state where less fuel is present for a period of time as the plant community begins its succession again. In summary, high frequency fires tend to convert shrublands to grasslands or maintain grasslands, while fire exclusion tends to convert grasslands to shrublands, over time. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, or grading) or fuel reduction efforts are not diligently implemented. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the proposed fuel modification zones on site. The fuel modification zones on this site will consist of irrigated and maintained landscapes as well as thinned native fuel zones that will be subject to regular "disturbance" in the form of maintenance and will not be allowed to accumulate excessive biomass over time, which results in reduced fire ignition, spread rates, and intensity. Conditions adjacent the project's footprint (outside the fuel modification zones), where the wildfire threat will exist post-development, are classified as low to medium fuel loads due to the dominance of sage scrub-grass fuels.

2.2.4 Fire History

Fire history is an important component of an FPP. Fire history data provides valuable information regarding fire spread, fire frequency, most vulnerable areas, and significant ignition sources, amongst others. In turn, this understanding of why fires occur in an area and how they typically spread can then be used for pre-planning and designing defensible communities.

Fire history represented in this FPP uses the Fire and Resource Assessment Program (FRAP) database. FRAP summarizes fire perimeter data dating to the late 1800s, but which is incomplete due to the fact that it only includes fires over 10 acres in size and has incomplete perimeter data, especially for the first half of the 20th century (Syphard and Keeley 2016). However, the data does provide a summary of recorded fires and can be used to show whether large fires have occurred in the Project area, which indicates whether they may be possible in the future.

Appendix B, Project Vicinity Fire History exhibit, presents a graphical view of the project area's recorded fire history. As presented in the exhibit, there have been 20 fires recorded since 1956 by CALFIRE in their FRAP database (FRAP 2018)[3] in the vicinity of the Proposed Project, including one in the southeastern one-third portion of the site. The 20 recorded fires burned within a five mile radius of the Project Area; about 80% of the five mile radius area has no recorded fires.

Based on an analysis of the CAL FIRE FRAP fire history data set, specifically the years in which the fires burned, the average interval between wildfires in the five mile radius area was calculated to be 2.8 years with intervals ranging between one and 11 years. Based on this analysis, it is expected that wildfire that could burn in available unmaintained landscapes may occur, if weather conditions coincide, possibly every two to three years, with the realistic possibility of longer interval occurrences, as observed in the fire history records and considering the recent past and ongoing development of the region.

[3] Based on polygon GIS data from CAL FIRE's FRAP, which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2018.

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3 Anticipated Fire Behavior

3.1 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected adjacent to the project site given characteristic site features such as topography, vegetation, and weather. Dudek utilized BehavePlus software package version 6 (Andrews, Bevins, and Seli 2008) to analyze potential fire behavior. [A discussion of fire behavior modeling is presented in Appendix C, Fire Behavior Modeling.]

3.2 Fire Behavior Modeling Analysis

An analysis was conducted to evaluate fire behavior variables and to objectively predict flame lengths, intensities, and spread rates for four modeling scenarios[4]. These fire scenarios incorporated observed fuel types representing the dominant vegetation representative of the site and adjacent land, in addition to slope gradients, and wind and fuel moisture values. Modeling scenario locations were selected to better understand different fire behavior that may be experienced on or adjacent the site.

Vegetation types, which were derived from the field assessment for the project site, were classified into a fuel model. Fuel models are selected by their vegetation type, fuel stratum most likely to carry the fire, and depth and compactness of the fuels. Fire behavior modeling was conducted for vegetative types that are both on and adjacent to the proposed development. Fuel models were also assigned to illustrate post-project fire behavior changes.

Based on the anticipated pre- and post-project vegetation conditions, six different fuel models were used in the fire behavior modeling effort presented herein. Table 3.2.A provides a description of the fuel models observed that were subsequently used in the analysis for this project. Modeled areas include shrub and grass dominated ground fuels (Fuel Models GR1, SCAL15, SCAL18 and GR4). For modeling the post-development condition, fuel model assignments were re-classified to Fuel Models GR1 and NB1.

Table 3.2.A. Fuel Models used for Fire Behavior Modeling

Fuel Model Type	Title	Description	Application (Behave Run)
Existing conditions			
NB1	Urban or suburban development	Insufficient wildland fuel to carry wildland fire.	Paved roadway, hardscape (1)
GS1	Shrubs and Grass–Low Load, Arid Climate	Shrubs are about one foot high, low grass load. Spread rate moderate; flame length low.	Roadside cutbank vegetation (1)

[4] Each scenario utilizes a different set of modeling input variables including location, fuel type (vegetation), fuel moisture, weather (wind), topography (slope and aspect), and other related factors.

Table 3.2.A. Fuel Models used for Fire Behavior Modeling

Fuel Model Type	Title	Description	Application (Behave Run)
SCAL15	Chamise chaparral	The primary carrier of fire is old chamise chaparral, at least 15 years of age. Average hright about four to six feet. Spread rate very high; flame length high.	Chamise chaparral (2)
SCAL18	Coastal sage scrub/buckwheat	The primary carrier of fire is sage, buchwheat and sparse grass. Average hright about two to three feet. Spread rate moderate; flame length moderate.	CCS/buckwheat (3)
GR4	Grass–moderate load, dry climate	Grass is continuous, moderately course, with an average depth of about two feet. Spread rate very high; flame length high.	Grassland (4)
Post-Project			
FM8	Irrigated landscaping/ compact litter	The primary carrier of fire is landscaping litter, though small amounts of fine dead fuel may be present. The landscaping material is generally hydrated with high moisture content. Spread rate low; flame length low.	Fuel treatment areas (1–4)
NB1	Urban or suburban development	Insufficient wildland fuel to carry wildland fire.	Paved roadway, hardscape (1–4)

Table 3.2.B summarizes the weather and wind input variables used in the BehavePlus modeling process.

Table 3.2.B. Fuel Moisture and Wind Inputs

Variable	Weather Condition (97th Percentile)
1h Moisture	2%
10h Moisture	3%
100h Moisture	5%
Live Herbaceous Moisture	70%
Live Woody Moisture	50%
20-foot Wind Speed (mph)	40
BehavePlus Wind Adjustment Factor	0.4

Fuel model parameters are summarized in Table 1.

Table 3.2.C. Fuel Model Parameters

Fuel Model Assignment	Fuel load (tons/acre)	Fuel Bed Depth (Feet)
NB1	NA	NA
GS1	0.2	0.9
SCAL15	6.0	3.0

Table 3.2.C. Fuel Model Parameters

Fuel Model Assignment	Fuel load (tons/acre)	Fuel Bed Depth (Feet)
SCAL18	6.4	3.0
GR4	1.3	2.1
FM8	5.0	< 0.5

3.3 Fire Behavior Modeling Results

The results of fire behavior modeling analysis for pre- and post-project conditions are presented in Tables 3.3.1 and 3.3.2, respectively. Identification of modeling run (fire scenarios) locations is presented graphically in Appendix C, BehavePlus Fire Behavior Analysis.

Fire Scenario locations and descriptions:

- Scenario 1. Fire flaming front approaching from the northeast from Clinton Keith Road towards the roadside cutbank and north project boundary (from the rural residential area) (Fuel Models NB1, GS1), with north/northeastern winds. Post-development includes the fuel modification zone (Fuel Model GR1, NB1).
- Scenario 2. Fire flaming front approaching from the northeast, south of Clinton Keith Road towards the eastern boundary of the property, through the adjacent chamise chaparral (Fuel Model SCAL15), with northeastern winds. Post-development includes the fuel modification zone (Fuel Model GR1, NB1).
- Scenario 3. Fire flaming front approaching from the southwest towards the southern boundary of the property, coastal sage scrub/buckwheat (Fuel Model SCAL18), with southwestern winds. Post-development includes the fuel modification zone (Fuel Model GR1, NB1).
- Scenario 4. Fire flaming front approaching from the southwest towards the western boundary of the property, through the annual grassland (Fuel Model GR4) with southwestern winds. Post-development includes the fuel modification zone (Fuel Model GR1, NB1).

The results presented in Tables 3.3.1 and 3.3.2 depict values based on inputs to the BehavePlus software reflecting a “moment in time” and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis, but the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location would be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

3.3.1 Existing Condition

As presented in Table 3.3.1, wildfire behavior in coastal sage scrub/buckwheat fuel beds, presented as Fuel Model SCAL18, represents the most extreme conditions in Scenario 3. In this case, flame lengths are calculated to reach 25.1 feet with 40 mph winds; spread rates reach 1.0 mph. The spotting distance, where airborne embers can ignite new fires downwind of the initial fire, is calculated at 0.9 mile. In comparison, a chamise chaparral fuel type in Scenario 2 could generate flame lengths up to 18.5 feet high with a spread rate of 1.2 mph. The fire could potentially be spotting for a distance of 1.1 mile.

Table 3.3.1. Fire Behavior Modeling Results Existing Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: Pavement and roadside cutbank vegetation, 0% and 20% slope, 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model GS1	9.5	761	1.6	0.7
Scenario 2: Chamise chaparral, 10% uphill slope, 40 mph wind				
Fuel Model SCAL15	18.5	3225	1.2	1.1
Scenario 3: Coastal sage scrub/chaparral, 10% slope, 20 mph wind				
Fuel Model SCAL18	25.1	6282	1.0	0.9
Scenario 4: Grassland, 10% slope, 20 mph wind				
Fuel Model GR4	12.8	1439	1.8	0.5

Notes:
1. mph = miles per hour
2. Spotting distance from a wind driven surface fire.

3.3.2 Post-development Condition

As presented in Table 3.3.2, Dudek conducted modeling of the site for post-development fuel modification zones for this project. Fuel modification includes establishment of irrigated landscaping and hardscaping on the periphery of the proposed development. The existing fuel model assignments were re-classified for each scenario to reflect the fuel modification zones.

The fire intensity and flame lengths in untreated, open space areas would remain the same. Conversely, the FMZ areas would experience a significant reduction in flame length and intensity. The 25.1-foot long flames predicted in Scenario 3 for a coastal sage scrub/buckwheat fuel bed are reduced to 1.6 feet; the fireline intensity was reduced from 6282 BTU/ft/sec to 15 BTU/ft/sec in the irrigated landscaping fuel modification areas of the development due to the design and higher moisture contents. The pavement and hardscape in the fuel modification areas, represented as Fuel Model NB1, have no combustible material and would not contribute to the spread of fire.

Table 3.3.2. Fire Behavior Modeling Results for Post-Project Conditions

Scenario	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: Pavement, hardscape; Irrigated landscaping; 3% slope with 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.8	20	0.1	0.2
Scenario 2: Pavement, hardscape; Irrigated landscaping; 3% slope with 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.8	20	0.1	0.2
Scenario 3: Pavement, hardscape; Irrigated landscaping; 3% slope with 20 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.6	15	0.1	0.1
Scenario 4: Pavement, hardscape; Irrigated landscaping; 3% slope with 20 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.6	15	0.1	0.1

Notes:
1. mph = miles per hour
2. Spotting distance from a wind driven surface fire.

3.4 Project Area Fire Risk Assessment

Wildland fires are a common natural hazard in most of southern California with a long and extensive history. Southern California landscapes include a diverse range of plant communities, including vast tracts of shrublands and grasslands, like those found on and adjacent to Whitewood Condo/Apartment site. Wildfire in this Mediterranean-type ecosystem ultimately affects the structure and functions of vegetation communities (Keeley 1984) and will continue to have a substantial and recurring role (Keeley and Fotheringham 2003). Supporting this are the facts that 1) native landscapes, from forest to grasslands, become highly flammable each fall and 2) the climate of southern California has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds (Santa Ana) occurring during autumn after a six-month drought period each year. Based on this research, the anticipated growing population expanding into WUI areas, and the regions' fire history, it can be anticipated that periodic wildfires may start on, burn onto, or spot into the site. The most common type of fire anticipated in the vicinity of the Project Area is a wind-driven fire from the north/northeast, moving through the chaparral and sage scrub on the adjacent lands.

Therefore, it will be important that the latest fire protection technologies, developed through intensive research and real world wildfire observations and findings by fire professionals, for both ignition resistant construction and for creating defensible space in the ever-expanding WUI areas, are implemented and enforced. The Whitewood Condo/Apartment Project, once developed, would not facilitate wildfire spread and would reduce projected flame lengths to levels that would be manageable by firefighting resources for protecting the site's structures, especially given the ignition resistance of the structures and the planned ongoing maintenance of the entire site landscape.

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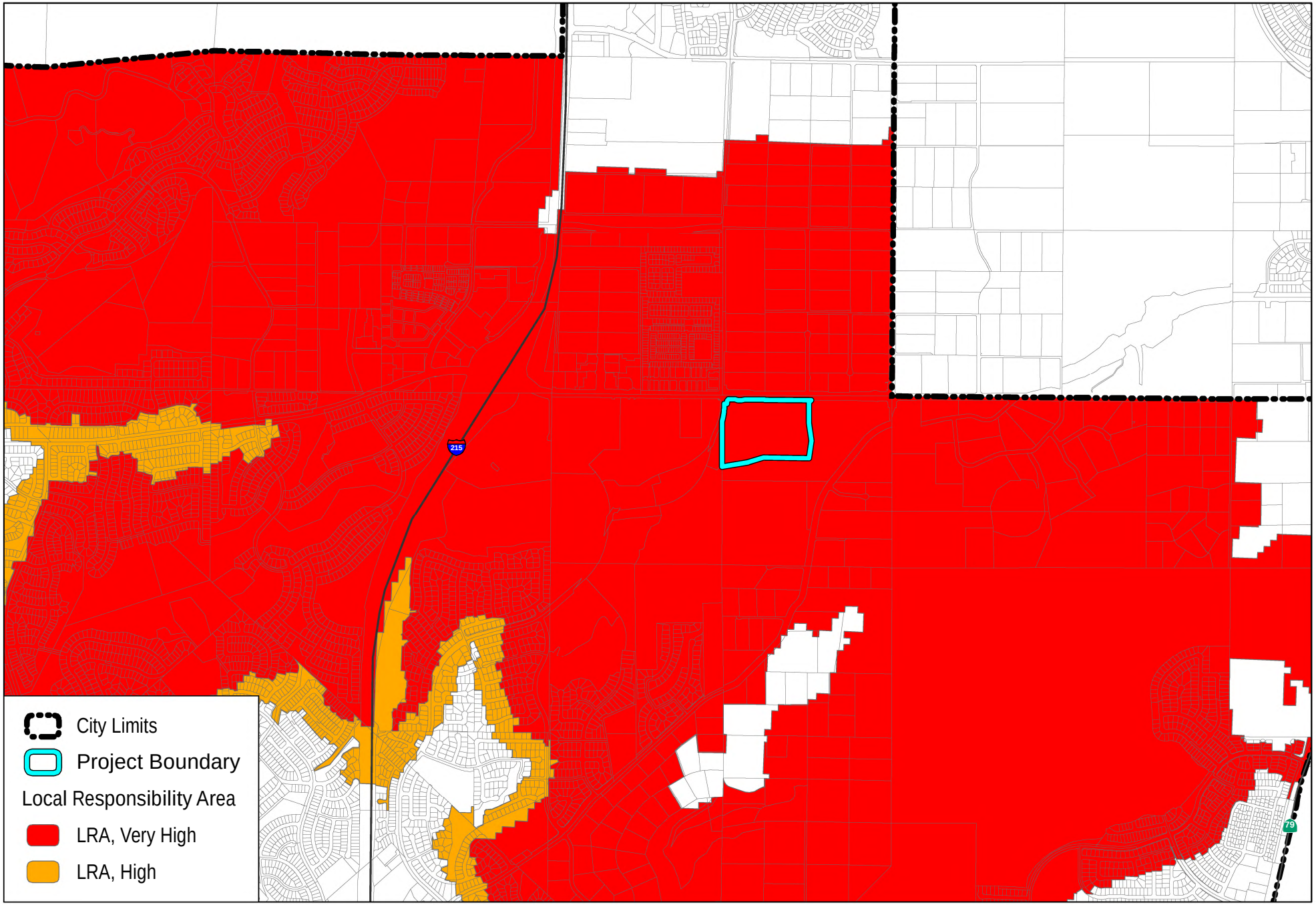

Document Path: Z:\Projects\j1405500\MAPDOC\DOCUMENT\FPP\Fig 3 Fire Hazard Severity Zone.mxd

SOURCE: PARCELS- RIVERSIDE COUNTY GIS; FIRE DATA- CALFIRE

DUDEK

FIGURE 3

Very High Fire Hazard Severity Zones

Fire Protection Plan for the Whitewood 29 Project

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Whitewood Fire Behavior Modeling Results

Fire Behavior Modeling Results Existing Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: Pavement & roadside cutbank vegetation, 0% & 20% slope, 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model GS1	9.5	761	1.6	0.7
Scenario 2: Chamise chaparral, 10% uphill slope, 40 mph wind				
Fuel Model SCAL15	18.5	3225	1.2	1.1
Scenario 3: Coastal sage scrub/chaparral, 10% slope, 20 mph wind				
Fuel Model SCAL18	25.1	6282	1.0	0.9
Scenario 4: Grassland, 10% slope, 20 mph wind				
Fuel Model GR4	12.8	1439	1.8	0.5

Notes:
1. mph = miles per hour
2. Spotting distance from a wind driven surface fire.

Fire Behavior Modeling Results for Post-Project Conditions

Scenario	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: Pavement, hardscape; Irrigated landscaping; 3% slope with 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.8	20	0.1	0.2
Scenario 2: Pavement, hardscape; Irrigated landscaping; 3% slope with 40 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.8	20	0.1	0.2
Scenario 3: Pavement, hardscape; Irrigated landscaping; 3% slope with 20 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.6	15	0.1	0.1
Scenario 4: Pavement, hardscape; Irrigated landscaping; 3% slope with 20 mph wind				
Fuel Model NB1	NA	NA	NA	NA
Fuel Model 8	1.6	15	0.1	0.1

Notes:
1. mph = miles per hour
2. Spotting distance from a wind driven surface fire.

SOURCE: AERIAL- BING MAPPING SERVICE; DEVELOPMENT- EDWIN SAMLIN 2021

DUDEK

0 250 500 1,000 Feet

FIGURE 4
BehavePlus Analysis Map
Fire Protection Plan for the Whitewood 29 Project

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4 Emergency Response And Service

4.1 Emergency Response

The project site is located within the Murietta Fire and Rescue (MFR) response area, which includes the corporate limits of the city of Murietta. Table 4.1 presents a summary of the location, equipment, staffing levels, maximum travel distance, and travel time for the two closest, existing MFR stations responding to the Project. Travel distances are derived from Google road data while travel times are calculated applying the nationally recognized Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (T=0.65 + 1.7 D, where T= time and D = distance). The ISO response travel time formula discounts speed for intersections, vehicle deceleration and acceleration, and does not include turnout time.

Table 4.1. Closest Responding MFRD Fire Stations Summary

Station No.	Location	Equipment	Staffing	Maximum Travel Distance*	Travel Time*
4	28155 Baxter Road Murietta, California	Engine Company, Brush Engine	NA	1.5 mi.	3 min. 15 sec.
2	40060 California Oaks Road Murietta, California	Truck Company, Medic Patrol Unit	NA	3.1 mi.	6 min.

* Assumes travel distance and time to the project site from either Station 4 or 2. Travel Time is one portion of the "total reflex time", which also includes call processing, dispatch, arrival and set up times.

MFR Station 4, located at 28155 Baxter Road, is staffed 24/7 with career firefighters and would provide initial response. It is equipped with one engine company, a brush engine and Battalion Chief. Station 4 will be capable of responding within 3.2 minutes to the proposed entrance of the Whitewood Condo/Apartment Project. Secondary response would be provided from MFR Station 2, which is located at 40060 California Oaks Road, and can respond within 6 minutes to the proposed entrance. Station 2 is staffed 24-hours per day and houses a Truck and Medic Patrol unit.

Within the area's emergency services system, fire and emergency medical services are also provided by other agencies. Generally, each agency is responsible for structural fire protection and wildland fire protection within their area of responsibility. However, mutual aid agreements enable non-lead fire agencies to respond to fire emergencies outside their district boundaries. In the project area, fire agencies cooperate under a statewide master mutual aid agreement for wildland fires. There are also mutual aid agreements in place with neighboring fire agencies and typically include interdependencies that exist among the region's fire protection agencies for structural and medical responses, but are primarily associated with the peripheral "edges" of each agency's boundary.

4.2 Estimated Calls and Demand for Service from the Project

The following estimated annual emergency call volume generated by the Project is based upon per capita data for 2018 from MFR calls within their jurisdiction.

- Total population[5] served: 113,541
- Average annual calls:13,248.[6] Per capita call generation: 0.12
- Average annual fire calls, including structure, vegetation, vehicle fires, and other fire calls (8% of calls): 1,068. Per capita call generation: 0.009.
- Average annual Emergency Medical Services (67% of total calls): 8,868. Per capita call generation: 0.078
- Average annual other calls (Explosion, Hazardous Materials, Good Intent, Public Service, etc.; 25% of total calls): 3,372. Per capita call generation: 0.030

Using the data above, the estimated annual emergency call volume for the Project site was calculated. In order to provide this conceptual estimate, Dudek made assumptions regarding the estimated population within the Whitewood Condo/Apartment Project (468 units x 2.3 persons per unit). Based on this information, the estimated total population of the Project site is projected to be 1,077 persons. The calculated call volumes by type of call are provided in Table 4.2.

Table 4.2. Calculated Call Volume (Conceptual Based on 1,077 Persons)

Type of Call	Per Capita Call Generation Factor	Number of Estimated Annual Calls
Total Other Calls	0.030	30
Total Fires	0.009	10
Total EMS Calls	0.078	84
Total Calls	0.12	124

As mentioned, the Project will increase the call volume at a rate of a conservatively calculated (the actual number of calls may be lower than this estimate) 124 calls per year (2.4 calls per week or 10 calls per month). Fire Stations 4 and 2 combined average annual emergency responses in[7] is approximately 7,200 calls (20 calls per day). The level of service demand for the Project raises overall call volume, but is not anticipated to impact the existing fire stations to a point that they cannot meet the demand. When the Whitewood Condo/Apartment Project site is built out, Fire Stations 2 and 4 could potentially respond to an additional 2.4 calls per week combined.

4.3 Cumulative Impact Analysis

Cumulative impacts from multiple projects within a fire agency's jurisdiction, like MFR can cause fire response service decline and must be analyzed. The Proposed Project represents a development that would increase the existing call volume by 2.4 calls per week, on average. The resulting impact on fire services has been analyzed within this report and despite the population increase and anticipated call volume increase, the existing fire service delivery system is considered to have capacity to serve the Proposed Project. When compared to standard utilization rates for busy (10 calls per day for an urban station) fire stations (Hunt 2010), it is clear there is capacity to serve the Proposed Project.

5 City of Murietta 2018 Southern California Association of Government Annual Report
6 Based on MFR Monthly Report Data from February 2020 to May 2021; https://www.murrietaca.gov/232/Fire-Administration
7 Ibid

Despite the relatively low increase in number of calls per year from the Proposed Project, it contributes to the cumulative impact on fire services, when considered with other anticipated projects within the MFR's primary response area.

The City responded to approximately 13,248 calls for the 12 month period ending in May 2021.[8] This equates to an average of 7.3 calls per day per station. Stations 2 and 3 respond to higher call volumes than this average and the other stations respond to fewer. The increase in additional calls per year, depending on where those calls originate, could result in a significant impact and negatively affect MFR's response capability. The addition of a sixth fire station, which is currently being explored by MFR, would mitigate this additional call volume, but would need to be situated where it could respond to the most new calls, or reduce the load for otherwise busy fire stations.

The Proposed Projects' as well as other area projects that may be approved, provide revenue for fire resources through funding via tax allocations and fire impact fees. This revenue source is expected to fund capital improvements to enhance MFR's response capabilities and at least maintain the current standards for firefighting and emergency response. The City is contemplating constructing a sixth fire station and contributions from the Proposed Project and other City projects could be allocated toward ongoing maintenance of that station. Over the long term, it is anticipated that MFR will be able to perform its mission into the future at levels consistent with the its' internal response time goals.

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[8] Based on MFR Monthly Report Data from February 2020 to May 2021; https://www.murrietaca.gov/232/Fire-Administration

5 Fire Safety Requirements- Infrastructure, Building Ignition Resistance, And Defensible Space

The MFR Fire Code and 2019 CFC and 2019 CBC (adopted by reference with several modifications) governs the building, infrastructure, and defensible space measures detailed in this FPP; the project will meet applicable codes. The following summaries highlight important fire protection features.

Prior to bringing combustible materials onto the site, utilities shall be in place, fire hydrants operational, an approved all-weather roadway, or an approved road surface alternative in place, and interim fuel modification zones established and approved.

A response map update, including roads and fire hydrant locations, in a format compatible with current mapping standards shall be provided to MFR.

5.1 Roads

5.1.1 Access

Site access, including road widths and connectivity, must comply with the requirements of the MFR and will include:

- Primary access to the Project site will be provided by Whitewood Road and Clinton Keith Road; proposed interior streets and will facilitate access throughout the site. Other interior roads will be provided to meet fire department access requirements to each structure. The loop roadways and all interior roads are 28 feet wide, unobstructed, and are capable of supporting an imposed load of at least 75,000 pounds (lbs.).
- Interior circulation streets include all roadways that are considered common or primary roadways for traffic flow through the site and for fire department access serving all proposed structures. Dead-end streets serving buildings that are longer than 150 feet shall have approved provisions for fire apparatus access.
- All Project roads will be constructed to minimum 28-foot, unobstructed widths and shall be improved with aggregate cement or asphalt paving materials.
- Private and public streets for each phase will meet all fire code requirements and/or exceptions for maximum allowable dead-end distance, paving, and fuel management prior to combustibles being brought to the site.
- Vertical clearance of vegetation (lowest-hanging tree limbs), along roadways will be maintained at clearances of 13 feet, 6 inches to allow fire engines passage. Unobstructed vertical clearance must be clear to the sky to allow aerial ladder truck operation.
- Roads with a median or center divider will have 16 feet unobstructed width on both sides of the center median or divider. Maximum road grade will not exceed 15%.
- Fire apparatus turnarounds will meet requirements and MFR Fire Prevention Standards.

- Where roadways and/or driveways are unable to provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of each structure, alternative access/fire protection measures will be provided. [Note: Four access road/driveways within the condominimum portion of the development exceed the maximum length of 150 feet without providing an approved turnaround. The roads range from 170 feet to 203 feet. Access to the buildings on three of these streets may be practical from Cinton Keith Road; additional assessment, including identifying hydrant locations, will be necessary in order to determine if it is feasible or not. If not, alternative fire protection measures may be necessary.]
- Roadway design features (e.g., speed bumps, humps, speed control dips, planters, and fountains) that could interfere with emergency apparatus response speeds and required unobstructed access road widths will not be installed or allowed to remain on roadways. Traffic Calming features may be allowed following review and approval of the fire code official.
- Access roads shall be completed and paved prior to issuance of building permits and prior to the occurrence of combustible construction.

5.1.2 Maximum Dead-End Road (cul-de-sac) Length

- Both of the construction phases/development areas have one primary ingress/egress road and connects to the other area for secondary access. Dead end streets longer than 150 feet shall have approved provisions for fire apparatus access.
- Fire apparatus turnarounds to include turning radius widths approved by MFR.

5.1.3 Gates

No gates are currently proposed.

5.1.4 Driveways

Any structure that is 150 feet or more from a common street in the development shall have a paved fire apparatus access roads meeting the following specifications:

- Grades 15% or less with surfacing and sub-base consistent with .

5.1.5 Premises Identification

Identification of roads and structures will comply with MFR Fire Prevention Standards, as follows:

- All multi-family structures are required to be identified by street address numbers on the structure. Numbers to be minimum 12 inches high with one-inch wide stroke, on all sides of each strucutre. Numbers shall be displayed at the property entrance.
- Multiple structures located off common driveways or roadways will include posting addresses on structures and on the entrance to individual driveway/road or at the entrance to the common driveway/ road for faster emergency response.
- Roof addresses are required, shall be a minimum of three feet in height, installed on a contrasting background, be durable enough for the weather conditions exposed, and face the street in which it is addressed.

- Lighted directory maps will be installed at the two driveway entrances.
- Proposed private and public streets within the development will be named, with the proper signage installed at intersections to satisfaction of the Department of Public Works.
- Streets will have street names posted on non-combustible street signposts. Letters/numbers will be per MFR standards.
- Temporary street signs shall be installed on all street corners within Whitewood Condo/Apartment Project Projects prior to the placing of combustible materials on site. Permanent signs shall be installed prior to occupancy of buildings.

5.1.6 Ongoing Infrastructure Maintenance

Whitewood Condo/Apartment Project Owner/Property Management Company shall be responsible for long term funding and maintenance of FMZs and internal private roads through annual HOA fees or similar measures.

5.1.7 Pre-Construction Requirements

Prior to bringing lumber or combustible materials onto the site, site improvements within the active development area shall be in place, including utilities, operable fire hydrants, an approved roadway surface, and fuel modification zones established. These features will be approved by the fire department their designee prior to combustibles being brought on site.[9]

5.2 Ignition Resistant Construction and Fire Protection Systems

All new structures within Whitewood Condo/Apartment Project Proposed Project site will be constructed to Building Code standards. Each of the proposed buildings will comply with the enhanced ignition-resistant construction standards of the 2019 CBC (Chapter 7A). These requirements address roofs, eaves, exterior walls, vents, appendages, windows and doors, and result in hardened structures that have been proven to perform at high levels (resist ignition) during the typically short duration of exposure to the flaming-front of burning vegetation from wildfires. Appendix D provides a summary of the requirements for ignition resistant construction.

While these standards will provide a high level of protection to structures in this development, there is no guarantee that compliance with these standards will prevent damage or destruction of structures by fire in all cases.

5.3 Fire Protection Systems

5.3.1 Water Supply

The Whitewood Condo/Apartment Project site is not currently served by a local water district (outside of district boundaries); the Eastern Municipal Water District provides service for the areas surrounding the project site. There is currently a 12-inch water main within the Whitewood Road right-of-way. Water service arrangement will

[9] Ordinance 555-20 requires all roadways and fire protection to be installed, tested and accepted prior to combustible construction; MFR will allow the first lift of asphalt as long as it will hod the imposed load of fire apparatus at 75,000 pounds.

need to be made to supply sufficient fire flows and pressure to meet the demands for required on site fire hydrants and interior fire sprinkler systems for all structures.

5.3.2 Hydrants

Fire Hydrants shall be located along fire access roadways and adjacent to each structure, as determined by the MFR and current fire code requirements to meet operational needs. Fire Hydrants will be consistent with applicable Design Standards.

5.3.3 Fire Sprinklers

All structures, of any occupancy type, will be protected by an automatic, internal fire sprinkler system. Fire sprinklers systems shall be in accordance with MFR, and National Fire Protection Association (NFPA) Standards. Fire sprinkler plans for each structure will be submitted and reviewed by MFR for compliance with the applicable fire and life safety regulations, codes, and ordinances as well as the MFR Fire Prevention Standards for fire protection systems.

5.4 Defensible Space and Vegetation Management

5.4.1 Defensible Space

WUI fire protection requires a systems approach, which includes the components of infrastructure and water, structural safeguards (addressed in the FPP), and adequate defensible space setbacks. This section provides defensible space details for Whitewood Condo/Apartment Project.

5.4.2 Fuel Modification Zone Requirements

A fuel modification zone (FMZ) is a strip of land where combustible vegetation has been removed and/or modified and partially or totally replaced with more adequately spaced, drought-tolerant, fire resistant plants in order to provide a reasonable level of protection to structures from wildland fire. The landscape/fuel modification installation for Whitewood Condo/Apartment Project consists of a 100-foot wide fuel management area 1) from the property boundary extending inwards towards the buildings on the east, south and southwest sides of the project (setback from adjacent open space), and 2) from the buildings extending outwards on the north and northwest sides of the project (adjacent to paved roadways).

Cohen (1995) performed structure ignition fire research studies that suggest, as a rule-of-thumb, larger flame lengths and widths require wider fuel modification zones to reduce structure ignition. For example, valid Structure Ignition Assessment Modeling results indicate that a 20-foot-high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas, a 70-foot-high flame requires about 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). For this fire study example, bare wood was used, which is considerably more combustible than the non-combustible exterior materials for the proposed project.

Based on the site plan, the majority of the project site provides for 100 feet of on-site FMZ, which consists of asphalt roadways and parking stalls, fully irrigated landscaping, and a 10-foot wide trail. However, in the northwest portion of the project, part of the FMZ is off site utilizing portions of Whitewood Road and Clinton Keith Road. The Project's

Fuel Modification Plan is presented graphically (Appendix E) and shows the locations for the 100 feet of FMZ, both on and off site. Vegetation management will also be implemented as an interim FMZ throughout the construction phases. FMZs will be implemented according to existing requirements for the entire Project.

5.4.2.1 Fuel Modification Zone Description (0-100 feet wide)

Most of the interior landscaped areas also will meet FMZ standards. However, the FMZ occurs around the perimeter of the project's wildland exposures at Project build out. The FMZ will be 100 feet wide starting from the property boundary and moving inwards where adjacent to open space; The FMZ will be 100 feet extending outward from buildings along thenorth and northwest properby boundaries. All highly flammable native vegetation shall be removed. The FMZ will be planted with drought-tolerant, less flammable plants. The Proposed Project's plant palette will be approved by the fire department. A permanent, automatic irrigation system will be installed the FMZ to maintain hydrated plants.

The FMZ includes the following key components:

- All trees shall be planted and maintained at a minimum of 10 feet from the tree's drip line to any combustible structure
- Tree spacing of a minimum 10 feet between canopies
- Mature trees shall be limbed to eight feet or three times the height of understory plants to prevent ladder fuels, whichever is greater. No tree limb encroachment within 10 feet of a structure or chimney, including outside barbecues or fireplaces
- Tree maintenance includes limbing-up (canopy raising) six feet or one-third the height of the tree
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, regular trimming to prevent ladder fuels[10].
- A minimum of 36 inches wide pathway with unobstructed vertical clearance around the exterior of each structure (360°) provided for firefighter access (2019 CFC, Section 503.1.1). Within this clearance area, landscape such as low ground covers and shrubs are permitted so long as their placement and mature height do not impede firefighter access, consistent with purpose of this guideline.
- Trees and tree form shrub species that naturally grow to heights that exceed two feet shall be vertically pruned to prevent ladder fuels.
- Ground covers within first three feet from structure are restricted to non-flammable materials, including stone, rock, concrete, bare soil, or other. Combustible ground covers, such as mulch or wood chips, are prohibited adjacent to structures with an exterior stucco wall and weep screed.

5.4.3 Vegetation Management Maintenance

Vegetation management, i.e., assessment of fuel modification zone condition and removal of dead and dying material , shall be completed annually by May 1 of each year and more often as needed for fire safety, as

[10] Plant material that can carry a fire burning in low-growing vegetation to taller vegetation is called ladder fuel. Examples of ladder fuels include low-lying tree branches and shrubs, climbing vines, and tree-form shrubs underneath the canopy of a large tree.

determined by the MFR. Whitewood Condo/Apartment shall be responsible for all vegetation management throughout the Project, in compliance with the project FPP.

The permanent FMZ required for Whitewood Condo/Apartment Project will be maintained by the property owner who will be responsible for FMZ vegetation management once the project is built out and the adjacent areas are developed. The Owner or Property Manager will be responsible for vegetation management in perpetuity. A third-party consultant shall be hired annually to perform an inspection and provide a written report of compliance to MFR (filed on or before May 1 each year). This requirement shall be a disclosure document if the property is sold and is required of future owners as well.

On-going/as-needed fuel modification zone maintenance during the interim period while Whitewood Condo/Apartment Project is built out and adjacent parcels are developed, which may be one or more years, will include necessary measures for consistency with the FPP, including:

- Removal or thinning of undesirable combustible vegetation and replacement of dead or dying landscaping.
- Maintaining ground cover at a height not to exceed 18 inches. Annual grasses and weeds shall be maintained at a height not to exceed three inches.
- Removing accumulated plant litter and dead wood. Debris and trimmings produced by thinning and pruning should be removed from the site or chipped and evenly dispersed in the same area to a maximum depth of four-inches.
- Maintaining manual and automatic irrigation systems for operational integrity and programming. Effectiveness should be regularly evaluated to avoid over or under-watering.
- Complying with these FPP measures on a year-round basis. Annual inspections are conducted following the natural drying of grasses and fine fuels, between the months of May and June, depending on precipitation during the winter and spring months.

5.4.4 Environmentally Sensitive Areas/Open Space

Once the FMZs are in place, there will not be a need to expand them as they have been planned to meet the fire code. However, if unforeseen circumstances were to arise that required hazard reduction within an area considered environmentally sensitive or part of the Multispecies Conservation Plan, it may require approval from the County and the appropriate resource agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) prior to any vegetation management activities occurring within those areas.

5.4.5 Prohibited Plants

Certain plants are considered prohibited in the landscape due to characteristics that make them highly flammable. These characteristics can be physical (structure promotes ignition or combustion) or chemical (volatile chemicals increase flammability or combustion characteristics). The plants included in the Prohibited Plant List (Appendix F) are unacceptable from a fire safety standpoint, and will not be planted on the site or allowed to establish opportunistically within fuel modification zones or landscaped areas.

5.4.6 Construction Phase Vegetation Management

Vegetation management measures shall be implemented at commencement and throughout the construction phase. Vegetation management shall be performed pursuant to the FAHJ on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks shall be created around all grading, site work, and other construction activities in areas where there is flammable vegetation.

6 Wildfire Education Program

The owners of the Whitewood Condo/Apartment Project will provide a proactive educational component disclosing the potential wildfire risk and this report's findings. This educational information must include maintaining the landscape and structural components according to the appropriate standards and embracing a preparedness stance on evacuation.

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7 Conclusion

This FPP for The Whitewood Condo/Apartment Project provides guidance for vegetation maintenance for the proposed FMZ and landscaped areas on the site. As described, vegetation maintenance measures will be provided on all sides of the proposed development. The fire safety measures provided in this FPP have been designed specifically for the Whitewood Condo/Apartment Project. This analysis and its fire protection justifications are supported by fire science research, results from previous wildfire incidents, and fire agencies that have approved these concepts. The Proposed Project design features, asphalt roads and parking stalls, and a fully irrigated landscape, along with the proposed fire protection measures, would provide a level of safety equal to a 100-foot wide FMZ.

Ultimately, it is the intent of this FPP to guide the fire protection efforts for the Whitewood Condo/Apartment Project in a comprehensive manner. Implementation of the measures detailed in this FPP will reduce the risk of wildfire at this site and will improve the ability of firefighters to fight fires on and adjacent to the property, irrespective of the cause or location of ignition.

It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not burn. Precautions and minimizing actions identified in this report are designed to reduce the likelihood that fire will impinge upon Whitewood Condo/Apartment Project assets or threaten its visitors. Additionally, there are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required construction features provided by the applicable codes and the fuel modification measures provided in this FPP will reduce the site's vulnerability to wildfire. It will also help accomplish the goal of this FPP to assist firefighters in their efforts to defend structures.

It is recommended that Whitewood Condo/Apartment Project maintain a conservative approach to fire safety. This approach must include maintaining the landscape and structural components according to the appropriate standards and embracing a preparedness stance on evacuation. This project is not to be considered a shelter-in-place development. However, the fire agencies and/or law enforcement officials may, during an emergency, as they would for any new development providing the layers of fire protection as the Whitewood Condo/Apartment Project, determine that it is safer to temporarily refuge residents on the site. When an evacuation is ordered, it will occur according to pre-established evacuation decision points or as soon as notice to evacuate is received, which may vary depending on many environmental and other factors. Fire is a dynamic and somewhat unpredictable occurrence and it is important for anyone living at the WUI to educate themselves on practices that will improve safety.

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8 List of Preparers

Project Manager

Michael Huff
Discipline Director
Dudek

Fire Protection Plan Preparer

Doug Nickles
Senior Fire Protection Specialist
Dudek

Computer Aided Design/Drafting

Lesley Terry
CADD Specialist
Dudek

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9 References

(including references from Appendices)

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Appendix A

Representative Site Photographs

Whitewood Condo / Apartment Project Fuels Photo Series

JUNE 2021

Attachment 1

Whitewood Condo / Apartment Project
Fuels Photo Series

Photograph 1 and 2. Photographs show the terrain and vegetation looking north and northeast from the southwest corner of the proposed project. Whitewood Road is visible on the left side of Photograph 1.

Whitewood Condo / Apartment Project
Fuels Photo Series

Photographs 3 and 4. Looking north of proposed development. The roadside vegetation and Clinton Keith Road are immediately north of the project boundary and represent the fuel type and fuel loading to remain along this portion of proposed project. North of the road is rural residential development.

Whitewood Condo / Apartment Project
Fuels Photo Series

Photograph 5

Photograph 6

Photographs 5 and 6 show the typical fuel type (chamise chaparral with scattered sage scrub) and fuel loading adjacent to the northeastern edge of the proposed development in the adjacent open space reserve.

Whitewood Condo / Apartment Project
Fuels Photo Series

Photographs 7 and 8. Looking southeast of proposed development. The coastal sage scrub and buckwheat vegetation is typical of the fuel type and fuel loading to remain in the open space reserve area adjacent to the southeast portion of proposed project. Some rural residential property is visible in the distance of Photograph 8.

Whitewood Condo / Apartment Project
Fuels Photo Series

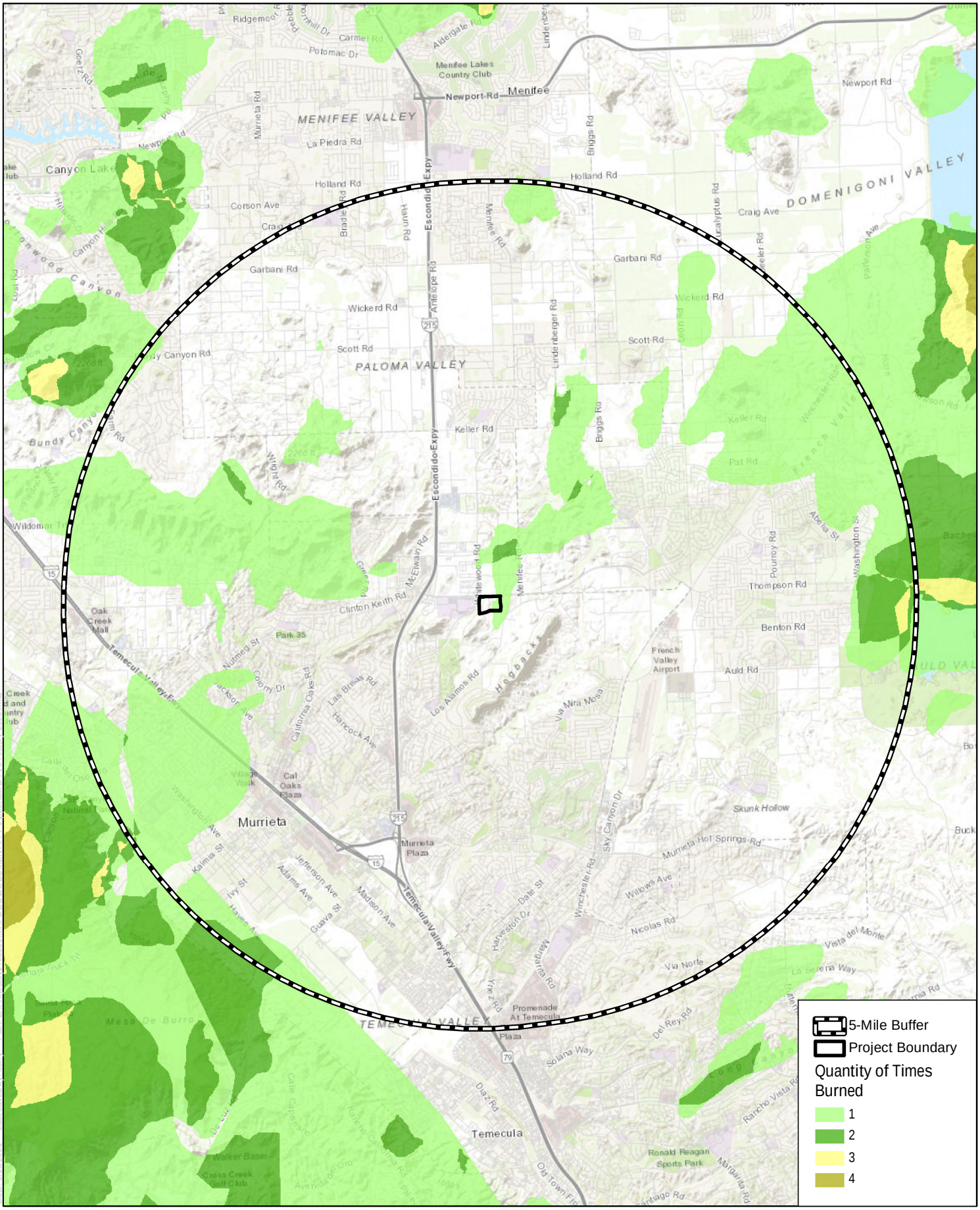
Photographs 9 and 10. Looking at the adjacent land southwest of proposed development. The grassland vegetation is typical of the fuel type and fuel loading to remain in the adjacent open space reserve area southwest of the proposed project.

Whitewood Condo / Apartment Project
Fuels Photo Series

Photograph 11 and 12. Looking west from the proposed project across Whitewood Road towards Vista Murrieta High School.

Appendix B

Project Vicinity Fire History Map



SOURCE: BASE MAP- ESRI MAPPING SERVICE; FIRE DATA-CALFIRE 2020

DUDEK

0 1 2 Miles

APPENDIX B

Fire History Map

Fire Protection Plan for the Whitewood 29 Project

Appendix C

BehavePlus Fire Behavior Analysis

1 Fire Behavior Modeling Background

Fire behavior modeling has been used by researchers for approximately 50+ years to predict how a fire will move through a given landscape (Linn 2003). The models have had varied complexities and applications throughout the years. One model has become the most widely used for predicting fire behavior on a given landscape. That model, known as "BEHAVE," was developed by the U. S. Government (USDA Forest Service, Rocky Mountain Research Station) and has been in use since 1984. Since that time, it has undergone continued research, improvements, and refinement. The current version, BehavePlus, V6, includes the latest updates incorporating years of research and testing. Numerous studies have been completed testing the validity of the fire behavior models' ability to predict fire behavior given site specific inputs. One of the most successful ways the model has been improved has been through post-wildfire modeling (Brown 1972, Lawson 1972, Sneeuwjagt and Frandsen 1977, Andrews 1980, Brown 1982, Rothermel and Rinehart 1983, Bushey 1985, McAlpine and Xanthopoulos 1989, Grabner, et. al. 1994, Marsden-Smedley and Catchpole 1995, Grabner 1996, Alexander 1998, Grabner et al. 2001, Arca et al. 2005). In this type of study, BehavePlus is used to model fire behavior based on pre-fire conditions in an area that recently burned. Real-world fire behavior, documented during the wildfire, can then be compared to the prediction results of BehavePlus and refinements to the fuel models incorporated, retested, and so on.

Fire behavior modeling includes a high level of analysis and information detail to arrive at reasonably accurate representations of how wildfire would move through available fuels on a given site. Fire behavior calculations are based on site specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. Predicting wildland fire behavior is not an exact science. As such, the minute-by-minute movement of a fire will probably never be predictable, especially when considering the variable state of weather and the fact that weather conditions are typically estimated from forecasts made many hours before a fire. Nevertheless, field-tested and experienced judgment in assessing the fire environment, coupled with a systematic method of calculating fire behavior yields surprisingly accurate results. To be used effectively, the basic assumptions and limitations of fire behavior modeling applications must be understood.

1. First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is the dead fuels less than 0.25 inches in diameter. These are the fine fuels that carry fire. Fuels greater than one inch have little effect, while fuels greater than three inches have no effect on fire behavior.
2. Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within six feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
3. Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, creating their own weather, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
4. Fourth, fire behavior computer modeling systems are not intended for determining sufficient fuel modification zone/defensible space widths. However, it does provide the average length of the flames, which is a key element for determining defensible space distances for minimizing structure ignition.

Although BehavePlus has limitations, it can still provide valuable fire behavior predictions, which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur in a particular landscape. The type and quantity will depend upon soil, climate, geographic features, and fire history. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

2 Modeling Inputs

2.1 Fuels

The seven fuel characteristics help to define the 13 standard fire behavior fuel models (Anderson 1982). According to the model classifications, fuel models used for fire behavior modeling (BehavePlus) have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface-to-volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in modeling efforts. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models:

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

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 additional fire behavior fuel models (Scott and Burgan 2005) developed for refining use of the BehavePlus modeling system. These models attempt to improve the accuracy of the 13 standard fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the 40 new fuel models:

- Non-burnable Models NB1, NB2, NB3, NB8, NB9
- Grass Models GR1 through GR9
- Grass shrub Models GS1 through GS4
- Shrub Models SH1 through SH9
- Timber understory Models TU1 through TU5
- Timber litter Models TL1 through TL9
- Slash blowdown Models SB1 through SB4.

For each fire behavior analyses, fuel model assignments are based on observed field conditions. As is customary for this type of analysis, the terrain and fuels directly adjacent to the proposed development are used for determining flame lengths and fire spread. It is these fuels that would have the potential to affect a project's structures from a radiant and convective heat perspective, as well as from direct flame impingement.

Fuel beds, including grass, shrubs, timber and slash, may be observed on and adjacent to a proposed development. Often fuel types may produce flying embers that could affect a project; defenses can be built into a project design to minimize ember generation and potential impact. In most instances, various combinations of fuels are observed and the predominate fuel likely to carry the flaming front of a wildfire determined the fuel model selected.

Modeling of the site is also conducted for post-development recommendations for this project, including fuel treatment proposed as part of the site preparation and ongoing vegetation management. Fuel modification usually includes routine vegetation management around structures, improvements, alongside roadways, and infrastructure, as well as the project periphery.

2.2 Weather

Analyses are conducted for conservative, worst case, 90th percentile weather condition scenarios. Fuel moisture and wind speed information data is incorporated into the BehavePlus modeling runs. The input wind speed and direction is roughly an average surface wind at 20 feet above the vegetation over the analysis area.

2.3 Slope

Slope is a measure of angle in degrees from horizontal and can be presented in units of degrees or percent. Slope is important in fire behavior analysis as it affects the exposure of fuel beds. Additionally, fires burning uphill spread faster than those burning on flat terrain or downhill as uphill vegetation is pre-heated and dried in advance of the flaming front, resulting in faster ignition rates. For the BehavePlus analysis, slope values are determined by field observation and use of topographical data at the locations selected for each modeling scenario.

3 BehavePlus Analysis

To objectively predict flame lengths, intensities, and spread rates, the BehavePlus V6 fire behavior modeling system (Andrews, Bevins, and Seli 2004) is used in one or more modeling scenarios and incorporates observed fuel types representing the dominant vegetative fuels, slope gradients, and wind and fuel moisture values. Modeling scenario locations are selected to better understand different fire behavior that may be experienced on or adjacent to the site.

Fuel modification includes fuel treatment proposed as part of the site preparation and ongoing vegetation management. For modeling the post-development condition, fuel model assignments are re-classified for each scenario. The fuel treatments in usually result in noticeable reductions of both flame length and intensity.

It should be noted that the results (outputs) depict values based on inputs to the BehavePlus software. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis, but models provide a worst-case wildfire condition as part of a conservative approach. Further, this modeling analysis assumes a correlation between the site vegetation and fuel model characteristics. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

The Fire Suppression Information in Table B-1 pertains to interpretation of flame length and fireline intensity as it relates to fire suppression efforts. Calculated flame lengths under 4.0 feet tall, fire fighters should be able to conduct a direct attack on the fire.

Table B-1. Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4	Under 100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8	100-500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11	500-1000	Fires may present serious control problems -- torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11	Over 1000	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

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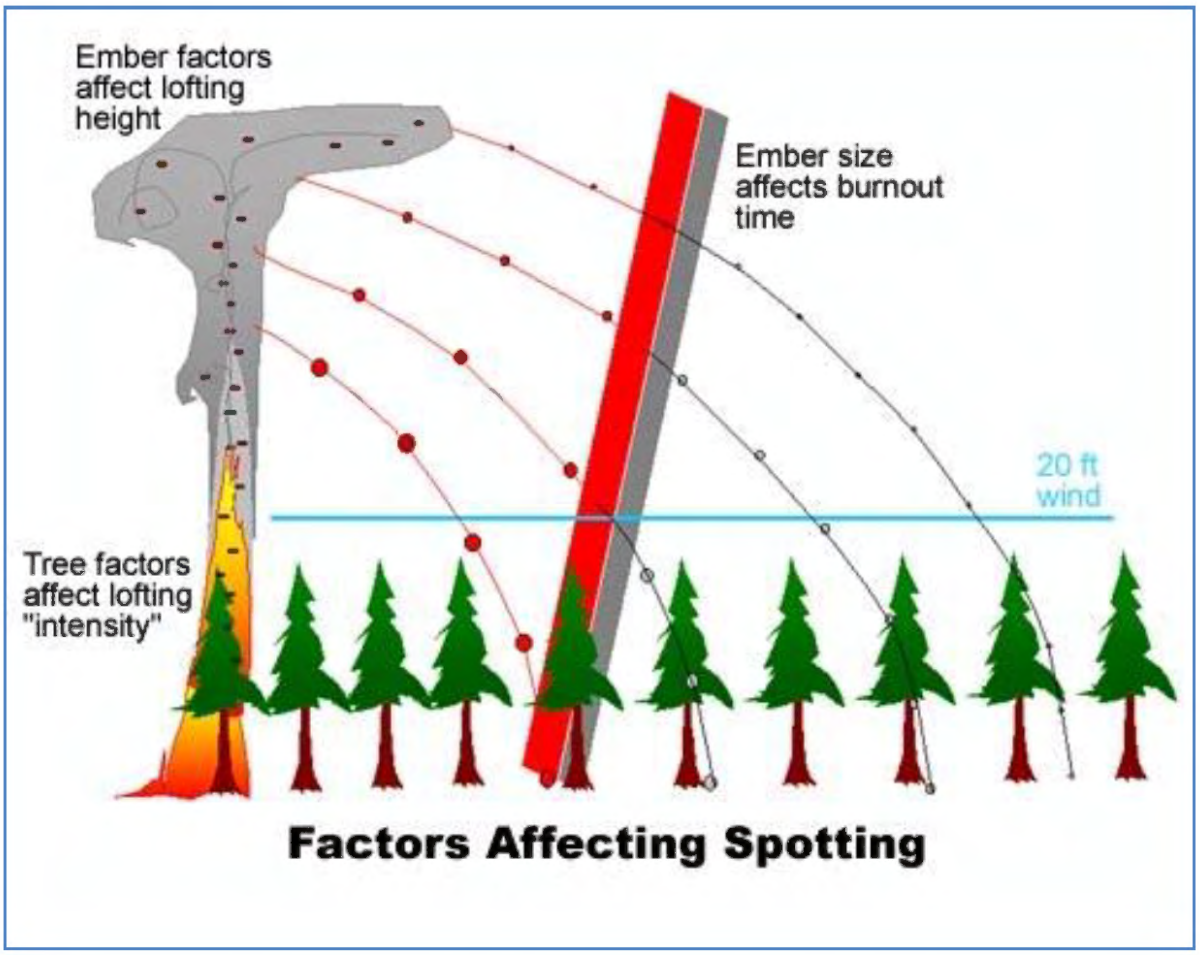
Figure 1. Flame Length

Factors affecting spotting



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Appendix D

Ignition-Resistant Construction Requirements

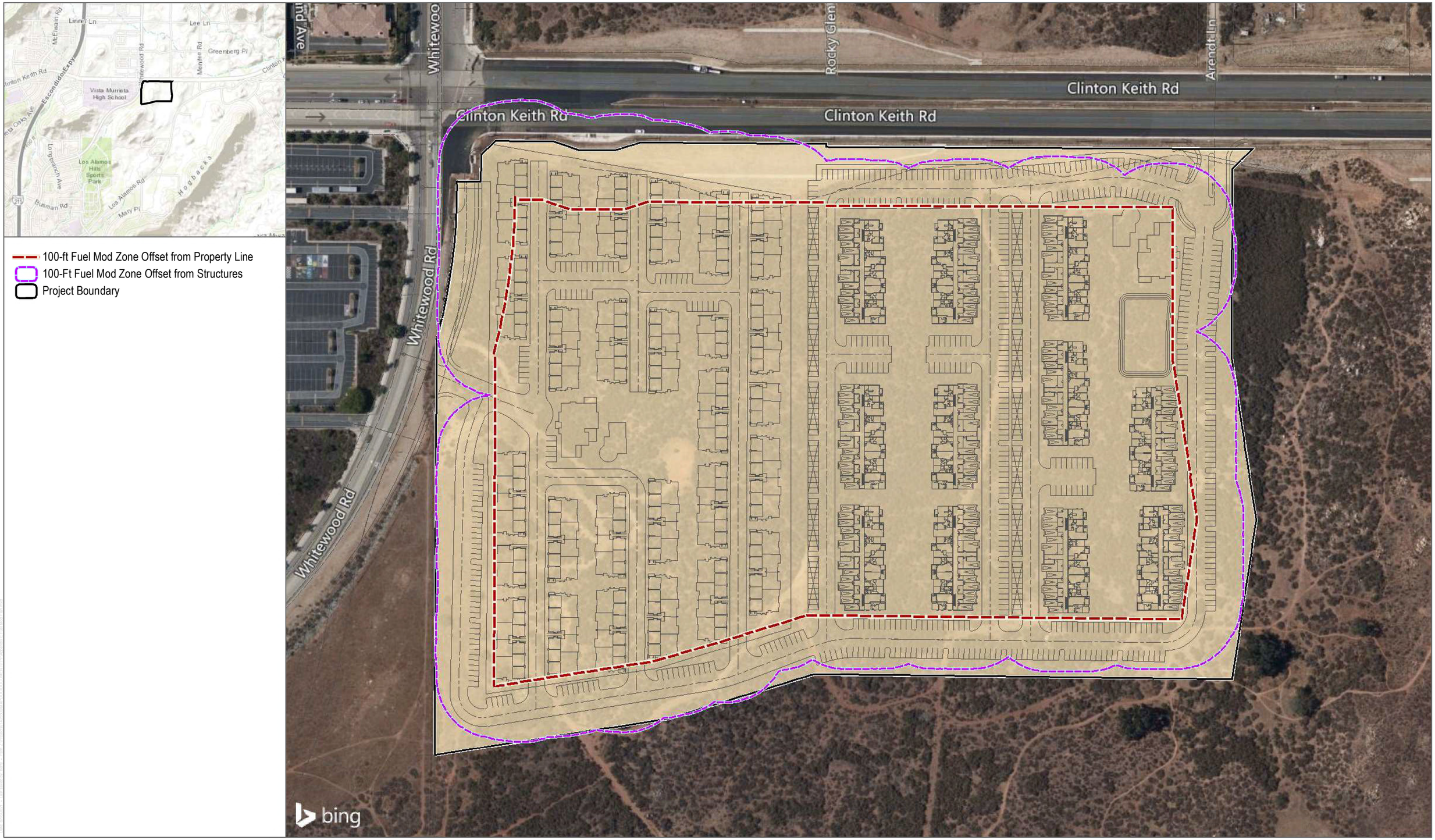
As of the date of this fire protection plan, the following are the requirements for ignition resistant construction for The Proposed Project, including requirements under Chapter 7A of the California Building Code (CBC). In addition, exterior building construction including roofs, eaves, exterior walls, doors, windows, decks, and other attachments must meet the most current CBC Chapter 7A ignition resistance requirements at the time of building permit application.

1. All structures will be built with a Class A roof assembly, including a Class A roof covering. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.
2. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum 72 pound mineral-surfaced non-perforated cap sheet complying with ASTM D 3909 installed over the combustible decking. However, openings on barrel tiles or similar roof coverings, must be fire stopped (bird stopped) with approved materials to prevent the accumulation of debris, bird nests, etc. between the tiles and decking material.
3. When provided, exposed valley flashings shall be not less than 0.019-inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of minimum 72 pound mineral-surfaced non-perforated cap sheet complying with ASTM D 3909 running the full length of the valley.
4. All rain gutters, down spouts and gutter hardware shall be constructed from metal or other non-combustible material to prevent wildfire ignition along eave assemblies.
5. All chimney, flue or stovepipe openings attached to a fireplace, stove, or other solid or liquid fuel burning equipment or device shall be equipped with an approved spark arrester. An approved spark arrester is defined as a device intended to prevent sparks from escaping into the atmosphere and constructed of nonflammable materials, having a 12-gauge minimum thicknesses with openings no greater than ½ inch, or other alternative material the Fontana Fire Protection District determines to provide equal or better protection. It shall be installed to be visible for the purposes of inspection and maintenance.
6. The exterior surface materials shall be non-combustible, including hard or ignition resistant, such as stucco. In all construction, 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.
7. All eaves, fascias, 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 4"x 6" rafter tails.
8. Paper-faced insulation shall be prohibited in attics or ventilated spaces.
9. Automatic interior fire sprinklers for commercial buildings shall be installed according to the National Fire Protection Association (NFPA) 13 requirements.
10. Roof vents, dormer vents, gable vents, foundation ventilation openings, ventilation openings in vertical walls, or other similar ventilation openings shall be louvered and covered with 1/16-inch, noncombustible, corrosion-resistant metal mesh or other approved material that offers equivalent protection.

11. Attic or foundation ventilation louvers or ventilation openings in vertical walls shall not exceed 144 square inches per opening and shall be covered with 1/16" inch mesh corrosion-resistant metal screen or other approved material that offers equivalent protection. Ventilation louvers and openings may be incorporated as part of access assemblies.
12. No attic ventilation openings or ventilation louvers shall be permitted in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas.
13. All fences and gate assemblies (fences, gates, and fence posts) attached or within five feet of a structure shall be of non-combustible material or pressure-treated exterior fire-retardant wood.
14. 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, pressure-treated exterior fire- retardant wood or ignition resistant construction. 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.
15. Accessory structures attached to buildings with habitable spaces and projections shall be in accordance with Chapter 7A of the CBC.
16. Detached accessory structures located less than 50 feet from a building containing habitable space shall be constructed in accordance with Chapter 7A of the CBC.
    - ***Exception:*** *Accessory structures less than 120 square feet in floor area located at least 30 feet from a building containing a habitable space.*
17. Exterior doors shall be approved non-combustible construction, solid core wood and shall conform to the performance requirements of standard SFM 12-7A-1 or shall be of approved noncombustible construction, or solid core wood having stiles and rails not less than 1⅜ inches thick with interior field panel thickness no less than 1¼ inches thick, or shall have a fire-resistance rating of not less than 20 minutes when tested according to National Fire Protection Association (NFPA) 252.
18. All glass or other transparent, translucent or opaque glazing materials, that is used in exterior windows, including skylights, or exterior glazed door assemblies shall be constructed of multipane glazing with one tempered pane meeting the requirements of Section 2406 (2016 CBC) Safety Glazing.
19. Vinyl window assemblies are deemed acceptable if the windows have the following characteristics:
    - Frame and sash are comprised of vinyl material with welded corners
    - Metal reinforcements in the interlock area
    - Glazed with insulating glass, annealed or tempered (one layer of which must be tempered glass).
    - Frame and sash profiles are certified in AAMA Lineal Certification Program.
    - Certified and labeled to ANSI/AAMA/NWWDA 101/LS2-97 for Structural Requirements.

Appendix E

Proposed Project Fuel Modification Plan



SOURCE: AERIAL-BING MAPPING SERVICE

DUDEK

0 75 150 Feet

APPENDIX E

Proposed Project Fuel Modification Plan

Fire Protection Plan for the Whitewood 29 Project

Appendix F

Prohibited Plant List

Botanical Name	Common Name	Comment*
Trees		
Abies species	Fir	F
Agonis juniperina	Juniper Myrtle	F
Casuarina cunninghamiana	River She-Oak	F
Chamaecyparis species (numerous)	False Cypress	F
Cryptomeria japonica	Japanese Cryptomeria	F
Cupressocyparis leylandii	Leyland Cypress	F
Cupressus species *(C. fobesii, C. glabra, C. sempervirens,)*	Cypress (Tecate, Arizona, Italian, others)	F
Eucalyptus species (numerous)	Eucalyptus	F, I
Juniperus species (numerous)	Juniper	F
Lithocarpus densiflorus	Tan Oak	F
Melaleuca species *(M. linariifolia, M. nesophila, M. quinquenervia)*	Melaleuca (Flaxleaf, Pink, Cajeput Tree)	F, I
Picea (numerous)	Spruce	F
Palm species (numerous)	Palm	F, I
Pinus species *(P. brutia, P. canariensis, P. b. eldarica, P. halepensis, P. pinea, P. radiata, numerous others)*	Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)	F
Platycladus orientalis	Oriental arborvitae	F
Pseudotsuga menziesii	Douglas Fir	F
Tamarix species *(T. africana, T. aphylla, T. chinensis, T. parviflora)*	Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)	F, I
Taxodium species *(T. ascendens, T. distichum, T. mucronatum)*	Cypress (Pond, Bald, Monarch, Montezuma)	F
Taxus species *(T. baccata, T. brevifolia, T. cuspidata)*	Yew (English, Western, Japanese)	F
Thuja species *(T. occidentalis, T. plicata)*	Arborvitae/Red Cedar	F
Groundcovers, Shrubs and Vines		
Acacia species	Acacia	F, I
Adenostoma fasciculatum	Chamise	F
Adenostoma sparsifolium	Red Shanks	F
Agropyron repens	Quackgrass	F, I
Anthemis cotula	Mayweed	F, I
Arctostaphylos species	Manzanita	F
Arundo donax	Giant Reed	F, I
Artemisia species *(A. abrotanium, A. absinthium, A. californica, A. caucasica, A. dracunculus, A. tridentata, A. pynocephala)*	Sagebrush (Southernwood, Wormwood, California, Silver, True tarragon, Big, Sandhill)	F
Atriplex species (numerous)	Saltbush	F, I
Avena fatua	Wild Oat	F
Baccharis pilularis	Coyote Bush	F
Bambusa species	Bamboo	F, I

Botanical Name	Common Name	Comment*
Bougainvillea species	Bougainvillea	F, I
Brassica species *(B. campestris, B. nigra, B. rapa)*	Mustard (Field, Black, Yellow)	F, I
Bromus rubens	Foxtail, Red brome	F, I
Castanopsis chrysophylla	Giant Chinquapin	F
Cardaria draba	Hoary Cress	I
Cirsium vulgare	Wild Artichoke	F,I
Conyza bonariensis	Horseweed	F
Coprosma pumila	Prostrate Coprosma	F
Cortaderia selloana	Pampas Grass	F, I
Cytisus scoparius	Scotch Broom	F, I
Eriogonum species *(E. fasciculatum)*	Buckwheat (California)	F
Fremontodendron species	Flannel Bush	F
Heterotheca grandiflora	Telegraph Plant	F
Hordeum leporinum	Wild barley	F, I
Juniperus species	Juniper	F
Lactuca serriola	Prickly Lettuce	I
Larrea tridentata	Creosote bush	F
Lolium multiflorum	Ryegrass	F, I
Lonicera japonica	Japanese Honeysuckle	F
Mimulus aurantiacus	Sticky Monkeyflower	F
Miscanthus species	Eulalie Grass	F
Muhlenbergia species	Deer Grass	F
Nicotiana species *(N. bigelovii, N. glauca)*	Tobacco (Indian, Tree)	F, I
Pennisetum setaceum	Fountain Grass	F, I
Perovskia atroplicifolia	Russian Sage	F
Phoradendron species	Mistletoe	F
Pickeringia montana	Chaparral Pea	F
Rhus (R. diversiloba, R. laurina, R. lentii)	Sumac (Poison oak, Laurel, Pink Flowering)	F
Ricinus communis	Castor Bean	F, I
Rhus Lentii	Pink Flowering Sumac	F
Salvia species (numerous)	Sage	F, I
Salsola australis	Russian Thistle	F, I
Solanum Xantii	Purple Nightshade (toxic)	I
Silybum marianum	Milk Thistle	F, I
Thuja species	Arborvitae	F
Urtica urens	Burning Nettle	F

*F = flammable, I = Invasive

Notes:

1. Plants on this list that are considered invasive are a partial list of commonly found plants. There are many other plants considered invasive that should not be planted in a fuel modification zone and they can be found on The California Invasive Plant Council's Website www.cal-ipc.org/ip/inventory/index.php. Other plants not considered invasive at this time may be determined to be invasive after further study.

2. For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
3. The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
4. All vegetation used in Fuel Modification Zones and elsewhere in this development shall be subject to approval of the Fire Code Official.
5. Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

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