

**OTAY RANCH
VILLAGE 14 AND PLANNING
AREAS 16/19
FIRE PROTECTION PLAN**
Record ID: PDS2016-SP-16-002
Environmental Log No. PDS2016-ER-16-19-006

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FEBRUARY 2018

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
CSA	County Service Area
DPW	San Diego County Department of Public Works
FMZ	fuel modification zone
FPP	Fire Protection Plan
GDP	General Development Plan
HOA	Homeowner's Association
LBZ	limited building zone
LDA	Limited Development Area
MSCP	Multiple Species Conservation Program
NFPA	National Fire Protection Association
RMP	Resource Management Plan
SDCFA	San Diego County Fire Authority
SRP	Subregional Plan
WFEP	Wildland Fire Evacuation Plan
WUI	wildland/urban interface

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EXECUTIVE SUMMARY

This Fire Protection Plan (FPP) is for Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project), as referred to in the Otay Ranch General Development Plan/Subregional Plan (Otay Ranch GDP/SRP), in San Diego County. This FPP provides measures for fire protection that meet the 2017 San Diego County Consolidated Fire Code. The Proposed Project would be required to meet the adopted codes at the time of construction. This FPP also identifies the fire risk associated with the Proposed Project's planned land uses, and identifies requirements for fuel modification, building design and construction, and other pertinent development infrastructure criteria for fire protection. The primary focus of this FPP is to provide an implementable framework for suitable protection of the planned structures and the people living there. Tasks completed in preparation of this FPP include data review, code review, site fire risk analysis, land use plan review, fire behavior modeling, and site-specific recommendations.

Where possible, this FPP incorporates principles of sustainability, which are an important component of the Proposed Project. Preservation and conservation of resources, including energy, water, and native plant communities within the Otay Ranch Resource Management Plan (RMP)/Multiple Species Conservation Program (MSCP) Preserve, is an important component of the Proposed Project and has been duly considered and integrated into this FPP where it does not lessen fire protection.

The Proposed Project is located in southwestern San Diego County between the City of Chula Vista and the community of Jamul. The applicant-owned area totals approximately 1,283.5 acres within Village 14 (723.7 acres) and Planning Areas 16/19 (559.8 acres). The Project Area also includes 85.4 acres of off-site development, primarily for Proctor Valley Road improvements, for a total of approximately 1,369 acres.

A portion of the Project Area is proposed for the development of a master-planned, residential community. At build-out, the Proposed Project would include residential areas, a school site, a public safety site, a commercial area, and circulation elements. Within the Development Footprint, there would also be parks and recreation facilities. A total of 427.1 acres within the Project Area would be conveyed to the Otay Ranch RMP/MSCP Preserve. Approximately 536.7 acres are designated to Preserve and managed open space and parks (345.7 acres in Village 14 and an additional 191.0 acres in Planning Areas 16/19).¹

¹ Additional off-site Otay Ranch RMP Preserve would be conveyed to meet the 1.188 RMP Preserve Conveyance Obligation.

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The Proposed Project would be built in five phases (North Village 14, Central Village 14, and South Village 14 phases, and Planning Areas 16/19 phases) and would include single-family and multifamily residential; mixed-use; retail/commercial; a public safety site; an elementary school site; park and recreation facilities; and related water, sewer, electrical, and roadway infrastructure necessary within a planned community.

Fire service would be provided by the San Diego County Fire Authority (SDCFA) from a centrally located station capable of responding to 96% of the Proposed Project's lots, including all lots within the Village Core and limited semi-rural residential areas within the County of San Diego's General Plan 5-minute travel time standard. Existing Station 36 can respond to a portion of the remaining 4% of the lots within 5 minutes' travel, and the remaining lots within 6 minutes, well below the 10-minute travel time standard for the larger lot, semi-rural residential areas. SDCFA would serve the Proposed Project because it is located within its jurisdiction, and the County has indicated it can and would provide fire and emergency medical response. The other fire agency in the area is the Chula Vista Fire Department, but the Proposed Project is not within its jurisdictional area, and neither of the two closest Chula Vista Fire Department fire stations can provide service to any of the proposed structures within the County of San Diego General Plan's 5-minute travel time standard.

The structures in the Proposed Project would be built using ignition-resistant materials pursuant to the most recent County of San Diego Fire and Building Codes (Chapter 7-A – focusing on structure ignition resistance from flame impingement and flying embers in areas designated as high fire hazard areas), which are the amended California Fire and Building Codes. This would be complemented by an improved water availability, capacity, and delivery system; Project Area firefighting resources; fire department access throughout the developed areas; monitored defensible space/fuel modification; interior, automatic fire sprinkler systems in all structures; monitored interior sprinklers in applicable structures; and other components that would provide properly equipped and maintained structures with a high level of fire ignition resistance.

The site fire risk analysis resulted in the determination that wildfire has occurred and will likely occur near the Project Area again, but the Proposed Project would provide ignition-resistant landscape and structures, and defensible space with implementation of specified safety measures. Based on modeling and analysis of the Project Area to assess its unique fire risk and fire behavior, it was determined that the California and San Diego County standard of 100-foot-wide fuel modification zones (FMZs) would be suitable to protect the Proposed Project from an anticipated wildfire that may burn in areas adjacent to developed areas. This 100-foot-wide FMZ, when properly maintained, has proven effective at minimizing structure ignition from direct flame impingement or radiant heat, especially for structures constructed using the latest

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ignition-resistant codes. The FMZs for Village 14 would be maintained in perpetuity by a funded Community Facilities District, Homeowner's Association (HOA), or similarly funded entity.

FMZs on private lots in Planning Areas 16/19 would be maintained by the property owner, but monitored and enforced by the HOA or Approved Maintenance Entity, ensuring that the required fuel reduction work occurs annually and FMZs are functional. Limited building zones (LBZs) or Limited Development Areas (LDAs) would be provided on all large lots (Planning Area 16) where adjacent to the Otay Ranch RMP/MSCP Preserve. LBZs and LDAs would ensure that appropriate buffers are available from designated open space should additional buildings be constructed on the large lots. If an accessory building is constructed adjacent to an LBZ, the LBZ can be maintained as an FMZ.

In addition to the code-required fire protection features, the Proposed Project would provide additional measures, including heat-deflecting landscape walls at strategic perimeter locations to augment the FMZs and to provide additional perimeter protection for homes with a downslope at the edge of a rear yard, as discussed in more detail in this FPP.

This FPP provides a detailed analysis of the Proposed Project, the potential risk from wildfire, and potential impacts on the SDCFA, as well as an analysis on meeting or exceeding the requirements of the County of San Diego. Further, this FPP provides requirements, recommendations, and measures to reduce the risk and potential impacts to acceptable levels, as determined by the SDCFA.

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1 INTRODUCTION

This Fire Protection Plan (FPP) was prepared for the Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project). The purpose of this FPP is to evaluate the potential impacts resulting from wildland fire hazards and identify measures necessary to adequately mitigate those risks to a level consistent with County of San Diego (County) thresholds. Additionally, this FPP generates and memorializes the fire safety requirements of the fire authority having jurisdiction, which is the San Diego County Fire Authority (SDCFA). Requirements and recommendations detailed in this FPP are based on site-specific characteristics, applicable code requirements, and input from the Proposed Project's applicant and the fire authority having jurisdiction.

As part of the assessment, this FPP includes evaluation of, among other site factors, the property location, topography (including saddles, chutes, chimneys), geology, combustible vegetation (fuel types), climatic conditions, and fire history. This FPP addresses water supply, access (including secondary access, where applicable), structural ignitability and ignition-resistive building features, fire protection systems and equipment, potential impacts to existing emergency services, defensible space, and vegetation management. It also identifies and prioritizes areas for potentially hazardous fuel reduction treatments and recommends the types and methods of treatment to protect the community and essential infrastructure. This FPP also recommends measures that property owners and the Homeowner's Association (HOA) could take to reduce the probability of structure ignition throughout the area.

The Proposed Project is located within the boundaries of the SDCFA in the unincorporated portion of the County. This FPP addresses SDCFA's and California Department of Forestry and Fire Protection's (CAL FIRE) response capabilities and response travel time within the Project Area, along with projected funding for facility improvements and fire service maintenance.

The following tasks were performed to complete this FPP:

- Gather site specific climate, terrain, and fuel data.
- 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.

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- Collect site photographs and map fuel conditions using 200-scale aerial images. Field observations were used to augment existing digital site data in generating the fire behavior models and formulating the recommendations presented in this FPP. Refer to Appendix A for site photographs of existing site conditions.
- Evaluate nearby firefighting and emergency medical resources.
- Prepare this FPP detailing how fire risk would be mitigated through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades.

1.1 Intent

The intent of this FPP is to provide fire planning guidance and requirements for reducing fire risk and demand for fire protection services associated with the Proposed Project. To that end, the fire protection “system” detailed in this FPP includes redundant layering of measures, including pre-planning, fire prevention, fire protection, passive and active suppression, and related measures proven to reduce fire risk. The fire protection system planned for the Proposed Project has proven, through real-life wildfire encroachment examples throughout Southern California, to reduce the fire risk associated with this type of residential community.

1.2 Applicable Codes/Existing Regulations

This FPP demonstrates that the Proposed Project would comply with applicable portions of the 2017 Consolidated Fire Code or the most current fire and building codes at the time of tentative map approval. The Proposed Project also would be consistent with the 2016 California Building Code, Chapter 7-A; the 2016 California Fire Code, Chapter 49; and the 2016 California Residential Code, Section 237 as adopted by San Diego County. Chapter 7-A of the California Building Code addresses reducing ember penetration into homes, a leading cause of structure loss from wildfires (California Building Standards Commission 2016). Thus, code compliance is an important component of the requirements of this FPP, given the Proposed Project’s wildland/urban interface (WUI) location that is within an area statutorily designated as a Very High Fire Hazard Severity Zone by CAL FIRE (FRAP 2015). Fire hazard designations are based on topography, vegetation, and weather, among other factors with more hazardous sites, including steep terrain, unmaintained fuels/vegetation, and WUI locations. Projects situated in Very High Fire Hazard Severity Zones require fire hazard analysis and application of fire protection measures to create defensible communities within these WUI locations. As described in this FPP, the Proposed Project would meet applicable code requirements for building in these higher fire hazard areas, or meet the intent of the code through the application of site-specific fire protection measures. This is applicable for potential accessory structures in Planning Areas 16/19

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and a limited number of lots where less than 100 feet of fuel modification zones (FMZs) is proposed. These codes have been developed through decades of wildfire structure save and loss evaluations to determine the 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 2016 California Building Code (Chapter 7-A, Section 701A Scope, Purpose, and Application) (California Building Standards Commission 2016).

1.3 Proposed Project Summary

1.3.1 Location

The Project Area encompasses approximately 1,283.6 acres and is located in Otay Ranch Village 14 and Planning Areas 16/19, within the Proctor Valley parcel of the Otay Ranch General Development Plan/Otay Subregional Plan (GDP/SRP) area in southwestern San Diego County. The total Project Area includes approximately 85.4 acres of off-site improvements, primarily associated with proposed Proctor Valley Road improvements, for a total Project Area of 1,369 acres. The Project Area is located approximately 0.25 miles east of the City of Chula Vista and 1.8 miles southwest of the unincorporated community of Jamul (Figure 1, Regional Map).

Additionally, the Project Area is located northeast of Upper Otay Reservoir and is bordered by open space to the northwest and southeast. More specifically, the Proposed Project is located to the northwest and southeast of Proctor Valley Road, within the northern half of Section 30, eastern half of Section 19, western half of Section 20, and southwest quarter of Section 17 of the Jamul Mountains U.S. Geological Survey 7.5-minute quadrangle, Township 17 South, Range 1 East.

Regional access to Otay Ranch Village 14 is provided by State Route (SR) 125, located approximately 3 miles to the west. Interstate (I) 805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805 and provides regional east/west access. SR-94 is approximately 2 miles to the east and provides north/south travel.

Proctor Valley Road would provide the main access to the Proposed Project. Four roundabouts in Village 14 and one roundabout in Planning Areas 16/19 would identify the entrance into each residential area, and provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods; with Planning Areas 16/19 designed to County Rural Road Standards. A secondary access to the easternmost portion of Planning Area 16 is the planned extension of existing Whispering Meadows Road.

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Proctor Valley Road is an existing rural improved two-lane road and is designated as a scenic corridor. The northern connection of Otay Ranch Village 14 to Jamul would remain substantially in the alignment of the existing partially improved Proctor Valley Road and would provide both public and emergency services access to both communities.

1.3.2 Vicinity Land Use

Existing land uses surrounding the Proposed Project vary from highly urbanized areas to open space lands (Figure 2, Vicinity Map). Development is primarily concentrated around Rancho San Diego to the north and the rural community of Jamul to the northeast. Existing development, including the East Lake Vistas, Rolling Hills Ranch, and Bella Lago residential communities is located to the southwest of the Project Area. Upper and Lower Otay Reservoirs and the proposed Resort Village (Village 13) are located to the south and southeast of the Project Area. Jamul is composed of primarily large-lot estates, horse ranches, and agriculture.

Most of the land in the vicinity of the Proposed Project to the west and east is undeveloped; some of this land consists of gently rolling hills used for agriculture and grazing and some is more rugged, steep open space. The San Diego National Wildlife Refuge is located to the west of the Proctor Valley Parcel. The Refuge stretches from Jamul to communities in Spring Valley and eastern Chula Vista. The Bureau of Land Management manages two separate parcels within the northern portion of the Proctor Valley Parcel of Otay Ranch. The large northern out parcel encompasses the Callahan Mountain Peak and some of the tops of side-slopes extending down from the peak. City of San Diego's Multiple Species Conservation Program (MSCP) "Cornerstone Lands" are located adjacent to the Project Area to the south.

1.3.3 Proposed Project Description

1.3.3.1 Overview and Background

The Proposed Project (defined below) would be part of the overall Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas. The Proposed Project addressed by this technical report would be located within a portion of Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley area of Otay Ranch, as shown in Figure 1.



SOURCE: Hunsaker 2017

FIGURE 1
Regional Map

Otay Ranch Village 14 and Planning Areas 16/19

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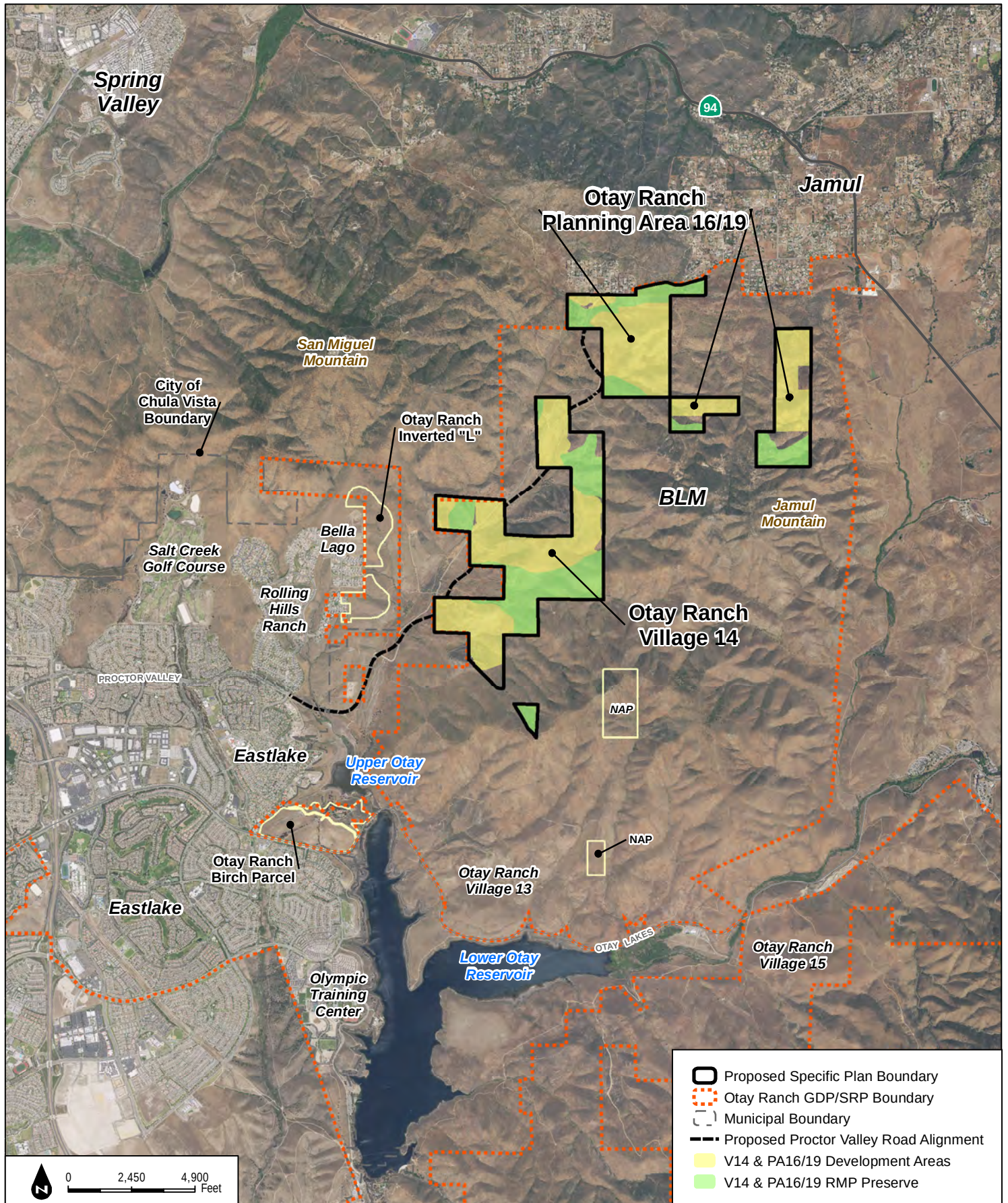


FIGURE 2
Vicinity Map

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The underlying purpose of the Proposed Project is to implement the adopted Otay Ranch GDP/SRP, Volume II (County of San Diego 1993), and complete the planned development within Jackson Pendo Development Company's (applicant) ownership of Village 14 and Planning Areas 16/19. The Otay Ranch GDP/SRP is a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19. The Proposed Project's 1,119 homes represent a portion of the total 2,123 homes originally authorized in the Otay Ranch GDP/SRP.

The Proposed Project is designed to be consistent with the Otay Ranch GDP/SRP's Village Character Policy "to serve as a transitional area between urban densities to the west and Jamul to the east." The Proposed Project is, therefore, designed to provide a transitional village between the densities and character of eastern Chula Vista and the more rural community of Jamul. The Proposed Project proposes 1,119 homes, 994 of which would be in Village 14 and 125 homes in Planning Areas 16/19, as shown in Table 1, Village 14 and Planning Areas 16/19 Site Utilization Plan Summary.

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Table 1
Village 14 and Planning Areas 16/19 Site Utilization Plan Summary

Description	Village 14		Planning Areas 16/19		Total Proposed Project	
	Gross	Target	Gross	Target	Gross	Target
	Acres ^{a,b}	Units ^c	Acres ^{d,e}	Units	Acres	Units
<i>Residential Subtotal</i>	344.2	897.0	363.6	125	707.7	1,022
Residential Use on School Site (9.7 acres) ^c	—	97	—	—	—	97
<i>Non-Residential Uses</i>						
Mixed Use ^f	1.7	—	—	—	1.7	—
Public Parks	13.8	—	1.4	—	15.2	—
Private Parks/Recreation ^b	4.5	—	—	—	4.5	—
Public Safety Site	2.3	—	—	—	2.3	—
Elementary School Site ^c	9.7	—	—	—	9.7	—
Open Space	27.6	—	2.1	—	29.7	—
Conserved Open Space	36.9	—	35.5	—	72.4	—
Otay Ranch Resource Management Plan (RMP) / MSCP Preserve	270.2	—	156.5	—	426.7	—
Circulation	12.7	—	0.8	—	13.8	—
<i>Non-Residential Uses Subtotal</i>	379.5	—	196.3	—	575.8	—
Total Proposed Project^g	723.7	994	559.8	125	1,283.5	1,119

^a Residential gross acres in Village 14 includes 96.0 acres of related internal slopes, fuel modification, and/or Preserve edge.

^b Village 14 has 5.0 acres of private pocket parks (PPP) included in the residential acreage; therefore, the subtotal, including PPPs, is 9.5 acres.

^c Units allocated to school site at 10 dwelling unit per acre per the Otay Ranch GDP/SRP policies. Should school site not be needed, 97 units may be built. Should the school site be needed, the total target units is 897 in Village 14 and 1,022 total.

^d Residential gross acres in Planning Areas 16/19 includes 14.1 acres of related private lift and pump stations.

^e Residential gross acres in Planning Areas 16/19 includes 127.1 acres of Limited Development Area (LDA).

^f Village 14 mixed-use acreage includes 10,000 square feet of commercial use.

^g 85.4 acres of off-site impacts are in excluded from the acreage in Table 1.

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1.3.4 Definitions

The following describes the major components and characteristics of the Proposed Project.

County. The “County” is the County of San Diego jurisdiction.

“Project Area” Defined: The “Project Area” is the applicant’s ownership within Otay Ranch Village 14 and Planning Areas 16/19 in addition to certain off-site areas for infrastructure as depicted in Figure 1. The Project Area covers approximately 1,283.6 acres owned by the applicant and approximately 85.4 acres of off-site improvements, described below, for a total of 1,369 acres.

Study Area. The “Study Area” includes the Project Area as well as areas beyond the Project Area within the region that influence fire behavior and fire spread.

Proposed Project. The Proposed Project is the applicant’s ownership as depicted in Figure 1. The specific plan for the Proposed Project is titled “Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan.” The Proposed Project includes a Specific Plan, General Plan Amendments, an environmental impact report (EIR), a rezone, a Tentative Map, and an Otay Ranch Resource Management Plan (RMP) Amendment. The Proposed Project is further defined in Chapter 1, Project Description, of the EIR, which is incorporated herein by reference. Except for the off-site areas described below, the Proposed Project specifically excludes California’s ownership in Village 14 and Planning Area 16, which remains approved for development per the County’s General Plan and the Otay Ranch GDP/SRP. The underlying County General Plan and Otay Ranch GDP/SRP land uses on the state’s property would remain unchanged. In addition, the “Inverted L” is excluded from this analysis as it is not owned by the applicant and is in the City of Chula Vista, (the property is owned by Otay Water District and the U.S. Fish and Wildlife Service).

Otay Ranch Village 14. “Otay Ranch Village 14” or “Village 14” as referred to herein is a discrete subset of the Proposed Project and reflects approximately 723.7 acres of the applicant’s ownership located exclusively within Village 14 as depicted in Figure 2. Approximately 994 homes are planned around a Village Core in this area, as shown in Table 1.

Otay Ranch Planning Areas 16/19. “Otay Ranch Planning Areas 16/19” or “Planning Areas 16/19” is a discrete subset of the Proposed Project and reflects approximately 559.8 acres of the applicant’s ownership located exclusively within Planning Areas 16/19 as depicted in Figure 2. Approximately 125 homes are planned on 1-acre and 3-acre-average lots in this area, as shown in Table 1. Further described below, the Limited Development Area would be 127.1 acres.

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Limited Development Area. Limited Development Area (LDA) is a defined land use designation in the Otay Ranch GDP/SRP. “An open space easement will cover the areas designated as ‘Limited Development Area’...These areas will be left as natural open space with the exception that roads and utilities are anticipated to cross or lie within these areas...LDAs may be included within private lots but would have the following set of restrictions. Removal of native vegetation would be prohibited except as necessary for construction of roads and utilities. There would be no buildings or other structure, agriculture, landscaping, livestock, grazing, horses, trash disposal of fences allowed within these areas.” Fuel modification is allowed in the LDA as “brushing for fire control zones would conform to the local fire district regulations.” A total of 127.1 acres of LDA would be provided in Planning Areas 16/19. There is no LDA in Village 14.

Otay Ranch RMP and Multiple Species Conservation Program (MSCP) Preserve. The Otay Ranch Resource Management Plan (RMP) provides for the conservation, funding and management of the entire 11,375-acre Otay Ranch RMP Preserve. The MSCP County Subarea Plan Implementing Agreement describes the County’s required contribution to the MSCP Preserve. The Implementing Agreement states that the required mitigation for Otay Ranch includes “protection of the areas identified as preserved in the boundaries of the Otay Ranch project including approximately 11,375 acres” of the Otay Ranch RMP Preserve. Therefore, the Otay Ranch RMP Preserve is a subset of the MSCP Preserve.

The portion of the Proposed Project’s land use designated as Otay Ranch RMP Preserve, while considered a part of the MSCP County Subarea Plan Preserve, is unique to Otay Ranch because it specifically mitigates for direct and cumulative impacts associated with implementation of the Otay Ranch GDP/SRP. The Proposed Project includes 426.7 acres of Otay Ranch RMP Preserve, of which 270.2 acres are in Village 14 and 156.5 acres are in Planning Areas 16/19.

Preserve Conveyance Obligation. To satisfy assemblage of the 11,375-acre Otay Ranch RMP Preserve ranch wide, a “Preserve Conveyance Obligation” was prescribed in the Otay Ranch RMP. The Preserve Conveyance Obligation is 1.188 acres of Otay Ranch RMP Preserve conveyed per 1 acre of development, as further defined in the adopted Otay Ranch RMP. This obligation, which is the primary basis of Proposed Project’s required mitigation, may be achieved through conveyance of either the applicant’s RMP Preserve ownership or through off-site acquisition within the 11,375 acres Otay Ranch RMP Preserve.

Conserved Open Space. “Conserved Open Space” refers to those areas with an Otay Ranch GDP/SRP land use designation other than Otay Ranch RMP Preserve that will be preserved on site and which will either be added to the Otay Ranch RMP Preserve (through a future RMP Amendment), managed under a separate Resource Management Plan, or utilized to mitigate

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impacts to the City of San Diego MSCP Cornerstone Lands.. The approximately 72.4 acres of Conserved Open Space is composed of 31.9 acres within the 127.1 acres of LDA and 3.6 acres of residential land use designation in Planning Area 16/19 plus 36.9 acres of residential land use designation within Village 14. The Conserved Open Space areas are located adjacent to Otay Ranch RMP Preserve and will be conserved by recording a biological open space easement over the land.

Development Footprint. The Development Footprint includes areas where there would either be permanent or temporary ground disturbance. The Development Footprint includes all on-site development, off-site improvements, graded LDA, and impacts resulting from infrastructure and other allowable uses within the Otay Ranch RMP/MSCP Preserve, per Section 1.9.3 of the MSCP County Subarea Plan (County of San Diego 1997).

Off-Site Improvements. “Off-site improvements” total approximately 85.4 acres of both temporary and permanent impacts, and include the following: Proctor Valley Road, including related wet and dry utilities, drainage facilities and trails; access roads in Planning Area 16; an off-site sewer pump station in the southern reach of Proctor Valley Road and off-site sewer facilities to connect to the Salt Creek Interceptor as planned since 1994.

Proctor Valley Road improvements would include South Proctor Valley Road (0.25 miles in the City of Chula Vista land and 0.2 acres privately owned in the County); South and Central Proctor Valley Road (1.5 miles in City of San Diego Cornerstone land); Central Proctor Valley Road (0.4 miles in CDFW Otay Ranch Village 14 land); and North Proctor Valley Road (0.75 miles in CDFW Otay Ranch land between Village 14 and Planning Areas 16/19).

Proctor Valley Road Central and South are proposed to be improved and classified as a two-lane-with-median light collector with a width ranging from 68 to 74 feet, plus an additional 20-foot-wide fuel modification/construction easement on each side. Proctor Valley Road north is a two-lane interim road with a paved width of 28 feet in a 40-foot-wide right-of-way. Improvements in Proctor Valley Road would include those typically in roadways, including wet and dry utilities, a sewer pump station, drainage, landscape, culverts, and trails. Proctor Valley Road is an approved County General Plan mobility element road and an approved facility in the MSCP County Subarea Plan.

In addition, there are three public off-site roads within Planning Area 16. These roads are located primarily within CDFW managed lands and are approved in the Otay Ranch GDP/SRP as facilities within designated development or LDA land use, (and are also approved facilities per the MSCP County Subarea Plan Section 1.9.3.3 (County of San Diego 1997)).

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Improvements in these off-site roads would include those typically in roadways, including wet and dry utilities, drainage, landscape, culverts, and trails.

1.4 Proposed Specific Plan

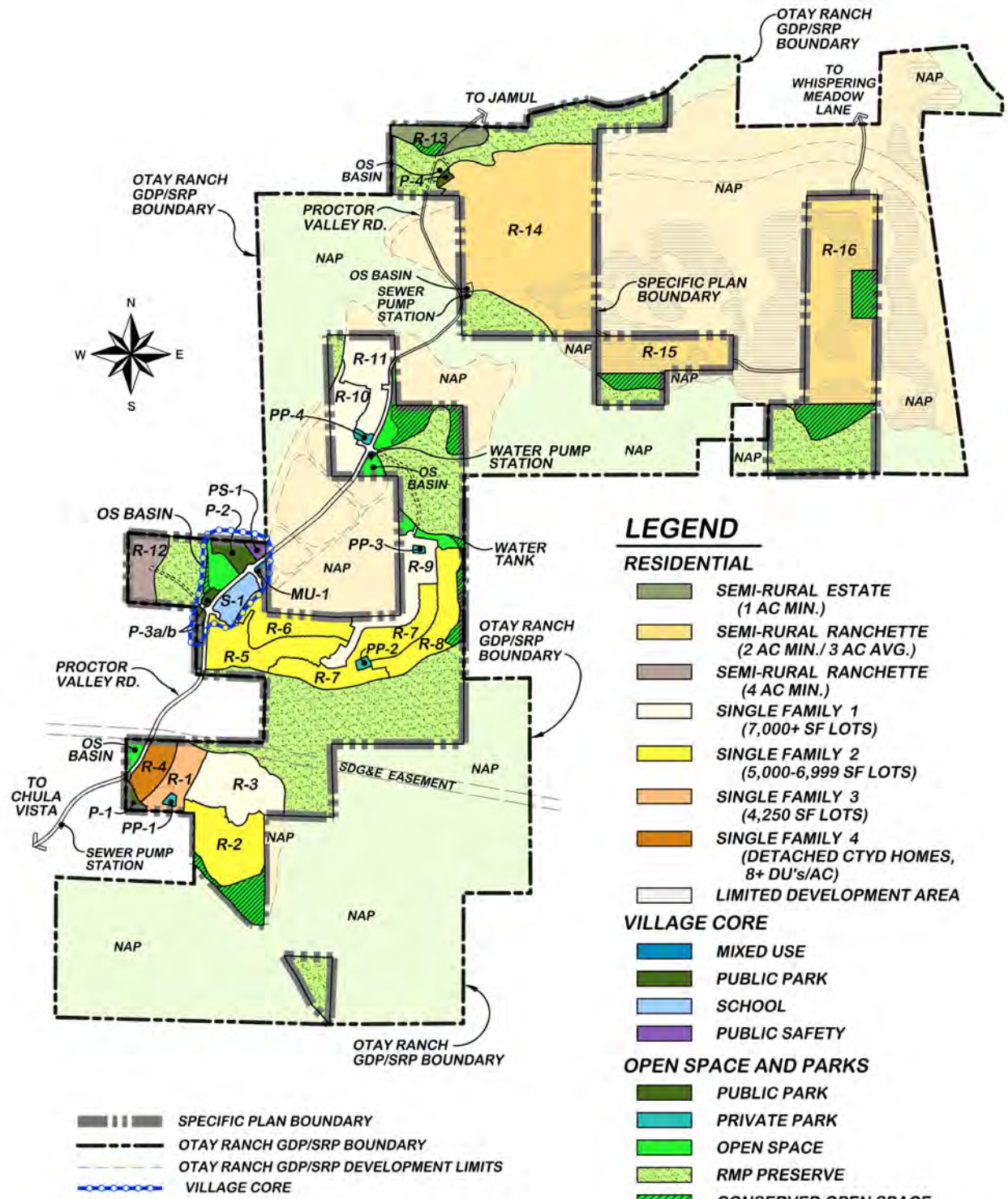
1.4.1 Summary

The adopted Otay Ranch GDP/SRP requires the preparation of a Specific Plan, which includes a Site Utilization Plan to describe the land uses for the Proposed Project. Figure 3 depicts the proposed Site Utilization Plan.

Approximately 994 homes are planned in Village 14, set in three distinct areas (referred to herein as the South, Central, and North Village 14) 878 of which would be single-family homes located in gated enclaves and 116 would be detached courtyard homes clustered around a common driveway. Twelve neighborhoods are planned with approximate densities ranging from 0.2 to 10.0 dwelling units per acre. Otay Ranch Village 14 is planned around a “Village Core”, centrally located in the heart of the village. The Village Core would be composed of a 9.7-acre elementary school, a 7.2-acre Village Green (public park), a 1.7-acre mixed-use site with up to 10,000 square feet of commercial/retail uses, and a 2.3-acre public safety site for a fire station and satellite sheriff’s facility. Additional public and private parks, swim clubs, trails, and recreational facilities would be situated throughout South, Central, and North Village 14. See Table 1 for detailed land uses in Village 14.

In addition to the homes in Village 14, there are 13 one-acre average sized estate lots proposed in Planning Area 19 and 112 three-acre average sized ranchettes in Planning Area 16. Planning Areas 16/19 neighborhoods would not be gated neighborhoods. The LDA may include public infrastructure, and/or be conserved within private lots with a conservation easement. See Table 1 for detailed land uses in Planning Areas 16/19.

The Proposed Project’s Specific Plan is designed around an active lifestyle and wellness recreation theme and includes a park and recreation system including four public parks totaling approximately 15.2 acres. The remaining private recreation facilities include three private swim clubs, and numerous pocket parks totaling approximately 9.5 acres. An approximately 4.5 mile, 10-foot-wide decomposed granite Community Pathway is proposed along Proctor Valley Road from Chula Vista to Jamul. The Proposed Project includes approximately 27.6 acres of open space (exclusive of the 110.1 acres of open space included in the residential gross acres), 127.1 acres of LDA, and 426.7 acres of Otay Ranch RMP Preserve within the applicant’s ownership. Of note, there is approximately 72.4 acres of Conserved Open Space within the Proposed Project that will be conserved by recording a biological open space easement.



SOURCE: Hunsaker 2018

FIGURE 3
Proctor Valley Site Utilization Plan

OTAY RANCH VILLAGE 14 AND PLANNING AREAS 16/19

Otay Ranch Village 14 and Planning Areas 16/19 Fire Protection Plan

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1.4.2 Circulation and Access

Regional access to Otay Ranch Village 14 is provided by SR-125, located approximately 3 miles to the west. Interstate (I) 805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. SR-94, located approximately 3 miles to the northeast, provides access from the east through the Jamul community.

Proctor Valley Road would provide the main access to the Proposed Project. Four roundabouts in Village 14 and one roundabout in Planning Areas 16/19 would identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods; with Planning Areas 16/19 designed to County Rural Road Standards. A secondary access to the easternmost portion of Planning Area 16 is the planned extension of existing Whispering Meadows Lane.

Proctor Valley Road is planned as a two-lane mobility element road and is designated as a scenic corridor. The northern connection of Otay Ranch Village 14 to the community of Jamul would remain substantially in the alignment of the existing partially improved Proctor Valley Road and would be paved to provide both public and emergency access for the Proposed Project as well as for the community of Jamul.

1.4.3 Public Services

An overview of public services is provided as follows:

Sewer: Capacity would be provided by the County through annexation into the County Sanitation District. Sewer transportation would be provided by conveying flows to the City of Chula's Salt Creek Interceptor pursuant to agreements between the City and County. Sewer would be provided in Village 14 and Planning Areas 16/19 per the Otay Ranch GDP/SRP and adopted sewer agreements. The Proposed Project includes sewer trunk line extensions and pump, or lift stations.

Water: The Proposed Project is located within the Otay Water District boundary and is already accommodated in the Otay Water District Water Resources Master Plan. A 980-pressure zone water tank adjacent to Central Village 14 is planned on site. The Proposed Project includes water transmission lines, a 980 reservoir and pump stations.

Law Enforcement: County Sheriff's office would provide law enforcement services and have a storefront facility co-located with the fire station at the public safety site in the Village Core.

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Fire: Fire service would be provided by SDCFA from a fire station built within the Proposed Project's public safety site in the Village Core.

Stormwater/Drainage: Biofiltration basins are planned to handle the Proposed Project runoff and treat stormwater and site drainage prior to discharging into the natural drainages.

Schools: Village 14 is planned to be served by the Chula Vista Elementary School District and Sweetwater Union High School District. Planning Areas 16/19 are planned to be served by the Jamul/Dulzura Union School District and the Grossmont High School District as prescribed in the adopted Otay Ranch GDP/SRP Facilities Implementation Plan and consistent with County Board of Supervisors Policy I-109, Policy II.

1.5 Proctor Valley Road North and Trails Options

The Proposed Project includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option, and (3) the Perimeter Trail Option. The Draft EIR assesses each of these options and their respective impacts. This would allow the County Board of Supervisors to select the option (or combination of options) it considers best for the Proposed Project and the environment. Each of the options is summarized below. For detailed descriptions with figures, see the Specific Plan Section VIII Internal Circulation Options (RH Consulting 2018).

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to the portion of Proctor Valley Road from Street AA in the North Village to Echo Valley Road. This option includes two dedicated bike lanes (one on each side of the road) instead of the "sharrows" (road markings that guide bicyclists to bike routes between neighborhoods and alert motorists to the presence of bicyclists within the shared travel lane) proposed in street section 10 of the Proposed Project. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 64 feet starting from the intersection of Street AA northward to the applicant's Village 14 ownership boundary; from 40 feet to 48 feet within the off-site improvement area owned by the state; and from 40 feet to 64 feet on site within the applicant's ownership north of the state's property to Echo Valley Road.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails approximately 1 mile in length within the Project Area, east of the Development Footprint. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments "A" and "B" as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52 and 49 in the County's Community Trails Master Plan (CTMP). Segment "A"/"52" is 2,350 lineal feet, located at the northern terminus of the Proctor Valley Community Pathway and extending east through the on-site Otay Ranch RMP Preserve to

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the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment “B”/”49” is 2,328 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within on-site Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are proposed.

Perimeter Trail Option: The Perimeter Trail Option is an approximately 3.6-mile perimeter trail located within the Development Footprint of South and Central Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2 to 6 feet. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 19,000 linear feet (0.7 miles) of 5- to 7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County.

Dudek has evaluated these options and determined they are not material to the information presented in this analysis because they do not effect fire protection planning.

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2 PROPOSED PROJECT STUDY AREA RISK ANALYSIS

2.1 Field Assessment

Following review of available digital Study Area information, including topography, vegetation types, fire history, and the Proposed Project's Development Footprint, Dudek fire protection planners conducted a field assessment of the Study Area on April 27, 2015. Dudek's assessment was aided by Dudek's biologists who conducted a comprehensive vegetation mapping assignment on the Study Area over the course of several weeks in 2015 and 2016 (Dudek 2017).

Among the field tasks completed were the following:

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

Study Area photographs were collected (Appendix A), and fuel conditions were mapped using aerial images. Field observations augmented existing Study Area data in generating the fire behavior models and formulating the requirements provided in this FPP.

2.2 Study Area Characteristics and Fire Environment

The following sections discuss the characteristics of the Study Area at a regional scale. Evaluating conditions at this macro-scale provides a better understanding of the regional fire environment, which represents the fuel bed for wildfires that may ignite in the vicinity of, and burn toward, the Proposed Project's planned and maintained fire buffers, landscapes, and ignition-resistant structures.

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 spread down-slope. Terrain that forms a funneling effect, such as chimneys, chutes, or saddles on the landscape can result in especially intense fire behavior. Conversely, flat terrain tends to have little effect on fire spread, resulting in fires that are driven by vegetation and wind.

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The Proposed Project's topography in its current condition is diverse and characterized by a relatively flat valley along Proctor Valley Road and broad gentle hillsides within the remainder of the Development Area (within approximately 300 feet of the Proposed Project's Development Footprint). Areas outside this Development Footprint include steeper terrain. The Project Area is bordered by increasingly rugged terrain of the San Miguel and Jamul Mountains immediately to the northwest and southeast, respectively, with the foothills of these mountains extending into the Village 14 Project Area. These slopes are predominantly up and away from the Proposed Project's Development Footprint. Several small, narrow drainages are present along the eastern edge of the Development Footprint. A low east/west-trending ridgeline effectively divides Proctor Valley near the upper end of the proposed Study Area.

Elevations of the Study Area range from approximately 600 feet above mean sea level (amsl) at the southern end of the property to approximately 1,300 feet amsl in the northeastern portion of the Study Area in Planning Areas 16/19. Although slopes can range from 5% up to 40% within the Study Area, the Proposed Project's average slope² to approximately 300 feet outside the perimeter of the Development Footprint is approximately 19.5%. Slope is important relative to wildfire because steeper slopes typically facilitate more rapid fire spread up slope. In the case of the Study Area, the steeper slopes are primarily within the areas designated as Otay Ranch RMP/MSCP Preserve and would not be developed. The Study Area's steeper slopes ascend away from the developed areas of the Proposed Project in Village 14 (versus situations where development occurs at top of slope and the terrain descends away from the developed areas). Planning Areas 16/19 terrain includes a variety of drainages and slopes that ascend or descend from the Proposed Project's lots. The Study Area's topography is generally in alignment with the extreme Santa Ana wind events, which can influence fire spread by creating wind-driven fires, especially when moving upslope.

2.2.2 Climate

Southwestern San Diego County, including the Project Area, is influenced by the Pacific Ocean and frequently under the influence of a seasonal, migratory subtropical high-pressure cell known as the "Pacific High" (WRCC 2014a). Wet winters and dry summers with mild seasonal changes characterize the Southern California climate. Local climate, which has a large influence on fire risk, is typical of a Mediterranean area. The climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds (WRCC 2014a). The average high temperature for the Study Area during fire season is approximately 83°F, with

² The average slope within 300-foot perimeter buffer was calculated by Hunsaker and Associates using formula from San Diego County's S-1 Policy (2015).

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temperature in summer and early fall months (July–October) reaching up to 102°F. Precipitation typically occurs December through April, with annual rainfall ranging from 3.5 to 13.3 inches (2012–2014), with lower annual accumulation (3.5–5.2 inches) in 2015 due to the current drought (DWR 2015; WRCC 2014b). The prevailing wind is an on-shore flow from the Pacific Ocean, which is approximately 13 miles to the west. Hot, dry (Santa Ana) winds, which typically occur in the fall and are usually from the northeast, can gust to 50 mph or higher. The Santa Ana winds are due to the pressure gradient between high pressure in the plateaus of the Great Basin and lower pressure gradient over the Pacific Ocean (NOAA 2007). Drying vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) during the summer months becomes fuel available to advancing flames should an ignition occur. Extreme conditions, used in fire modeling for this Proposed Project, include 92°F temperatures in summer and winds of up to 50 mph during the fall. Relative humidity of 12% or less is possible during fire season.

2.2.3 Fuels (Vegetation)

The Project Area is currently undeveloped and is composed of a variety of vegetation types that were mapped by Dudek (Dudek 2017). Extensive vegetation type mapping is useful for fire planning because it enables each vegetation community to be assigned a fuel model, which is used by a software program to predict fire characteristics, as discussed in Section 4.1, Fire Behavior Modeling. The Study Area's vegetative fuels are primarily non-native grassland, chaparral, and coastal sage scrub, although smaller pockets of eucalyptus woodland, oak riparian forest, marsh, wetland, and ornamental vegetation types are present. This vegetation is adapted to periodic wildfire events. Fire history data described in Section 2.2.6, Fire History, indicates that the vegetation last burned in 2007 on the majority of the Project Area. As such, the vegetation on the property is still in early stages of recovery toward a climax species composition. Small areas of disturbed habitat and urban/developed land cover types are also present within the Study Area. More detailed information regarding the plant communities within the Study Area is provided in the Biological Resources Technical Report for the Proposed Project (Dudek 2017). Vegetation is important relative to wildfire, as some vegetation such as coastal sage scrub and grassland habitats are highly flammable, and other vegetation such as oak riparian forest is less flammable due to its higher moisture content, but will burn under certain, more intense fire conditions.

The Development Footprint would be converted to roads, structures, and landscape vegetation following the Proposed Project's completion. Any native vegetative fuels within FMZs would also be modified as a result of development, altering their current densities, distributions, and species composition. Areas that would have the most influential on development related to direct fire impacts (approximately 300 feet outside of proposed development) and FMZs would continue to be dominated by chamise-chaparral, southern mixed chaparral, Diegan coastal sage scrub, and non-native grassland fuel beds. These vegetation types were confirmed by Dudek fire

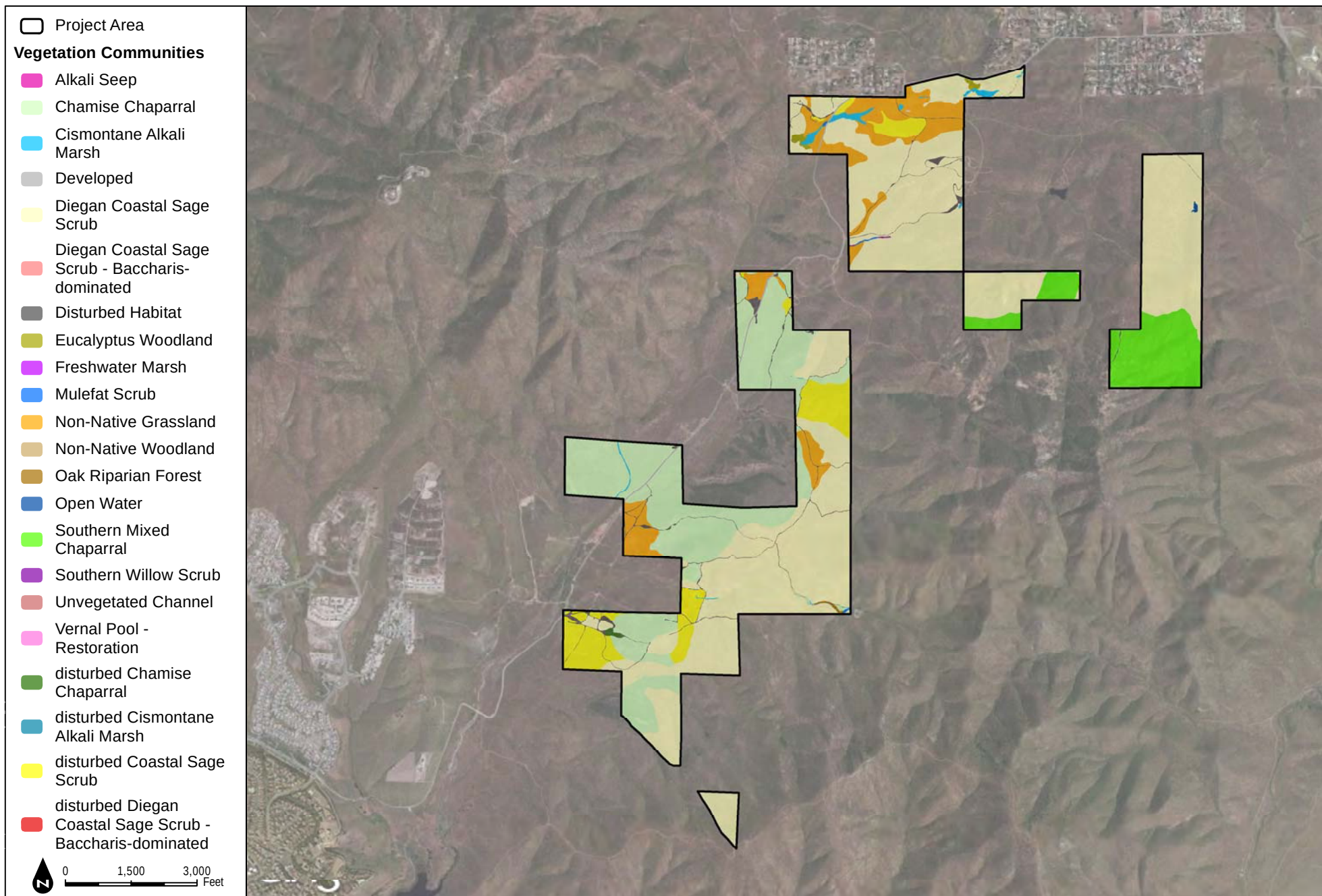
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protection planners in the field and assigned fuel models for use during fire behavior modeling (see Section 4.1.1). These fuels are anticipated to remain in the areas adjacent to the Development Footprint (just outside the FMZs) but have been planned and compensated through a system of fire protection described throughout this FPP.

2.2.4 Fuel Loads

The vegetation along the perimeter of the development and within approximately 300 feet of the FMZs is the area of highest concern for determining what effects wildfire may have on the Proposed Project's landscape and structures. It is these fuels that, if ignited, would burn up against the provided FMZs and alternative protections, designed to reduce flame length, spread, and intensity as it gets closer to the built portions of the Proposed Project. Vegetation types in these areas have been classified into fuel models used for fire behavior modeling, discussed in Section 4, Anticipated Fire Behavior, of this FPP (Figure 4, Vegetation Map). The importance of vegetative cover on fire suppression efforts is its role in affecting fire behavior. For example, although fires burning in grasslands may exhibit lower flame lengths than those burning in chaparral fuels, fire spread rates in grasslands are often much more rapid than those in other vegetation types.

Fuel loading in non-native grassland is estimated to be 0.4 tons per acre, and that in chaparral-sage scrub is estimated between 8.4 and 8.6 tons per acre (Brown 1982; Scott and Burgan 2005; Weise and Regelbrugge 1997). The fuel load is the amount of fuel available to wildfire. Shrub-dominated plant communities tend to include higher fuel loads than grass-dominated plant communities. Tree-dominated communities may include higher fuel loads than shrub-dominated landscapes. However, there are many other facets of fire behavior that govern fire ignition and spread. Therefore, because an area may include higher fuel loads, it does not necessarily mean that it presents a higher fire risk.



SOURCE: Bing Maps (Accessed in 2016), Hunsaker 2015

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FIGURE 4
Vegetation Map

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2.2.5 Vegetation Dynamics

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, the native shrub species that compose the chaparral communities in the Study Area are considered to be less likely to ignite but would exhibit higher potential hazard (higher-intensity heat and flame length) than grass-dominated plant communities (fast moving, but lower intensity) if ignition occurred. The corresponding fuel models for each of these vegetation types are designed to capture these differences. Additionally, vegetative cover influences fire suppression efforts through its effect on fire behavior. For example, although fires burning in grasslands may exhibit lower flame lengths and heat outputs than those burning in native shrub habitats, fire spread rates in grasslands are often more rapid.

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, and fire exclusion tends to convert grasslands to shrublands over time as shrubs sprout back or establish and are not disturbed by repeated fires. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, grazing) 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 FMZs. The FMZs would consist of irrigated and maintained landscapes and thinned native fuel zones that would be subject to regular “disturbance” in the form of maintenance and would not be allowed to accumulate excessive biomass over time, which results in reduced fire ignition, spread rates, and intensity.

Conditions adjacent to the Proposed Project’s footprint (outside the FMZs), where the wildfire threat would exist post-development, are currently classified as low to moderate fuel loads due to the higher percentage of grasslands intermixed with sparse stands of chamise chaparral and coastal sage scrub fuels. However, climax vegetation state (undisturbed brush stands that are not disturbed for an extended period 50 years or more) includes more uniform and dense stands of sage scrub-chaparral fuels, which were employed for a conservative modeling approach to represent worst-case (i.e., max fuels) wildfire scenarios around the perimeter of the Project Area.

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2.2.6 Fire History

Fire history is an important component of FPPs. Fire history data provides valuable information, including fire spread, fire frequency, most vulnerable areas, and significant ignition sources. 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. There have been 68 fires recorded by CAL FIRE since 1910 on their Fire and Resource Assessment Program database within 5 miles of the Proposed Project (FRAP 2015). The total of 68 fires in this area over the last 105 years within 5 miles of the Proposed Project is not considered a high number for Southern California. On average, CAL FIRE annually responds to 5,000 wildfires of more than 10 acres (CAL FIRE 2015). Of the 68 fires that have burned within 5 miles of the Proposed Project, there have been 17 fires that burned portions of the Proposed Project property. The most notable fire (Harris Fire) occurred in October 2007, and burned approximately 90,440 acres in the southwestern portion of the County, including a large portion of the Project Area. SDCFA may have data regarding other smaller, undocumented fires that have occurred on the Project Area and within the Study Area that have not been included herein because fires under 10 acres are not recorded by CAL FIRE. Appendix B, Fire History Exhibit, presents fire history within 5 miles of the Project Area and provides a graphical representation of the quantity of times the landscape has burned in the area. Recorded fires since 1910 that have burned onto the Project Area are listed in Table 2.

Table 2
Fire History in the Proposed Project Area

Fire Year ^a	Fire Name	Total Area Burned (acres)
1910	Unnamed	9,218
1911	Unnamed	32,308
1950	Wet Back	18,192
1968	Proctor	10,617
1970	Laguna	175,425
1980	Otay No. 6	13,059
1980	Proctor	9,996
1981	Proctor No. 1	2,523
1981	Proctor No. 2	413
1984	Proctor	11,604
1985	Miller	32,414
1989	Proctor No. 7	2,423
1999	Proctor	7,004
2003	Mine/Otay	46,291
2005	Proctor	204

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Table 2
Fire History in the Proposed Project Area

Fire Year ^a	Fire Name	Total Area Burned (acres)
2006	Proctor	54
2007	Harris	90,440

^a Based on polygon GIS data from CAL FIRE's Fire and Resource Assessment Program, which includes data from CAL FIRE, U.S. Department of Agriculture Forest Service Region 5, Bureau of Land Management, National Park Service, 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 1878–2013.

Based on fire history data for the vicinity, fire return intervals range between 2 and 15 years, indicating the wildfire potential in the region and the potential for the Project Area to be subject to occasional wildfire encroachment, most likely from the large expanses of open space to the north and east. Note that once the Proposed Project is built out, the fire spread patterns would be modified in this valley, as the Proposed Project would represent large fuel breaks of maintained and irrigated landscapes, which fire may encroach upon and burn around, but would not burn through the valley with the same spread patterns as it has in the past. Although the Harris Fire burned through the Project Area in 2007, the homes in Rolling Hills Ranch, San Miguel Ranch, and built portions of Bella Lago to the southwest of the Project Area were not impacted.

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3 DETERMINATION OF PROPOSED PROJECT EFFECTS

An FPP provides an evaluation of the adverse environmental effects a project may have from wildland fire. The FPP must identify mitigation for identified impacts to ensure development does not unnecessarily expose people or structures to a significant loss, injury, or death involving wildland fires. Significance is determined by answering the following guidelines:

Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildland?

The wildland fire risk in the vicinity of the Project Area has been analyzed according to San Diego County Guidelines for Determining Significance – Wildland Fire and Fire Protection (County of San Diego 2010). It has been determined that wildfires may occur in wildland areas that surround the Project Area but would not be significantly increased in frequency, duration, or size with the construction of the Proposed Project. The Proposed Project would include conversion of fuels to maintained development with designated SDCFA review of landscaping, FMZs, and highly ignition-resistant structures; a funded entity to manage and maintain the FMZ; and third-party annual FMZ inspections to confirm the FMZ areas are maintained as designed and, therefore, would function as intended. As such, the Development Footprint would be largely converted from readily ignited fuels to ignition-resistant landscape and structures that are provided defensible space consistent with State of California and County standards, access for firefighters and early evacuations, water and fire flow to code, and other fire protection features, as described throughout this FPP.

Ignition-Resistant Structures

The ignition-resistant requirements for new communities built in high or very high fire hazard severity zones have been determined by state and local fire agencies to provide acceptable resistance to ignition from the types of wildland fires produced by the County's wildland fuels, terrain, and weather. San Diego County conducted after-fire assessments that strongly indicate that the building codes are working in preventing home loss. Of the 15,000 structures within the 2003 Cedar Fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 Witch Creek Fire perimeter, 17% were damaged or destroyed. Only 3% of the 789 homes that were built to 2001 codes were impacted, and only 2% of the 1,218 structures built to the 2004 codes were impacted (IBHS 2008). Many of the newer structures that were lost were due to human error. Similarly, of 194 structures lost or damaged in the Orange County Freeway Complex Fire (2008), there were no

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structures within the fire perimeter lost that were built to at least the 1996 special fire area codes (similar to the CBC Chapter 7-A requirements) enacted by the City of Yorba Linda (Orange County Fire Authority 2008). Those codes required structure hardening against wildfire, but were less restrictive and result in less ignition-resistant structures than current San Diego County Building and Fire Code requirements. Structures built to the 2016 Fire and Building Codes result in highly ignition and ember resistant structures. When combined with maintained FMZs, fire apparatus access, water (fire flow), and an equipped and trained responding fire agency, the result is a defensible project.

Effective Fuel Modification Zones

Provisions for modified fuel areas of at least 100 feet separating wildland fuels from structures have also reduced the number of fuel-related structure losses by providing separation between structures and heat generated by wildland fuels. FMZs of 100 feet in width that are correctly designed, installed, and maintained over time have been shown to provide effective defensible space.

As such, most of the primary components of the layered fire protection system provided for the Proposed Project are required by SDCFA. However, they are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. In addition, interior fire sprinklers, which would be provided in all structures (now required by code), have a track record of extremely high reliability (Bukowski et al. no date) approaching 98%, and statistics indicate that fires in homes with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall 2013). Although not designed for wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into the 2007 California Building Code and have been retained and enhanced in code updates since then. The following Proposed Project features are required for new development in WUI areas and would form the basis of the system to provide adequate access by emergency responders and provide the protection necessary to minimize structural ignitions:

- Application of the latest adopted ignition-resistant building codes
- Exterior wall coverings are to be non-combustible or ignition resistant
- Multipane glazing with a minimum of one tempered pane
- Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents)

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- Interior, automatic fire sprinklers to code for occupancy type
- Modern infrastructure, access roads, and water delivery system
- Maintained FMZs
- Fire apparatus access roads throughout the Project Area's developed areas

Ignition Sources

The types of potential ignition sources that currently exist in the area include overhead power lines, vehicles, roadways, and neighboring residential neighborhoods. The Proposed Project would introduce potential ignition sources, particularly more people in the area. However, mitigating this increase in potential ignition sources, the Proposed Project would convert more than 750 acres of ignitable fuels to lower flammability landscape and include better access throughout the Development Footprint, managed and maintained landscapes, and consistent human presence in the area, which would reduce the likelihood of arson, off-road vehicles, or shooting-related fires. In addition, the Proposed Project would include a fire station, apparatus, and staffing that would be able to respond quickly to reported fires.

The FMZs are designed to not only minimize wildfire encroaching upon the community, but also to minimize the likelihood that an ignition from the developed area spreads into the Otay Ranch RMP/MSCP Preserve by separating the unmaintained vegetation occurring outside the FMZs with that in the FMZs. Vegetation within the FMZs would be maintained and the first 50 feet irrigated, resulting in high fuel moisture, which is more difficult to ignite (USFS 2015); reduced fuel densities; lack of fuel continuity; and a reduction in the receptiveness of the landscape to ignition and fire spread. Fires from off site would not have continuous fuels across the Development Footprint and would, therefore, be expected to burn around and/or over the developed landscape via spotting. Burning vegetation embers may land on Proposed Project structures but are not likely to result in ignition based on ember decay rates and the types of non-combustible and ignition-resistant materials and venting that would be used within the Proposed Project and the ongoing inspections and maintenance that would occur in the Proposed Project's landscaped areas and FMZs.

The Proposed Project would comply with the applicable fire and building codes and would include a layered fire protection system designed to current codes and inclusive of Project Area-specific measures that would result in a Proposed Project that is less susceptible to wildfire than surrounding landscapes and that would facilitate firefighter and medical aid response. These features combined with the ignition resistance construction required result in consistency with San Diego County Guidelines and a resulting acceptable fire hazard risk.

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Would the project result in inadequate emergency access?

The Proposed Project would not result in inadequate emergency access. The proposed internal looped roadways meet County standards and provide emergency access over the roadways that include a minimum of 24 feet (two 12-foot-wide, unobstructed travel lanes) and additional width for parking. Additionally, the roads would provide residents the option to evacuate from at least two egress access points in two different directions from each neighborhood. Depending on the nature of the emergency, residents can exit to the north/northeast (towards Jamul) or to the south (towards Chula Vista) on Proctor Valley Road. In emergencies where it is safer to remain within the developed portions of the Project Area, temporary refuge within Village 14 would be possible as a last resort, if evacuation was considered unsafe, given the large area of developed landscape that would result from the Proposed Project's construction. The internal roadways from the residences to Proctor Valley Road would be provided fuel modified passageways. Portions of Proctor Valley Road to the north and south of the Proposed Project's developed areas would traverse through areas with natural vegetation (consistent with current fuels). The Proposed Project would provide a minimum of 20 feet of modified fuel areas along both sides of the road to provide a buffer that would act to reduce ignitions from vehicle-related causes and provide set back from wildland fuels. Similarly, connector roads between neighborhoods in Planning Areas 16/19 would include 50-foot-wide FMZs (exceeding the code requirement) on both sides of the roads.

Evacuation would be focused on early evacuations, long before fire was in the area, following the "Ready, Set, Go!" model, or else contingency options that would be available to this Proposed Project may be determined to be safer than evacuating by responding fire and law enforcement personnel. A Wildland Fire Evacuation Plan was prepared for the Proposed Project and would be provided to the residents so that all residents are aware of the evacuation routes, the fluidity of wildfire events, and the options that may be presented to them by responding law enforcement and/or fire personnel, Reverse 911, or other officials. An annual evacuation awareness program would be conducted, and online access to fire awareness educational material would be provided on the community's website.

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

The Proposed Project is projected by call volume analysis (using San Diego County per-capita call generation factor of 82 calls per 1,000 persons) to add approximately 338 calls per year to

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the SDCFA's existing call load. This call volume (0.9 calls per day) is not considered enough of an increase to require additional resources. However, to meet the County's General Plan 5 emergency minute travel time standard, the Proposed Project would require the provision of a new fire station within the Project Area. With the new fire station, SDCFA has indicated it can and would serve the Proposed Project (Appendix C). This fire station would be a residential fire station with two engine bays meeting SDCFA's current configuration standards for this type of facility, and the Proposed Project would provide a fire engine (Type I or II) to SDCFA's specifications. Staffing would include two career firefighter positions and one reserve until a threshold is reached where a third career position can be financed, and the reserve firefighter position would continue for a 4.0 staffing.

Interim fire protection during construction would be provided by Station 36 or possibly by a temporary station. The permanent fire station was planned for this area in the approved 1993 Otay Ranch GDP/SRP, and impacts associated with the construction and operation of the fire station have been analyzed as part of the Proposed Project's EIR and found to be less than significant after mitigation. Primary response (first in) would be provided by the Project Area's fire station. That station would be able to provide first engine response to roughly 96% of the Proposed Project's lots within the most restrictive standard of 5 minutes of travel, consistent with the San Diego County General Plan Safety Element for village and limited semi-rural residential areas. The next closest SDCFA station is Station 36, located at 14024 Peaceful Valley Ranch Road, approximately 5 miles from the midpoint of the Proposed Project along Proctor Valley Road. Station 36 can respond to a portion of the remainder of the Proposed Project's lots (approximately 1%) within 5 minutes of travel and the remainder of the lots within 6 minutes, well below the allowed 10-minute travel time allowed in the General Plan for semi-rural residential development. Station 36 averages roughly one call per day within its response area. The Proposed Project would provide funding for constructing, equipping, operating, and maintaining the new fire station. The station would be part of the proposed public safety facility, which is located in the Village Core, Central Village 14 phase.

Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The Proposed Project would be served by Otay Water District and sufficient water supplies would be available to serve the Proposed Project from existing entitlements and resources. SDCFA, and the Otay Water District require new development to meet a minimum 2,500 gallons per minute (gpm) fire flow. The Proposed Project is located within the Otay Water District boundary and already accommodated in the Otay Water District master plan. A 980 (elevation zone) water tank adjacent to Central Village 14 is planned. The Otay Water District has provided a water availability/will serve form to the Proposed Project (Appendix D).

The measures described in the responses to these significance questions are provided in more detail in the following sections.

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Fire Protection Plan

4 ANTICIPATED FIRE BEHAVIOR

4.1 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 Development Footprint given characteristic Study Area features such as topography, vegetation, and weather. The BehavePlus 5.0.5 fire behavior modeling software package, the latest version of the industry standard fire behavior prediction software, was used in evaluating anticipated fire behavior adjacent to proposed FMZs for the perimeter of the Proposed Project's developed areas. Results are provided below, and a more detailed presentation of the BehavePlus modeling and analysis, including fuel moisture and weather input variables, is provided in Appendix E.

4.1.1 BehavePlus Fire Behavior Modeling Effort

Fire behavior results derived from the BehavePlus modeling efforts are presented in Table 3 and in Figure 5. Six focused analyses (fire scenarios) were completed, each assuming worst-case fire weather conditions for a fire approaching the Project Area primarily from the northeast or southwest. These fire scenario areas, which were directly adjacent to the FMZs and around the perimeter of the Development Footprint, were modeled as short grass (Fuel Model 1), chamise chaparral (Fuel Model SH5), or coastal sage scrub (Fuel Model SCAL 18) fuel beds. This detailed analysis compared fire behavior adjacent to the proposed development with outputs including flame length (feet), rate of spread (mph), and fireline intensity (British thermal unit (Btu) per foot per second)).

Table 3
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/foot/second)	Spot Fire (miles)
<i>Scenario 1: 5%–20% – Flat to Upslope; Summer Weather Condition</i>				
Short grass (FM 1) ^a	2.8	<1.0	52	0.1
Chamise chaparral (SH5)	9.1	<1.0	697	0.2
Sage scrub (SCAL18)	10.7	<1.0	984	0.3
<i>Scenario 2: 20%–30% – Downslope; Peak Weather Condition</i>				
Chamise chaparral (SH5)	30.2 (34.2)	3.3 (4.4)	9,372 (12,229)	1.6 (2.0)
Sage scrub (SCAL18)	30.6 (33.7)	1.6 (1.9)	9,655 (11,868)	1.6 (2.0)
<i>Scenario 3: 10%–27% – Upslope; Peak Weather Condition</i>				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.3 (34.3)	1.6 (2.0)	10,125 (12,338)	1.6 (2.0)

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Table 3
BehavePlus Fire Behavior Modeling Results

Fire Scenario	Flame Length (feet)	Spread Rate (mph)	Fireline Intensity (Btu/foot/second)	Spot Fire (miles)
<i>Scenario 4: 5%–15% – Upslope; Peak Weather Condition</i>				
Short grass (FM 1)	12.7 (12.7)	8.3 (8.3)	1,415 (1,415)	0.9 (1.0)
Sage scrub (SCAL18)	31.0 (34.0)	1.6 (1.9)	9,888 (12,101)	1.6 (2.0)
<i>Scenario 5: 20% – Downslope; Summer Weather Condition</i>				
Short grass (FM 1)	3.0	<1.0	62	0.1
Chamise chaparral (SH5)	9.5	<1.0	759	0.2
Sage scrub (SCAL18)	11.1	<1.0	1,057	0.3
<i>Scenario 6: 40% – Downslope; Summer Weather Condition</i>				
Chamise chaparral (SH5)	7.6	<1.0	462	0.2
Sage scrub (SCAL18)	9.2	<1.0	706	0.2

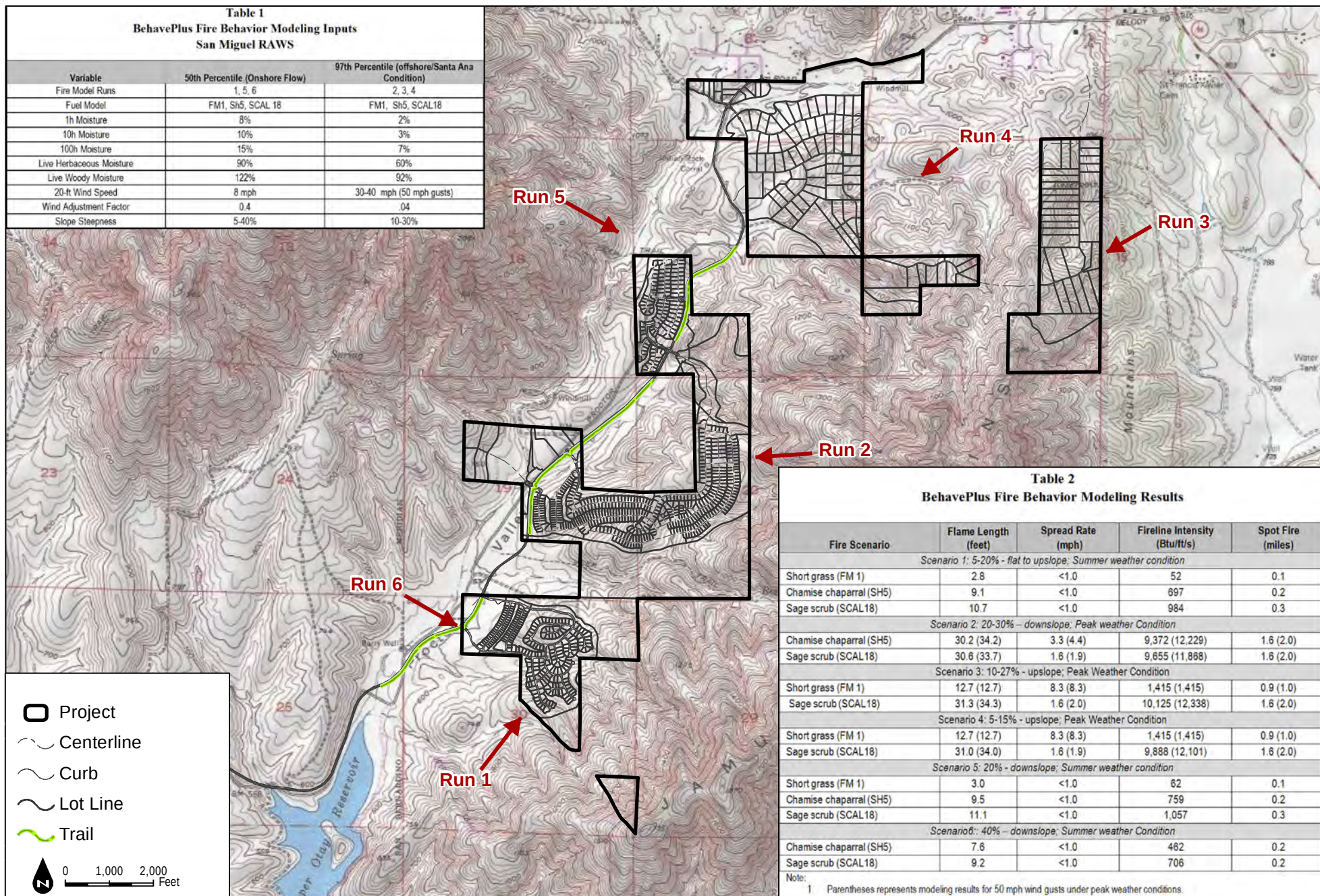
Btu = British thermal unit; FM = fuel model

^a Parentheses represents modeling results for 50 mph wind gusts.

Based on the results of BehavePlus analysis, worst-case fire behavior is expected in sage scrub-chaparral fuels along the northern and eastern edges of the proposed development during a strong (Santa Ana) wind-driven fire event (Scenarios 2, 3, and 4). Under such extreme weather conditions, flame lengths in the sage scrub-grassland fuel bed would approach 34 feet with fire spread rates ranging from approximately 4.4 mph for chamise stands and 8.3 mph for grasslands due to high winds and very low fuel moistures.

On the contrary, wildfires occurring during on-shore wind patterns are expected to be of low to moderate severity with flames lengths of 11.1 feet and slower spread rates (less than 1 mph) due to higher fuel moisture content and reduced wind speeds. Sage scrub fuel types can burn intensely and can produce a fast-spreading wildland fire under strong, dry wind patterns. This fuel type 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.

The results presented in Table 3 depict values based on inputs to the BehavePlus software 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. 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. As such, the proposed 100-foot FMZ width would be approximately 2.5 times wider than the longest calculated flame lengths for the northeastern portion of the proposed developed area. Whereas, the 100-foot FMZ width would be approximately 9 times wider than the calculated flame lengths for a fire during on-shore weather conditions.



SOURCE: Hunsaker 2015

DUDEK

Otay Ranch Village 14 and Planning Areas 16 and 19

FIGURE 5
Fire Behavior Modeling

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4.2 Fire Behavior Summary

Given the history of wildfire in the vicinity of the Project Area, including the 2007 Harris Fire that burned through the Project Area, combined with topography, vegetation, climate, nearby ignition sources, and anticipated fire behavior, the Project Area, in its current, pre-project condition, is considered to be vulnerable to wildfire ignition and spread during extreme fire weather. Wildfires may start on, burn onto, or spot into the Project Area. The most common type of fire anticipated in the vicinity of the Project Area is a wind-driven fire from the north/northeast, burning in the chamise chaparral and sage scrub fuel beds on the slopes of the Jamul Mountain range into the Proctor Valley.

The post-project condition of the Project Area would modify the historic ability of fire to spread in Proctor Valley. The Proposed Project's landscaped and irrigated areas and FMZs, as well as the paved roadways and ignition-resistant structures, would result in reduced fire intensity and spread rates around the Proposed Project, creating defensible space for firefighters. The result would be improved fire safety of the Project Area with regard to fire behavior, as well as for adjacent, down-wind communities.

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5 EMERGENCY RESPONSE AND SERVICE

5.1 Existing Fire Department Response Capabilities

The Proposed Project is located within the SDCFA responsibility area. The SDCFA has identified strategic response resource positioning at the Proposed Project's fire station that would provide efficient coverage for the Proposed Project.

The City of Chula Vista provides fire service to areas west/southwest of the Project Area and has a fire station located approximately 4 miles from the Project Area. Chula Vista Fire Department has not been considered for providing fire protection services for the Proposed Project for two primary reasons: (1) the Project Area is within SDCFA jurisdictional area, an agency that has indicated it can and would serve the Proposed Project, and (2) there are no existing or planned Chula Vista Fire Stations that can meet the County's 5-minute General Plan travel time standard for any portion of the Proposed Project.

The addition of SDCFA emergency response resources within the Proposed Project would provide enhanced coverage to this portion of the SDCFA response area and is considered to also benefit the City of Chula Vista Fire Department in its eastern City areas based on existing automatic aid agreements.

Based on current resources, there are up to three staffed fire stations with three fire agencies in the area. The SDCFA is a combination fire agency that uses both paid and reserve firefighters. Initial response to the Proposed Project would be either from Station 36 or from a temporary station located within the Development Footprint. Interim response timing threshold would be determined in a fire service agreement between the Proposed Project and SDCFA and would be drafted and ready to execute prior to the Proposed Project's Board of Supervisor's hearing. Station 36 at 14024 Peaceful Valley Road in Jamul is less than 2.5 road miles from the Proposed Project's northern entrances. Station 36 has seven full-time firefighters and the following apparatus:

- One structural fire engine
- One ladder truck
- One battalion chief
- One rescue squad truck
- One paramedic ambulance
- One light and air unit

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Fire Station 36 currently responds to approximately one call per day (2012 statistics). Because Station 36 cannot meet the General Plan's 5-minute travel time standard to those portions of the Proposed Project where it applies, the Proposed Project would be required and has agreed to build a station within the Development Area.

Vegetation fires require special apparatus and, depending on weather and fuel conditions, may require a significant response. SDCFA would be able to call on the Proposed Project station resources and the full CAL FIRE response weight, outlined as follows.

Proposed Proctor Valley Village 14 Station:

- Type I or Type II engine

Full CAL FIRE response:

- Five to 10 Type III engines (depending on dispatch level)
- Battalion chief
- Three fixed-wing aircraft (two tankers and air attack)
- Dozer
- Two hand crews
- Two helicopters

Although out of the direct protection area, the neighboring fire agency, City of Chula Vista Fire Department, includes resources that may be available to respond to emergency calls as second or third engine via the existing or an updated automatic or mutual aid agreement. Of the existing fire stations in the vicinity of the Proposed Project, Chula Vista's Fire Station 8 is the closest. Chula Vista Fire Station 8 is located at the intersection of Otay Lakes Road and Woods Drive, approximately 2.9 miles from the southern-most entrance to the Project Area. It houses a staffed engine company. This location does not allow a 5-minute travel time to the majority of the Proposed Project.

Currently, the closest ladder truck is housed at Station 36 in Jamul, approximately 2.5–6 road miles (depending on which part of the Project Area is calculated) east of the Development Footprint.

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5.2 Estimated Calls and Demand for Service from the Proposed Project

As indicated in Table 4, using San Diego County Fire Agencies' estimate of 82 annual calls per 1,000 population, the Proposed Project's conservatively estimated 4,028 permanent residents, and 94 staff associated with the mixed-use areas, would generate approximately 338 calls per year (0.9 calls per day). Of these calls, at least 70% are expected to be medical emergencies and 2.3% fire-related calls, based on typical call volumes (personal experience of author working in San Diego County fire jurisdictions).

Table 4
Calculated Call Volume Associated with
Otay Ranch Village 14 and Planning Areas 16/19

Emergency Calls per 1,000	Number of Residents, Guests, and Staff ^a	Average No. Calls per Year (5,598/1,000)x82	Avg. No. Calls per Day (377/365)
82	4,122 (estimate)	338	0.9

^a Population estimates based on 3.6 persons per residential dwelling unit for all occupancy types.

5.3 Fire Response Modeling

The San Diego County General Plan Safety Element includes travel time standards from the "Closest Fire Station" (County of San Diego 2011). Travel time does not represent total response time, which is calculated by adding the travel time to the call processing time and to the turnout/reflex time. Generally, the call processing and turnout/reflex time would add between 2 and 3 minutes to the travel time. Table 5 from the County General Plan's Table S-1 establishes a service level standard, not a requirement, for fire and first responder emergency medical services that is appropriate to the area where a development is located. Standards are intended to (1) help ensure development occurs in areas with adequate fire protection and/or (2) help improve fire service in areas with inadequate coverage by requiring mitigation for service-level improvements as part of Proposed Project approval.

Table 5
Travel Time Standards from the Closest Fire Station^a

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards ^b
5 minutes	Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1) Commercial and Industrial Designations in the Village Regional Category Development located within a Village Boundary	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.

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Table 5
Travel Time Standards from the Closest Fire Station^a

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards ^b
10 minutes	Semi-Rural Residential Areas (>SR-1 and SR-2 and SR-4) Commercial and Industrial Designations in the Semi-Rural Regional Category Development located within a Rural Village Boundary	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes, and longer distances make it difficult to achieve shorter travel times.
20 minutes	Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) All Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.
>20 minutes	Very-low rural land densities (RL-40 and RL-80)	Application of very-low rural densities mitigates the risk associated with wildfires by drastically reducing the number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.

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

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

The Proposed Project would be subject to the San Diego County General Plan 5-minute travel time standard post development based on its parcel sizes and Proposed Project densities and applying the most restrictive travel time. Village 14 would be entirely within the 5-minute travel time. However, Planning Areas 16/19 include characteristics consistent with Semi-Rural designation, which would be allowed up to 10 minutes travel time, although with existing Station 36, the response travel time is calculated to be less than 6 minutes.

To understand fire department response capabilities, Dudek conducted an analysis of the travel-time response coverage from the closest, existing stations and from the proposed Otay Ranch Village 14 public safety site (fire station). This modeling analysis was conducted using network analyst tools within GIS software, road data files, and Proposed Project development plan data. Response travel speed for this analysis was held constant at 35 mph, consistent with the Insurance Services Office Public Protection Classification Program's Response Time Standard, and incorporated impedances (slowdowns) for intersections and turns by the model. This average speed has been validated for the Insurance Services Office as still being applicable as a predictive tool and considers average terrain, average traffic, weather, and slowing down for intersections. Proctor Valley Village circulation systems include certain traffic-calming tools to improve pedestrian

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safety, and a 35 mph response travel speed is considered appropriate because the Villages' street sections comply with fire access travel width requirements. Model output files were used to analyze the quantity and percentage of individual Proposed Project units that could be reached by fire response personnel from each station, assuming travel time and speed constraints.

Once the network data set parameters were finalized, Dudek ran network models to depict the response coverage from the permanent public safety site location. The model results provided in Appendix F depict the geographic limits that can be reached within travel time intervals. The closest existing SDCFA station, Station 36 in Jamul at the intersection of Peaceful Valley Road and Campo Road, is capable of reaching roughly 4% of the Proposed Project's lots (but nearly 95% of Planning Areas 16/19) within the 5-minute travel time and all of Planning Areas 16/19 within 6 minutes. Responses vary from 3 minutes in the northerly Project Area up to roughly 10 minutes travel for the most southerly neighborhoods. These travel times are better than the existing Chula Vista Fire Stations (Nos. 6 and 8) with Station No. 6 not capable of responding to any of the Proposed Project within 5 minutes and requiring as long as 15 minutes for portions of Planning Area 16. Station 8 may reach the southern portions of Village 14 in just more than 5 minutes of travel, but requires up to 14 minutes for the northern portion of Planning Area 16. Table 6 presents tabular results of the emergency response analysis.

Table 6
Emergency Travel Times from Proposed
Public Safety Site and San Diego County Fire Authority and Chula Vista Closest Stations

5-Minute Travel Time	Quantity of Units Reached within 5 Minutes	Percentage of Residential Units Reached within 5 Minutes	Quantity of Units Reached within 10 Minutes	Percentage of Residential Units Reached within 10 Minutes
Public Safety Site	1,075*	96%	44	4%
CVFD Station 6	0	0%	994*	89%
CVFD Station 8	0	0%	1,002*	90%
SDCFA Station 36	45	4%	987*	88%

CVFD = Chula Vista Fire Department

The travel time analysis considered proposed traffic-calming measures for the Proposed Project. The types of traffic calming proposed maintain the emergency travel speeds modeled for this analysis.

* Includes multifamily residential (116 units) and school (97 units).

As indicated in Table 6 and Appendix F, all of the proposed development lots within Village 14 can be reached within the most restrictive 5-minute travel time standard. The proposed fire station can reach approximately 96% of the Proposed Project's developable lots within 5 minutes of travel, and Station 36 can reach approximately 1% of lots within 5 minutes of travel. The remaining 3% of lots can be responded to within 6 minutes, well within the General Plan's 10-

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minute travel time for semi-rural residential. Additional response, as needed, can potentially be provided by the other modeled existing fire stations. Based on this information, the Proposed Project meets the County's travel time standard, and the SDCFA can provide significant resources to emergency calls within the Proposed Project.

Response Capability Impact Assessment and Mitigation

The Proposed Project includes a significant number of new homes, a school site, and commercial structures. Service level requirements could, in the absence of fire facilities and resources improvements, cause a decline in the SDCFA response times and capabilities. The requirements described in this FPP are intended to aid fire-fighting personnel and minimize the demand placed on the existing emergency service system. However, additional firefighting capabilities and resources would be required to meet the demands created by the Proposed Project.

To avoid potential degradation of services, meet the anticipated increased demand in accordance with County emergency travel times in compliance with SDCFA requirements, and respond to the risks, the Proposed Project would be required to provide additional firefighting and emergency medical response capabilities. General additional resources required to serve the Proposed Project are outlined in Section 5.4 of this FPP.

5.4 Proposed Project Fire and Emergency Services

The following summary provides information pertaining to fire and emergency service response configuration for the Proposed Project. Final fire and emergency services may include implementation of an optional configuration, discussed below.

Proposed Project Fire and Emergency Response Configuration

As discussed, the Village 14 portion of the Project Area is subject to the 5-minute travel time standard. To ensure that all lots within Village 14's Development Footprint could be served within a 5-minute travel time, the public safety site would be centrally located within the Village Core. Not only does this provide for better response coverage, but the location adjacent to the neighborhood Village Green park, and across from the mixed-use and elementary school site ensure the public safety site would also be a civic presence and located near the highest anticipated potential call-generating land uses. Timing of construction of a temporary station (if the permanent station is not constructed at the commencement of construction) and a permanent fire station within the Proposed Project would be finalized and documented in a Fire Services Agreement between the Proposed Project applicant and the SDCFA. The temporary fire station, if necessary, would be available and located with SDCFA guidance so that it is available during vertical construction and for a specified period. Construction of the permanent fire station would

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be on the public safety site identified in the Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan and Tentative Map at an agreed upon trigger threshold, that would be detailed in the Fire Services Agreement.

The Proposed Project would provide fair share funding toward staffing and equipping the station of a size that would be needed to serve the Proposed Project's generated calls. The type and size of the permanent fire station would be based on the projected call volume and the anticipated apparatus and staffing. The fire station would include a Proposed Project-provided advanced life support Schedule A engine company. The station would be equipped with a fire engine, potentially a Type II interface fire engine that is suited to respond to structure fires or vegetation fires. Staffing is expected to include an interim period where two career firefighter positions and one reserve position are provided until a unit count or similar threshold is reached, at which time, staffing would include three career positions and a reserve. Depending on the number of emergency medical calls generated by the Proposed Project, the ambulance provider may elect to move a unit to the Proposed Project, but that would be an independent decision for the ambulance provider. A Fire Service Agreement would be drafted and ready to execute by the Proposed Project applicant and the SDCFA prior to the Proposed Project's Board of Supervisor's hearing.

In addition to the fire station provided by the Proposed Project, SDCFA has a Type I engine and a ladder truck company located at the existing Jamul Fire Station (Fire Station 36) (roughly 3 to 6 miles from the nearest and furthest portions of the Proposed Project). This is a four-person, advanced life support truck company that would be available to respond to the Project Area, as needed.

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6 FIRE SAFETY REQUIREMENTS – DEFENSIBLE SPACE, INFRASTRUCTURE, AND BUILDING IGNITION RESISTANCE

6.1 Fuel Modification Zones

6.1.1 Zones and Permitted Vegetation

As indicated in preceding sections of this FPP, an important component of a fire protection system is the FMZ. FMZs are designed to gradually reduce fire intensity and flame length and, therefore, reduce the fire from advancing by strategically placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of the community's WUI exposed structures, as well as around all structures, including the following:

- All residential and commercial occupancies
- School
- Public safety center/site
- Mixed-use sites
- Open space areas within the Development Footprint
- Emergency access roads or streets

Based on the modeled extreme weather flame lengths for the Proposed Project, average wildfire flame lengths are projected to be approximately 34 feet high in limited areas of Development Footprint-adjacent fuels. The fire behavior modeling system used to predict these flame lengths was not intended to determine sufficient FMZ widths, but it does provide the average predicted length of the flames, which is a key element for determining “defensible space” distances for providing firefighters with room to work and minimizing structure ignition. For this Proposed Project, the FMZ width outside the lot line is 100 feet, ranging from 2.5 to 10 times the modeled flame lengths based on the fuel type represented adjacent to the Development Footprint. There are five exception areas to the 100-foot-wide FMZ areas, as discussed in detail in Section 6.1.1.1.

The following FMZ requirements would be implemented for the Proposed Project. In addition to the FMZs meeting defensible space requirements, the entire developed landscape would be restricted to lower flammability landscaping as part of a fire adapted community approach. Limited building zones (LBZs) and/or LDAs would be established for each lot in Planning Areas 16/19 that borders the Otay Ranch RMP/MSCP Preserve. The LBZs and LDAs limit where buildings may be constructed on these larger lots by excluding their positioning within 100 feet of open space areas, with two exceptions where the LBZ is reduced to a minimum of 70 feet wide (Lots 15 and 16 in Planning Area 16). The FMZs, LBZs, LDAs, and landscape areas are

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presented graphically in Appendix G. The zones depicted for Planning Areas 16/19 in Appendix G are interim zones that would be customized due to the larger lots and unknown location of the structures. The larger lots in Planning Areas 16/19 would include 100-foot FMZs from the structure outward in all directions. In addition, the proposed fire adapted plant palette is provided in Appendix H.

Fuel Modification Zone Definition

FMZs are designed to provide buffers at perimeter areas of development projects to reduce fuel available to wildfire. These zones reduce fire spread rates and fire intensity by providing thinned fuels in the outer zones and irrigated, selective plantings in the inner zones. FMZs are typically 100 feet wide and are positioned around the perimeter of higher-density projects because the developed areas include lower flammability, maintained landscapes. In less dense development, like Planning Areas 16/19, FMZs start at the structures and extend outward. In addition, where a property is adjacent to Otay Ranch RMP/MSCP Preserve areas, an LBZ and/or LDA is provided that maintains a 100-foot-wide no-construction buffer (note exceptions for Lots 15 and 16 in Planning Area 16, which are provided a minimum of 70-foot-wide FMZs and alternative measures for structure protection). The LBZ can be used as an FMZ if an accessory structure is constructed adjacent to the LBZ. The LDA limits uses similarly to an LBZ but also excludes the use of irrigation.

Fuel Modification Zones in Village 14

The total width of the FMZs for Village 14 phases would be 120 feet, with the rear yards, which average 20 feet, included as part of the FMZ measurement. Therefore, a typical landscape/fuel modification installation for the Proposed Project's perimeter lots exceeds the 100-foot standard, consisting of up to a 120-foot-wide fuel management area from the structure extending outwards toward preserved areas.

Some development edge conditions would include an FMZ that is more than 100 feet in width and may include varying sizes of Zone 1 and Zone 2, such as adjacent parks and basins, which allow more FMZ flexibility due to the lack of residential structures. Refer to the Proposed Project's Specific Plan for examples of these conditions.

The provided fire station lot and adjacent park may require the placement of a heat-deflecting landscape wall on the northern boundary to mitigate a reduced FMZ. Depending on the placement of the buildings on the lot, a full FMZ may be possible. If not, then the 6-foot masonry (or other non-combustible) wall would be constructed under the approval of the SDCFA.

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Fuel Modification Zones in Planning Areas 16/19

The layout of the building structures on the large estate and ranchette lots in Planning Areas 16/19 cannot be determined at this time. As depicted in Figure 6, Typical Lots Greater Than 2 Acres – FMZ Scenarios, Planning Areas 16/19 would include both 100-foot-wide FMZs between individual buildings within each lot and areas designated as LBZs or Limited Building Areas adjacent to the Otay Ranch RMP/MSCP Preserve and open space areas. Figure 6 depicts various scenarios that may exist once building structures are sited on the lots at time of building permit. Therefore, the FMZ depicted in Figure 6 is an interim condition until the building structures are sited on the lots at building permit. The interim FMZ may be modified by SDCFA at building permit issuance. The following requirements would be implemented:

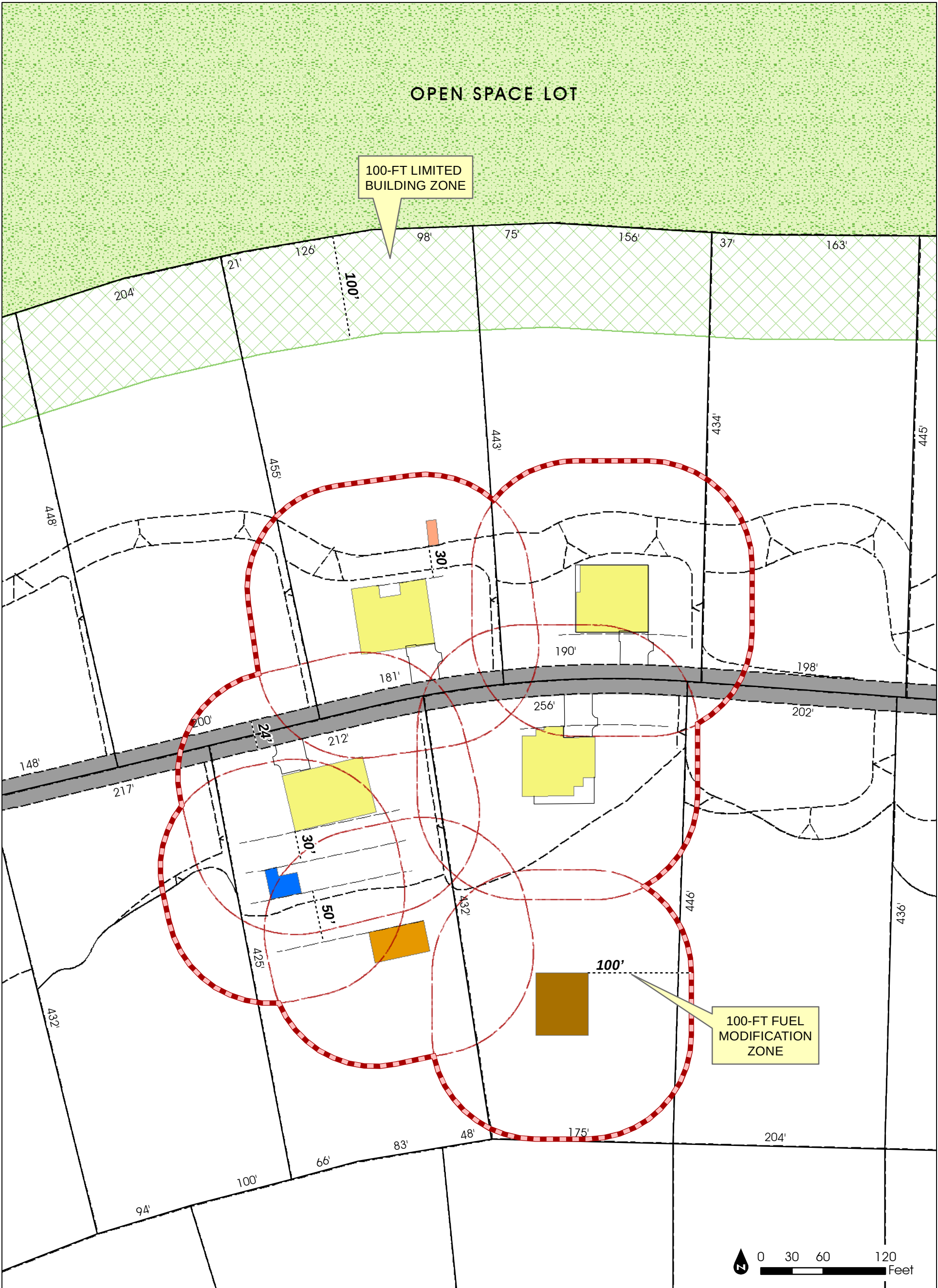
1. Primary residences would include 100 feet of FMZ in all directions to the property lines. Unless alternative materials or methods are approved by SDCFA, it is anticipated that neighboring properties would include overlapping FMZ areas, so the outer portion of a lot's FMZ may be provided by a reciprocal FMZ on a neighboring property, similar to a typical tract. The Covenants, Conditions, and Regulations (CC&Rs) would provide for reciprocal/overlapping FMZ easements and maintenance enforcement.
2. Small accessory structures consistent with the fire code, accessory structures that are less than 250 square feet and 30 feet or more from the primary residence are not considered structures with regard to providing additional fuel modification. They would be allowed within the 100-foot FMZ provided for the primary residence if they meet all other applicable requirements. If 250 square feet or larger, or within 30 feet of the primary residence, then the FMZ would be extended from the structure outward.
3. Large accessory structures that are 250 square feet or larger, regardless of their location, would be required to provide 100 feet of FMZ in all directions, unless alternative materials or methods are approved by SDCFA. The 100-foot-wide FMZ may include Project Area FMZ, or a combination of Project Area FMZ and off-site FMZ associated with neighboring property FMZs (reciprocating/overlapping FMZs). Where these options are not possible, such as when there is no off-site FMZ and a project cannot achieve a 100-foot-wide FMZ within its property boundary, then the property owner may submit to SDCFA for review a focused FPP indicating the building details, a lot development map with available FMZ measurements, and proposed mitigations for the reduced FMZ. Mitigations may include measures or combinations of measures, including an off-site FMZ easement from neighbor(s), building hardening, more restrictive FMZ (lower plant density), non-combustible ground cover, heat-deflecting landscape walls, or other measures.

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4. An LBZ would be required on portions of all large lots adjacent to Otay Ranch RMP/MSCP Preserve in Planning Areas 16/19. The LBZs would restrict the construction of accessory structures or other.
5. For buildings within 100 feet of Otay Ranch RMP/MSCP Preserve, LBZs would be recorded easements. Note that Lots 15 and 16 in R-14 in Planning Area 16 includes a 70-foot-wide LBZ.
6. Lots 15 and 16 in R-14 in Planning Area 16 include a mitigating condition for a heat-deflecting landscape wall on the eastern sides due to the potential inability to achieve a full 100 feet of FMZ. Depending on the placement of a residence on these lots, a 6-foot tall masonry wall would be placed at the top of slope on the edge of the building pad to augment the achievable FMZ. It is estimated that FMZs would be a minimum of 70 feet wide for these two lots.
7. Structures in R-13 (Planning Area 19) may receive reduced FMZ on the northern side, depending on position of structures on the lots. The reduced FMZs are considered appropriate given the off-site, adjacent properties that are developed and include disturbed and maintained landscapes.

Fuel Modification Zone Discussion

Research has indicated that the closer a fire is to a structure, the higher the level of heat exposure (Cohen 2000). However, studies indicate that given certain assumptions (e.g., 10 meters of low-fuel landscape, no open windows), wildfire does not spread to homes unless the fuel and heat requirements (of the home) are sufficient for ignition and continued combustion (Alexander 1998; Cohen 1995). Construction materials and methods can prevent or minimize ignitions. Similar case studies indicate that with nonflammable roofs and vegetation modification from 10 to 18 meters (roughly 32–60 feet) in Southern California fires, 85%–95% of the homes survived (Foote and Gilless 1996; Howard et al. 1973).



- | | | | | | |
|--|-------------------------------------|--|-------------------------------|--|---------------------|
| | Combined 100-Ft FMZ | | Typical Residence-4500 SF | | Barn - 1500 SF |
| | 100-Ft FMZ | | Cabana/ /Guest House - 800 SF | | Large Barn -3000 SF |
| | Limited Building Zone (100-Ft Wide) | | Barn - 250 SF | | Road |
| | Open Space Lot | | | | |

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These results support Cohen's (2000) findings that if a community's homes have a sufficiently low home ignitability (i.e., 2017 San Diego County Consolidated Fire Code and 2016 California Building Code), the community can survive exposure to wildfire without major fire destruction. This provides the option of mitigating the wildland fire threat to homes/structures at the residential location without excessive wildland fuel reduction and focusing the effort in the areas nearest the structures. Cohen's (1995) studies suggest, as a rule-of-thumb, larger flame lengths and widths require wider FMZs to reduce structure ignition. For example, valid structure ignition assessment model 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 may require approximately 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). This study used bare wood, which is more combustible than the ignition-resistant exterior walls for structures built today.

Obstacles, including steep terrain and non-combustible walls, can block or deflect all or part of the radiant heat, thus making narrower FMZ distances possible. Fire behavior modeling conducted for this Proposed Project indicates that fires in the off-site areas would result in roughly 34-foot-tall flame lengths under extreme conditions.

As indicated in this report, the FMZs, which are adjacent to all Proposed Project structures and outside of the Otay Ranch RMP/MSCP Preserve, and additional fire protection measures proposed for this Proposed Project provide a wildfire buffer, and for Village 14, exceed the standard 100-foot-wide, two-zone standard. The zones are based on a variety of analysis criteria, including predicted flame length, fire intensity (Btu), Study Area topography and vegetation, extreme and typical weather, position of structures on pads, position of roadways, adjacent fuels, fire history, current versus proposed land use, neighboring communities relative to the Proposed Project, and type of construction. The fire intensity research conducted by Cohen (1995), Cohen and Butler (1996), Cohen and Saveland (1997), and Tran et al. (1992) supports the fuel modification proposed for this Proposed Project.

General Criteria

- All plant material listed on the Proctor Valley Village FPP prohibited plant list (Appendix I) would be prohibited within any FMZ.
- 50%–70% of the overall FMZs shall be planted with deep-rooting plant material.
- Debris and trimmings produced by thinning and pruning shall be removed, except for larger woody debris that may be chipped and left for weed and erosion control.
- There shall be no hedging of shrubs so that they do not form a means of rapidly transmitting fire from the native growth to the structures.

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- Shrubs may be planted in clusters not exceeding a total of 400 square feet.
- A distance of no less than the width of the largest shrub's mature spread shall be provided between each shrub cluster.
- Non-shrub avenues devoid of shrubs shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6 feet and spaced a distance of 200 linear feet on center.
- Where shrubs or other plants are planted underneath trees, the mature tree canopy shall be maintained at a height no less than three times the shrub or other plant's mature height to break up any fire laddering³ effect.

Zone 1A – Setback Zone (Village 14)

Zone 1A – Definition

Zone 1A is the first 20 feet (rear yard) from the structure to the lot line in the Village 14 phase areas. This area would be included in the overall Project Area reduced fuel zones. Homeowners would be responsible for ensuring that rear-yard landscaping is compliant with this FPP. The Proposed Project's HOA would include a landscape committee to review and approve landscape plans and provide ongoing education to homeowners regarding fire adapted landscape maintenance.

Zone 1

Zone 1 – Definition

Zone 1 would include all public and private areas located between the lot line and 50 feet outward. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as shown in the landscape fuel figure (Figure 6).

Some perimeter lots receive extended Zone 1 FMZs on manufactured slopes or internal fire-safe common area landscaping. These 100-foot-wide FMZs exceed the code requirement by providing low fuel densities and irrigated fuels for the entire 100 feet versus 50 feet of irrigated and 50 feet of thinned area.

³ 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.

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Zone 1 – Specific Criteria:

- This irrigated high plant moisture zone shall be serviced by a permanent, automatic irrigation system that keeps plants hydrated via efficient drip irrigation.
- No tree limb encroachment would be permitted within 10 feet of a structure or chimney, including outside barbecues or fireplaces.
- A minimum of 10 feet would be required between tree canopies.
- Tree maintenance includes limbing-up (canopy raising) 6 feet or one-third the height of a mature tree.
- Additional trees (excluding prohibited or highly flammable species) may be planted as parkway trees on single loaded streets.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 18 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 24 inches.
- Ground covers must be of high-leaf moisture content.
- Shrubs shall be less than 2 feet tall, on 5-foot centers.
- Randomly placed, approved succulent-type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three and a minimum of 5 feet away from described “clear access routes.”
- Vegetation/landscape plans shall be in compliance with this FPP.

Zone 2

Zone 2 – Definition

Zone 2 would include all public and private areas located between the outside edge of Zone 1 and 50 feet outward. These areas may be located on public slopes, private open space lots, public streets, and/or private yards, as shown in the landscape fuel modification figure (Figure 6).

Zone 2 – Specific Criteria

- Represents a 50% thinning zone – 50% less fuel than on adjacent unmaintained Otay Ranch RMP/MSCP Preserve areas. Zone 2 areas would include removal of dead/dying vegetation, exotics, and plant species listed on the prohibited plant list. Removal of these components would result in 50% thinning of the existing fuels. As necessary to meet the

Otay Ranch Village 14 and Planning Areas 16/19 Fire Protection Plan

50% thinning objective, other plants would be removed to create a mosaic of vegetation with adequate spacing and discontinuity.

- All manufactured slopes within this area would be serviced by a temporary, aboveground automatic irrigation system that would be turned off once the plantings are established but would remain in place.
- Trees may be located within this zone, provided that they are planted in clusters of no more than three. A minimum distance of no less than 20 feet shall be maintained between the tree cluster's mature canopies. The trees would be limbed up to maintain vertical separation from understory shrubs.
- Only those trees on the approved plant list (Appendix H) and/or those approved by the biologist shall be allowed within this zone.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 36 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 48 inches.
- Randomly placed, approved succulent-type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three.
- Single specimen native shrubs, exclusive of chamise and sage, may be retained, on 20-foot centers.

6.1.1.1 *Potential Exception to 100-Foot FMZ*

Village 14 – Public Safety and Park Site

Depending on the final positioning of the fire station (on the designated public safety site) and park to the south of the public safety site, the 100-foot-wide FMZs may be reduced to no less than approximately 70 feet. Should this situation be necessary, the following measures would be implemented to provide equivalent protection as the full 100 feet:

- The entire 70 feet or more will be Zone 1, irrigated zone or a combination of irrigated plants and non-combustible ground cover.
- A heat-deflecting landscape wall would be provided at the property line adjacent these properties where 100 feet of FMZ is not achievable.

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Planning Area 16 – Lots 15 and 16

These two lots are constrained by the Proposed Project boundary on their east sides. Depending on final building location, FMZ of more than 70 feet wide may be possible. In no case would the FMZ be less than 70 feet. In addition, a 6-foot-tall, heat-deflecting landscape wall of masonry or masonry/fire-rated glass would be provided at the adjacent state ownership boundary at top of slope. This wall would be positioned at the top of slope as a barrier between the native fuels and the FMZ and is intended to deflect heated air and flames upward and over the structures.

6.2 Other Vegetation Management

6.2.1 Roadside Fuel Modification Zones (Including Driveways)

- High Btu producing, flammable vegetation, including shrubs and trees, shall be cleared and are prohibited (refer to the prohibited plant list in Appendix I).
- Tree and shrub canopies shall be spaced such that interruptions of tree crowns occur and horizontal spacing of 20 feet between mature canopies of trees or tree groups is maintained.
- Grass shall be mowed to 4 inches.
- Single tree specimens, fire resistive shrubs, or cultivated ground cover such as green grass, succulents, or similar plants used as ground covers may be used, provided they do not form a means of readily transmitting fire.
- All roads in the development would have vegetation clearance of flammable vegetation on each side, as follows:
 1. Fire access roads (any road that a responding fire engine would use to access an emergency) – 20 feet from edge of pavement.
 2. New roads/driveways – 20 feet from edge of pavement.
 3. Existing roads/driveways – 10 feet from edge of pavement, including along Proctor Valley Road to the north and south of the Project.
 4. Roads within Planning Areas 16/19 that connect neighborhoods would receive 50 feet of FMZ on either side (Appendix G).
- Trees may be placed within roadside vegetation management zones within the developed portions of the Proposed Project. The following criteria must be followed:
 1. Tree spacing must be 20 feet between mature canopies (30 feet if adjacent to a slope steeper than 41%).

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2. Trees must be limbed up one-third the height of mature tree or 6 feet, whichever is greater.
3. No tree canopies lower than 13 feet, 6 inches over roadways.
4. No tree trunks intruding into roadway width.
5. No trees or other plants on the prohibited plant list (Appendix I) are permitted.
6. No flammable understory is permitted beneath trees.
7. Any vegetation under trees to be fire resistive and kept to 2 feet in height or less, and no more than one-third the height of the lowest limb/branch on the tree.

6.2.2 San Diego Gas & Electric Easement

A San Diego Gas & Electric (SDG&E) easement occurs along the northern edge of Village 14 South. This easement will be maintained by SDG&E in accordance with its vegetation management program and standard policies mandated by the CPUC, including the GO 95 rules (CPUC 2015). Accordingly, hazardous fuel conditions will be addressed by SDG&E in a timely manner. The Proposed Project's provided FMZs adjacent to this area account for the native fuels that occur within this easement.

6.2.3 Trail Vegetation Management

Trails include the Community Pathway and a 5-foot-wide decomposed granite trail in Planning Area 16 that are adjacent to and accessible from public roads within the Project Area. Vegetation management alongside these roads/trails is not permitted within the state-owned and managed open space. Trail maintenance would occur on the trails to remove flashy fuels and maintain the trail in a useable, low fuel condition, but does not include removal of fuels along the sides of trails. The HOA/Community Facilities District would maintain trails in the public road right-of-way. Otay Ranch Preserve Owner/Manager, the State of California, or their designees will maintain trails within the Otay Ranch RMP/MSCP Preserve. Community trails would be accessible by emergency all-terrain vehicles, accessed at numerous locations within the community.

6.2.4 Parks and Open Space

- Landscaping within parks, detention basins, and maintained open space areas would be in compliance with the guidelines in this FPP as FMZs.
- Parks, detention basins, and maintained open space areas include 30 feet of Zone 1 fuel modification on the perimeter, and the remaining 70 feet (or in some cases, the entire park, basin, etc.) include characteristics of maintained Zone 1 standards, although are not technically included in the Proposed Project's FMZ.

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- LDAs are privately owned and development is not allowed other than infrastructure such as roads and utilities. LDAs are not part of the Otay Ranch RMP/MSCP Preserve. They are included as part of the private lots in the Tentative Map for Planning Area 16. LDAs can be used for fuel modification thinning zones. Fuel modification around pump stations would be provided and would be 50 feet wide.

6.2.5 Vacant Parcels and Lots

Vegetation management requirements would be implemented at commencement and throughout the construction phase, and require different maintenance specifications than post construction. Vegetation management would be performed pursuant to the fire authority having jurisdiction on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks of at least 30 feet would be created around all grading and other construction activities in areas where there is flammable vegetation.

In addition to the requirements previously outlined, the Proposed Project would comply with the following important risk-reducing vegetation management guidelines during construction:

- Vegetation management would not be required on vacant lots until construction begins. However, perimeter FMZs must be implemented prior to commencement of construction using combustible materials on individual lots or groups of lots.
- Vacant lots adjacent to active construction areas/lots would be required to implement vegetation management if they are within 30 feet of the active construction area. Perimeter areas of the vacant lot would be maintained as a vegetation management zone extending 30 feet from adjacent construction areas.
- Road construction would include the establishment of 30-foot-wide FMZ areas along both sides of graded roads. The FMZ areas may be established following grading of the road.
- Prior to issuance of a permit for any construction, grading, digging, installation of fences, etc. on a vacant lot, the 30 feet at the perimeter of the lot (Village 14) or the development pad (Planning Areas 16/19) is to be maintained as a vegetation management zone.
- In addition to the establishment of a 30-foot-wide vegetation management zone prior to combustible materials being brought into the Development Area, existing vegetation on the entire lot for Village 14 and on the developed portion of the lot for Planning Areas 16/19 would be removed.
- Dead fuel, ladder fuel (fuel that can spread fire from ground to trees), and downed fuels located on vacant lots and/or within the temporary FMZs would be removed and

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trees/shrubs would be properly limbed, pruned, and spaced prior to combustibles being brought into the Development Area.

- New power lines would be underground for fire safety during high wind conditions or during fires on a right-of-way that can expose aboveground power lines. Temporary construction power lines may be allowed in areas that have been cleared of combustible vegetation.
- A construction FPP would be prepared to minimize the likelihood of ignitions and pre-plan the Proposed Project fire prevention, protection, and response plan.
- Caution must be used not to cause erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. Fuel reduction work should include removal of aboveground biomass only. No uprooting of treated plants/fuels is necessary.

6.2.6 MSCP Preserve/Otay Ranch Preserve

A Community Facilities District, HOA, Otay Ranch Preserve Owner/Manager, or other legal entity approved by the SDCFA Fire Marshal (Approved Maintenance Entity) will obtain permission from the County, and/or the appropriate resource agencies (California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) prior to conducting vegetation management activities within any portion of the Otay Ranch RMP/MSCP Preserve.

6.2.7 Alternative Methods

The builder or private lot owner may submit a lot-specific risk assessment and detailed focused FPP to the SDCFA Fire Marshal proposing alternative methods of fire protection and providing justification for any variance from the recommended vegetation management zones, or encroachment into the LBZs, if there is a practical difficulty, or environmental constraint, in providing the entire size of the necessary vegetation management zone detailed herein. The focused FPP will need to fully justify any alternative means and methods/mitigation measures proposed for reductions in the FMZs and is subject to Fire Marshal approval.

6.2.8 Private Residential Lots

This FPP provides direction for community managed and maintained FMZs in the Village 14 phase areas and for privately maintained FMZ in Planning Areas 16/19. It also provides a guide for selecting lower-flammability plant material along with planting and maintenance requirements for private lot owners. The 100-foot FMZ would be required to be planted with low flammability plantings consistent with this FPP. In addition, it is recommended that none of the

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plant materials listed in Appendix I in this FPP, or otherwise known to be especially flammable, are allowed to be planted on private lots. This FPP, or a summary of its key points, would be provided to all buyers in a private property owner's guide to living in a fire environment. In addition, the Proposed Project CC&Rs would include a reference to the FPP, and the HOA's (or similar entity's) landscape committee would not approve plans that include any of the prohibited plant species to ensure compliance with the FPP.

6.2.9 Annual Fuel Modification Maintenance

Vegetation management would be completed annually by May 1 of each year and more often as needed for fire safety, as determined by the SDCFA. Homeowners and private lot owners would be responsible for all vegetation management on their lots, in compliance with this FPP, which is consistent with SDCFA requirements. The approved maintenance entity would perform FMZ maintenance in all Village 14 community FMZs and would be responsible for and would have the authority to ensure long-term funding, ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification on the perimeter and within interior maintained common areas, vegetation management, and maintenance requirements on all private lots, multifamily residences, school (SDCFA may inspect schools and enforce fuel modification requirements), parks, common areas, roadsides (including Proctor Valley Road), and open space under their control (if not considered Otay Ranch RMP/MSCP Preserve). Any water quality basins, flood control basins, channels, and waterways would be kept clear of flammable vegetation, subject to Section 6.2.6.

Planning Areas 16/19 FMZs would be maintained by individual property owners with HOA or another approved maintenance entity responsible for enforcing that all properties are maintained and consistent with the FMZ requirements of SDCFA and this FPP. The CC&Rs would provide for reciprocal/overlapping FMZ easements and maintenance enforcement. If an HOA or other funded entity is responsible for FMZ maintenance in Planning Areas 16/19, an inspection easement may be established. When FMZ non-compliances are documented, owners or responsible party would be provided with a violation notice and a timeline on when to mitigate the issue. If not completed within the timeline, then the HOA can remediate and collect payment from the homeowner. Alternatively, there may be instances where an FMZ violation would need to be turned over to SDCFA for additional enforcement and a lien placed on the property.

6.2.9.1 Annual FMZ Compliance Inspection

To confirm that the Proposed Project's common areas and Planning Areas 16/19 private lot FMZs and LBZs are being maintained according to this FPP, the approved maintenance entity would obtain an inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector,

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in May of each year, certifying that vegetation management activities throughout the Proposed Project have been performed pursuant to this FPP. LBZs would be recorded easements and part of the inspection program. This report would be funded (the maintenance entity would contract with an approved third-party inspector) by the approved maintenance entity and submitted to SDCFA for approval. Planning Areas 16/19 represent the more complicated FMZ maintenance scenario due to FMZs occurring on private lots vs Village 14, where FMZ primarily occurs on common areas. Homeowners would be provided a copy of this FPP and the FMZ maintenance requirements by the HOA or approved maintenance entity at time of purchase.

6.3 Road Requirements

6.3.1 Access

Access Roads

Project Area access, including road widths and connectivity, would comply with the requirements of the Consolidated County Fire Code (Section 96.1.503) (County of San Diego 2017). Appendix J presents the proposed road and street classifications, along with detailed measurements.

- All fire access and vehicle roadways would be of asphaltic concrete or approved alternative surfacing materials and designed and maintained to support the imposed loads of fire apparatus (not less than 75,000 pounds) that may respond, including Type I, II, and III engines, ladder trucks, and ambulances. Proposed Development Footprint roads would meet San Diego County Department of Public Works' (DPW's) Road Standards. Access roads would be at a minimum provided first layer of pavement prior to combustible construction occurring.
- Note that the existing Proctor Valley Road would be improved for its entirety. Improvements to Proctor Valley Road would be phased in to the satisfaction of the DPW and the SDCFA. Development Footprint roads would be constructed to a minimum unobstructed width of 24 feet and would be improved with aggregate cement or asphalt paving materials. There would be at least two points of primary access from Proctor Valley Road to South Village 14, Central Village 14, and North Village 14 phases, as well as the Planning Areas 16/19 phase for emergency response and evacuation. Interior residential streets would be designed to accommodate a minimum of a 75,000-pound fire truck.
- Fire access roads for each phase would meet Proposed Project-approved fire code requirements and/or mitigated modifications for maximum allowable dead-end distance, paving, and fuel management prior to combustibles being brought to the Development Area.

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- Fire lane road at commercial buildings, and schools (road closest to the building) would be 26 feet wide, per code or as approved by County Fire Marshal.
- Street parking would be provided on one or both sides of residential collector streets, depending on the location within the Project Area. Parking would be assumed to be 6 to 8 feet in width. Where road widths do not accommodate parking, restrictions would apply, per the DPW Road Modification, and the streets would be posted with signs stating “No Parking; Fire Lane.” Street sections are to be reviewed and approved by the County DPW and the County Fire Marshal.
- Roads with a median or center divider would have at least 12 feet of unobstructed width on both sides of the center median or divider. Emergency fire truck access points would be provided through the center divider at 1,000-foot intervals, where road segment length allows.

Secondary Access

- A minimum of two entrances from each of the Proposed Project phases would be provided. The location of these entrances satisfies the need for secondary access Figure 7a, Circulation Plan, indicates Proposed Project road circulation and secondary access.
- Any dead-end roads longer than 150 feet would have approved provisions for fire apparatus turnaround. Fire apparatus turnarounds would include a turning radius of a minimum 28 feet, measured to the inside edge of improved width (County of San Diego 2017, CCFC 96.1.503.2.4).
- The longest dead-end road (cul-de-sac) allowed by the County Consolidated Fire Code and CCR Title 14 varies by phase and lot size minimums. Maximum dead end road length in Village 14 South, Central, and North is 800 feet. No dead-end cul-de-sac lengths in these areas would exceed 800 feet.
 - Note that in the Southern Procter Valley Village, Streets “A” and “M” include wider roads and do not have driveways, enabling free traffic flow.
- The Planning Area 16 phase includes 2-acre and 3-acre lots, and Planning Area 19 phase consists of 1-acre lots, allowing 1,320 feet for dead-end road length. There are no dead-end road lengths greater than 1,320 feet. Area R-12 includes 4-acre and 5-acre parcels. The County of San Diego Consolidated Fire Code indicates a maximum dead-end road length of 1,320 feet, and the Proposed Project complies (County of San Diego 2017).
 - The Proposed Project complies with secondary access and avoidance of dead-end roads that exceed the allowable 800 or 1,320 feet, respectively.

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- Cul-de-sac bulbs are required on dead-end roads in residential areas where roadways serve more than two residences. Cul-de-sacs would be provided with a paved radius of 42 feet to allow for street parking within the cul-de-sac.
- Roadways and/or driveways would provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of each structure.
- 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 would not be installed or allowed to remain on roadways (County of San Diego 2017). Traffic-calming features (i.e., raised intersections, intersection neck downs, roundabouts, and parallel bay parking with landscape pop-outs) are proposed and may be allowed, subject to approval by the SDCFA and County DPW.
- Vertical clearance of vegetation along roadways would be maintained at 13 feet, 6 inches. Vertical clearance in the commercial areas to be clear to the sky to allow aerial ladder truck operation.
- Angle of driveway/roadway approach/departure would not exceed 7 degrees (12%) per SDCFA.
- Road grades would not exceed 15%, unless approved by the Fire Chief (maximum 20% with mitigations).
- Developer would provide information illustrating the new roads, in a format acceptable to the SDCFA, to update the SDCFA maps (County Fire Code, Section 96.1.505.5) (County of San Diego 2017).
- Any roads that have traffic lights would have SDCFA-approved traffic preemption devices (Opticom) compatible with devices on the Fire Apparatus, per SDCFA.

6.3.2 Gates

Access gates proposed for the Proposed Project would comply with SDCFA codes, Section 96.1.503.6 (County of San Diego 2017). Planned gate locations are illustrated in Figure 7b, Gates and Emergency Access. Public roads would not be gated. Any gates on private roads or on private driveways may be permitted but must comply with SDCFA standards for electric gates and would not represent a dead-end road condition that jeopardizes the dead end road length requirements for this Proposed Project.

- Access gates are to be equipped with a KNOX key switch, which overrides all command functions and opens the gate. All proposed gates would be equipped with sensors for detecting emergency vehicle “opticom” strobe lights and/or sirens from any direction of

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approach. Strobe detection and key switches would be provided on the interior and exterior of gates. Gates would automatically open when any vehicle approaches via vehicle detection loops.

- Switches may be dual keyed for SDCFA and law enforcement access.
- Gate activation devices would be equipped with a battery backup or manual mechanical disconnect in case of power failure.
- Further, gates would be:
 - Wider than the roadway;
 - Inclusive of area lighting;
 - Constructed from non-combustible materials;
 - Inclusive of provisions for manual operation from both sides, if power fails. Gates would have the capability of manual activation from the development side, via contact by a person or a vehicle (including a vehicle detection loop);
 - Located 30 feet from any intersecting road; and
 - Operable by activation with fire truck radio.

6.3.3 Driveways

Any structure that is 150 feet or more from a common road in the Development Footprint would have a paved driveway meeting the following specifications:

- Grades less than 20% with surfacing and sub-base consistent with the County Parking Design Manual.
- Driveways serving two houses or fewer would be 16 feet wide unobstructed with a fire apparatus turnaround. Driveways serving more than two houses would be 24 feet wide unobstructed.
- Driveways in excess of 150 feet would be provided hammerhead turnarounds to County Code.
- Driveway gates to comply with Section 6.3.2.

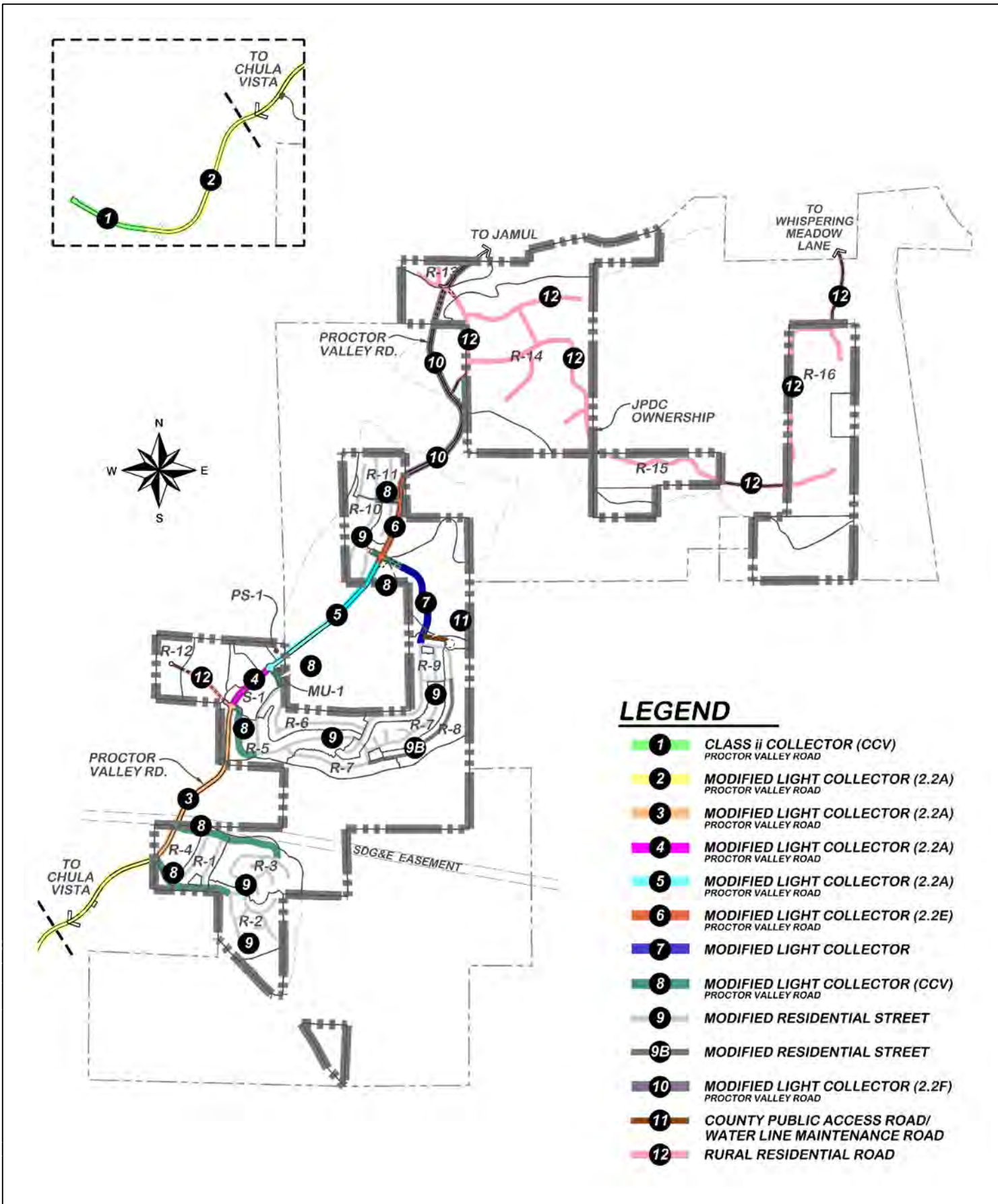
Identification of roads and structures would comply with County of San Diego Consolidated Fire Code, Section 96.1.505, as follows (County of San Diego 2017):

- All structures would be identified by street address numbers at the structure. Numbers would be 4 inches in height, 0.5-inch stroke, and located 6 to 8 feet above grade.

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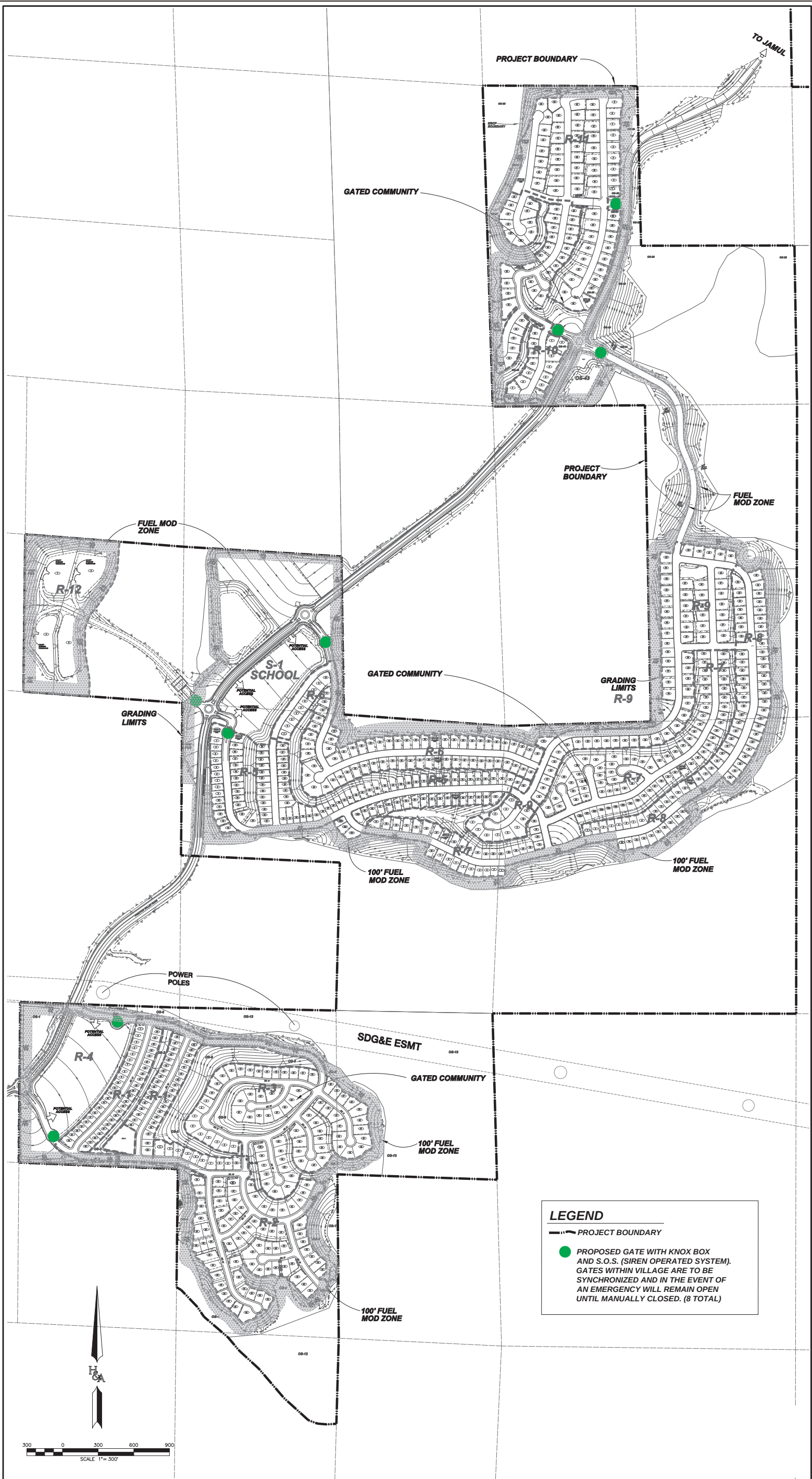
Addresses on non-residential buildings would be 6 inches high with 0.5-inch stroke. Address numbers would contrast with background.

- Multiple structures located off common driveways would include posting addresses on structures, on the entrance to individual driveways, and at the entrance to the common driveway for faster emergency response.
- Structures 100 feet or more from a roadway would include numbers at the entrance to the driveway.
- Proposed roads within the Proposed Project development would be named, with the proper signage installed at intersections to the satisfaction of the SDCFA and the DPW (County of San Diego Standard DS-13).
- Streets would have street names posted on non-combustible street signposts. Letters/numbers would be 4 inches high, reflective, on a 6-inch-high backing. Signage would be 7 feet above grade. There would be street signs at the entrances to the development, all intersections, and elsewhere as needed subject to approval of the Fire Chief.
- Access roads to private lots to be completed and paved prior to lumber drop and prior to the occurrence of combustible construction.



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SOURCE: HUNSAKER AND ASSOCIATES 2017

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Otay Ranch Village 14 and Planning Areas 16 and 19

FIGURE 7b
Gates & Emergency Access

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6.4 Structure Requirements

6.4.1 Ignition-Resistance

This section outlines ignition-resistant construction (for all structures) that would meet the requirements of the 2017 Consolidated County Fire Code and the County Building Code (County Code of Regulatory Ordinance; Title 9, Division 2), Chapter 701-A. The following construction practices respond to the requirements of these codes and are consistent with the 2016 California Fire and Building Codes (Chapter 7-A). Code updates are likely to occur before the Proposed Project is fully constructed. As such, building plans must meet the “then-current” County Building Code in effect at the time of building plan submittal. Appendix K provides a summary of the requirements for ignition-resistant construction.

There are two primary concerns for structure ignition: (1) radiant and/or convective heat and (2) burning embers (IBHS 2008; NFPA 2018). Burning embers have been a focus of building code updates for at least the last decade, and new structures in the WUI built to these codes have proven to be very ignition resistant.

Likewise, radiant and convective heat impacts on structures have been minimized through the CBC Chapter 7-A exterior fire ratings for walls, windows, and doors. Additionally, provisions for modified fuel areas separating wildland fuels from structures have reduced the number of fuel-related structure losses. As such, most of the primary components of the layered fire protection system provided the Proposed Project are required by the SDCFA and state codes. However, these requirements are worth listing because they have proven effective for minimizing structural vulnerability to wildfire and, with the inclusion of required interior sprinklers (required in the 2010 Building/Fire Code update), of extinguishing interior fires, should embers succeed in entering a structure. Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into local and state codes.

For instance, San Diego County after-fire assessments, indicate strongly that the building codes are working in preventing home loss; of 15,000 structures within the 2003 fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 fire perimeter, 17% were damaged or destroyed. A much smaller percentage (3%) of the 789 homes that were built to 2001 codes were impacted, and an even smaller percentage (2%) of the 1,218 structures built to the 2004 codes were impacted (IBHS 2008). It has been reasoned that by fire officials conducting after-fire assessments that damage to

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the structures built to the latest codes is likely from unmaintained flammable landscape plantings or objects next to structures or open windows or doors (Hunter 2008). The building codes developed for construction in high and very high fire hazard zones is working to minimize the vulnerability of new residences and other structures to wildfires. There are numerous examples of master planned communities built to ignition-resistant standards and include HOA-managed FMZs that have been tested by wildfire and functioned as they were intended. The Proposed Project incorporates a fire protection system that has been found by after-action fire reports, independent researchers, and U.S. Geological Survey researchers (2013) to perform well against wildfires. Newer communities, especially those within jurisdictions that have adopted the latest state Fire and Building Codes (like San Diego County), and that have a well-defined FMZ requirement, perform well against wildfires. Examples include Cielo in Rancho Santa Fe, 4S Ranch in San Diego County, Stevenson's Ranch in Santa Clarita, Serrano Heights in Orange County and many others in Southern California.

The following features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions and to provide adequate access for emergency responders. Although these standards would provide a high level of protection to structures in this development and should reduce the potential for ordering evacuations in a wildfire, there is no guarantee that compliance with these standards would prevent damage or destruction of structures by fire in all cases.

1. Exterior walls of all structures and garages are to be constructed with approved non-combustible (stucco, masonry, or approved cement fiber board) or ignition-resistant material from grade to underside of roof system. Wood shingle and shake wall covering is prohibited. Any unenclosed under-floor areas will have the same protection as exterior walls. Per County Building Code, Chapter 7-A: Exterior wall coverings to extend from top of foundation to the underside of roof sheathing, and terminate at 2-inch nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure). The underside of any cantilevered or overhanging appendages and floor projections will maintain the ignition-resistant integrity of exterior walls, or projection will be enclosed to grade.
2. Eaves and soffits will meet the requirements of SFM 12-7A-3 or be protected by ignition-resistant materials or non-combustible construction on the exposed underside, per County Building Code, Chapter 7-A.
3. There will be no use of paper-faced insulation or combustible installation in attics or other ventilated areas per County Building Code.

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4. There will be no use of plastic, vinyl (with the exception of vinyl windows with metal reinforcement and welded corners), or light woods on the exterior.
5. All roofs will be a Class “A” listed and fire-rated roof assembly, installed per manufacturer’s instructions, to approval of the SDCFA. Roofs will be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, to prevent intrusion of flame and embers. Any openings on ends of roof tiles will be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings will not be less than 0.019-inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley (County Building Code, Chapter 7-A).
6. No vents in soffits, cornices, rakes, eaves, eave overhangs, or between rafters at eaves or in other overhang areas. Gable end and dormer vents to be at least 10 feet from property line or provided alternative design resistant to ember penetration. Vents in allowed locations to be protected with wire mesh having no openings greater than 0.125 inches. Vent openings will not exceed 144 square inches. Vents will be designed to resist the intrusion of any burning embers or debris (County Building Code, Chapter 7-A).
7. Vents will not be placed on roofs unless they are approved for Class “A” roof assemblies (and contain an approved baffle system (such as Brandguard vents) to stop intrusion of burning material) or are otherwise approved.
8. Turbine vents are prohibited.
9. Exterior glazing in windows (and sliding glass doors, garage doors, or decorative or leaded glass in doors) to be dual pane with one tempered pane, or glass block or have a 20-minute fire rating. Glazing to comply with CBC Chapter 7-A.
10. Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWWDA 101/I.S 2 97 requirements.
11. Skylights to be tempered glass (County Building Code, Chapter 7-A).
12. Rain gutters and downspouts to be non-combustible. They will be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges (County Building Code, Chapter 7-A).
13. Doors to conform to SFM standard 12-7A-1, or will be of approved noncombustible construction or will be solid core wood having stiles and rails not less than 1.625 inches thick or have a 20-minute fire rating. Doors to comply with County Building Code,

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Chapter 7-A. Garage doors to be solid core 1.75-inch-thick wood or metal, to comply with code.

14. Decks and their surfaces, stair treads, landings, risers, porches, balconies to comply with language in County Building Code, Chapter 7-A, and be ignition-resistant construction, heavy timber, exterior approved fire-retardant wood, or approved non-combustible materials.
15. Decks or overhangs projecting over vegetated slopes are not permitted. Decks to be designed to resist failing due to the weight of a firefighter during fire conditions. There will be no plastic or vinyl decking or railings. The ends of decks to be enclosed with the same type of material as the remainder of the deck.
16. There will be no combustible awnings, canopies, or similar combustible overhangs.
17. No wood fences to be allowed within 5 feet of structures on any lots. The first 5 feet from a structure will be non-combustible or meet the same fire resistive standards as walls. The exception is that a wood gate may be used adjacent to a structure, if there is a 5-foot length of non-combustible or fire-resistive fencing between the gate and the remainder of the fence where it abuts the structure.
18. All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbecues and grills, to have spark arrestors that comply with the County Fire Code. The code requires that openings be maximum 0.5 inches. Arrestors will be visible from the ground
19. Any liquid propane gas (LPG) tanks (except small barbecue and outdoor heater tanks), firewood, hay storage, storage sheds, barns, and other combustibles will be located at least 30 feet from structures, and, within the FMZ, 30 feet from flammable vegetation. There will be no flammable vegetation under or within 30 feet of LPG tanks, or tanks will be enclosed in an approved ignition-resistant enclosure with 10 feet clearance of flammable vegetation around it. In no case will a tank be closer than 10 feet from the structure (consultant recommendation). County Fire Code requires 10 feet of clearance of native vegetation, weeds, and brush from under and around LPG tanks.
20. Storage sheds, barns, and outbuildings to be constructed of approved non-combustible materials, including non-combustible Class A roofs and will be subject to the same restrictions as the main structure on lot.
21. Additionally, any of the above-listed structures (i.e., outbuildings, storage sheds, barns, and separate unattached garages) that are greater than 500 square feet in size will be equipped with automatic fire sprinklers. Locations, and required FMZs, will be subject to approval of County Fire Marshal and the Building Official based on size of the structure.

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6.4.2 Enhanced Defensible Space

The Proposed Project would provide enhanced defensible space by strategically locating non-combustible walls for up to 38 perimeter lots abutting open space that also include a condition where structures are located at the top of a slope. Top of slope setbacks of 30 feet are desirable for two-story homes. These lots provide 20 feet of setback, and the walls are provided to mitigate the reduced setback by providing a barrier in the line of fire at the top of slope. The purpose of these walls is to enhance the protection provided by the FMZs and to provide a measure consistent with meeting the intent of top of slope structure setbacks. Lots 15 and 16 in Planning Area 16 and a section of the property line north of the fire station and public parks in Village 14 are provided walls as part of a system of protection enhancements to compensate for potentially reduced/modified FMZ areas.

Dudek determined that providing strategically located walls within the Development Footprint would result in additional protection by deflecting heat and flames away from structures, as indicated in Appendix L.

The Proposed Project's exterior lots adjacent to slopes provide opportunities to place a non-combustible, 6-foot-tall, heat-deflecting wall to provide additional deflection for these lots. When buildings are set back from slopes, and a wall is placed at the top of slope, flames spreading up those slopes are deflected vertically and over the structure where cooling occurs, reducing the effects of convective heat on the structure (see Figures 8 through 10 for wall and fencing cross-section diagrams). If a structure cannot be setback adequately, or where the slope is less than 30%, a noncombustible wall can help deflect the flames from the structure (NFPA 2013). The duration of radiant heat impact on the downhill facing side of the house is also reduced. An imaginary line extended along the slope depicts the path of the heat (hot air rises) and flame. The structure set back is important to avoid heat and/or flame intersection with the structure.

Heat-deflecting landscape view walls of masonry construction with fire-rated glazing that are 6 feet in height (roughly lower 2 feet masonry construction and upper 3 feet dual pane, one pane tempered glazing or equivalent) would be incorporated at top of slope/edge of lots adjacent to down-slopes as an enhancement to FMZs and defensible space (examples illustrated in Figures 8 through 10). The landscape walls would provide a vertical, non-combustible surface in the line of heat, fumes, and flame travel up the slope. Once these fire byproducts intersect the wall, they are deflected upward or, in the case where lighter fuels are encountered, they are quickly consumed, heat and flame are absorbed or deflected by the wall, and the fuels burn peaks out within a short (30 seconds to 2 minutes) time frame (Quarles and Beall 2002). If glass is used for view purposes, final determination as to actual type of listed glazing assembly would be to County Fire Marshal and Building Official approval.

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Heat-deflecting landscape walls have proven to deflect heat and airborne embers during numerous wildfires in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. Rancho Santa Fe Fire Protection District, Laguna Beach Fire Protection District, Orange County Fire Authority, and other entities include these walls as alternative methods based on observed performance during wildfires. This has led to these agencies approving use of non-combustible landscape walls as mitigation for reduced FMZs and reduced setbacks at top of slope. These walls are consistent with National Fire Protection Association (NFPA) 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2013 Edition, Section 5.1.3.3 (NFPA 2013) and A.5.1.3.3, and International Urban Wildland Interface Code. NFPA 1144, A.5.1.3.3 states: “Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures” (NFPA 2013). These walls and barriers are usually constructed of noncombustible materials (concrete block, bricks, stone, stucco) or earth with emergency access openings built around a development where 30 feet (9 meters) of defensible space is not available.

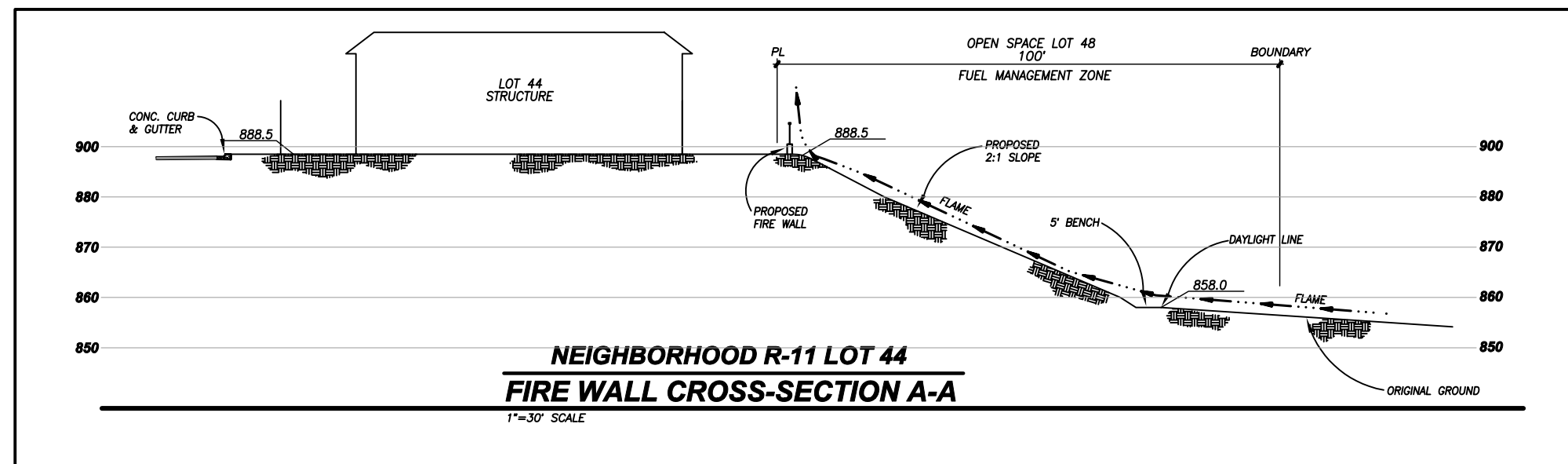
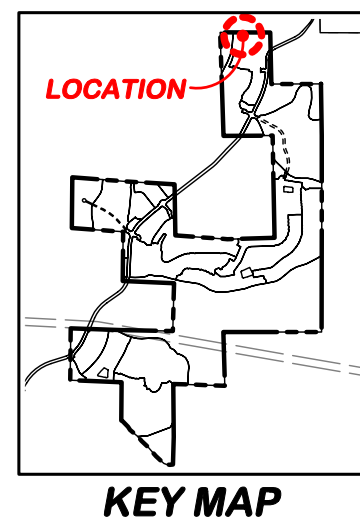
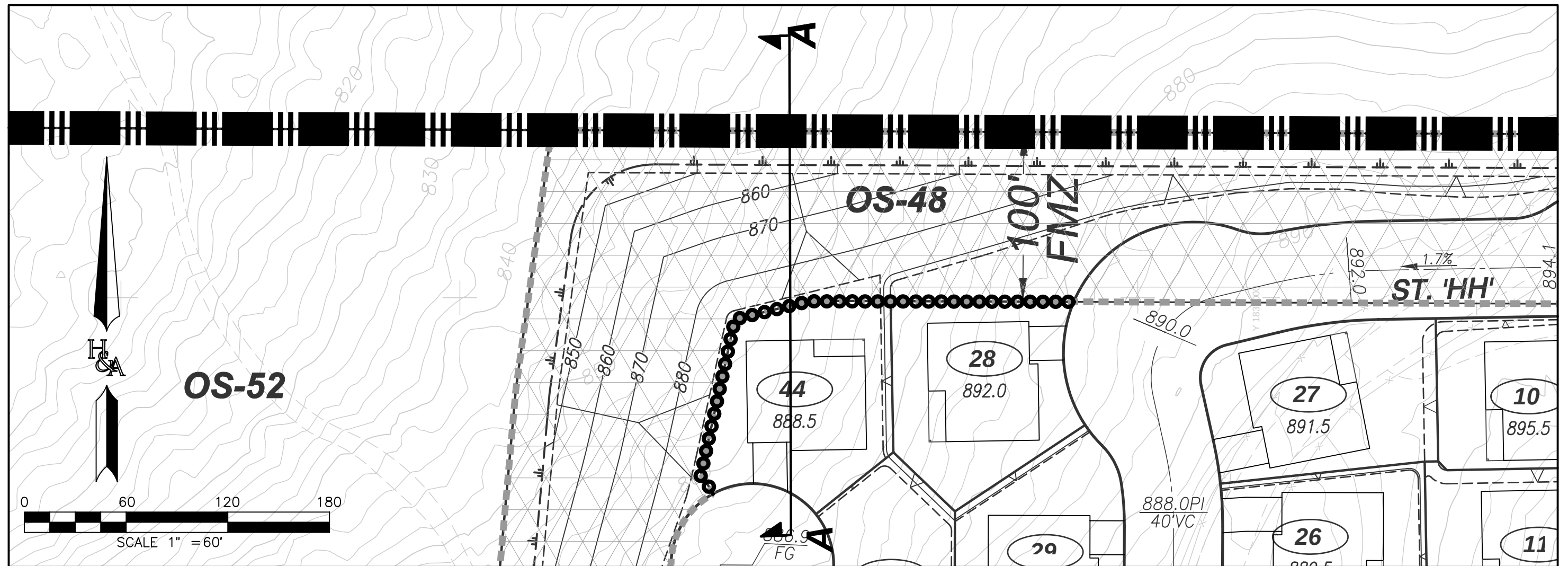
6.4.3 Fire Protection System Requirements

Infrastructure, Structural Fire Protection, and Fire Protection Systems

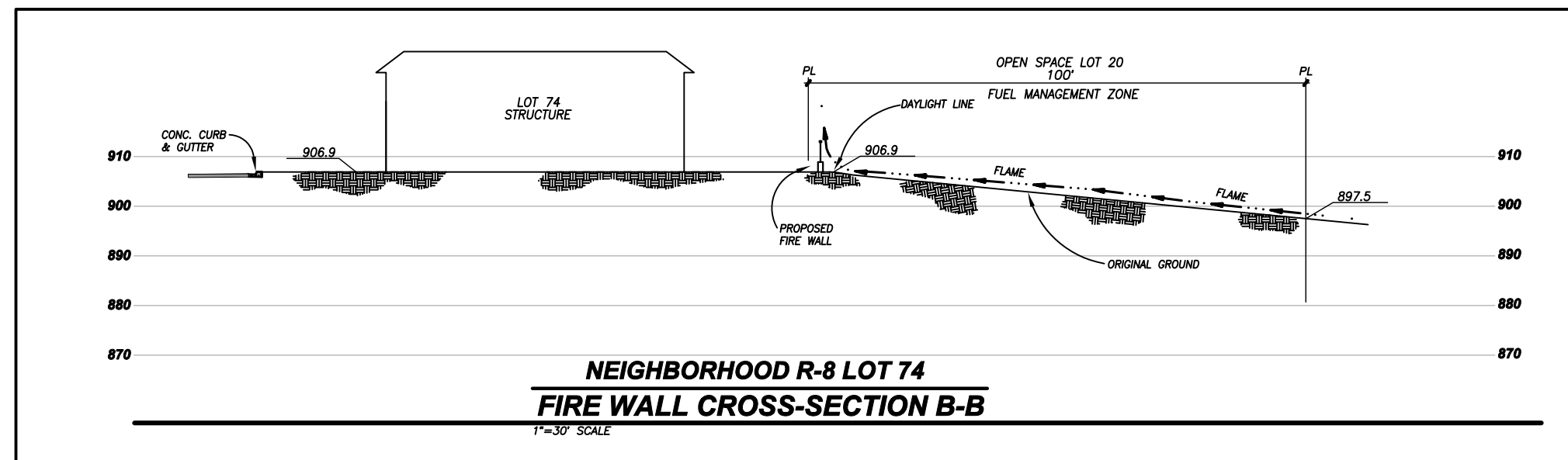
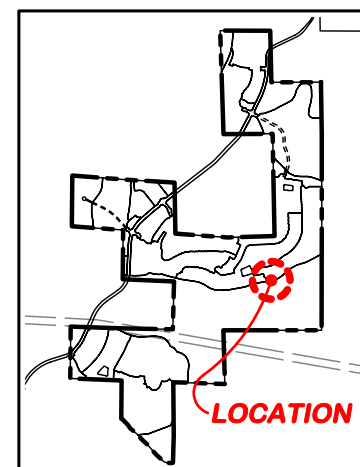
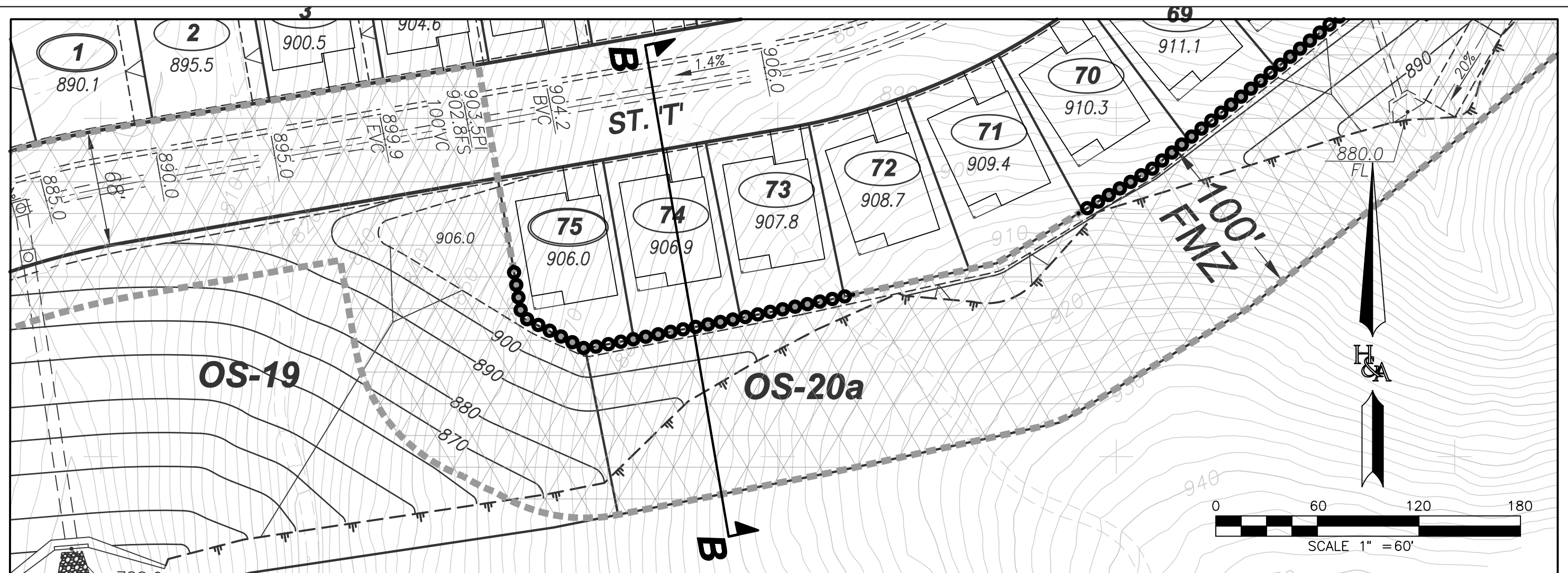
WUI fire protection requires a systems approach, which includes the components of vegetation management, structural safeguards (both previously addressed), and adequate infrastructure. This section provides recommendations for infrastructure components.

Infrastructure Recommendations

The following conceptual recommendations are made to comply with the SDCFA requirements, the California Fire Code, the County Consolidated Fire Code, and nationally accepted fire protection standards, as well as additional requirements to assist in providing fire protection.



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Water service would be provided by the Otay Water District. All water storage and hydrant locations, mains, and water pressures would be designed to fully comply with San Diego County Fire Code Fire Flow Requirement. Water supply must meet a 2-hour fire flow requirement of 2500 gpm with 20-pounds per square inch (psi) residual pressure, which must be over and above the daily maximum water requirements for this development, as confirmed in the Proposed Project's Water Technical Study (Dexter Wilson 2016).

Fire Hydrants

- Hydrants are subject to SDCFA approval. Hydrants would be located on the normal fire apparatus response side of the road at each intersection and at 350-foot spacing as required by the SDCFA. Where applicable, hydrants would be located at the entrance to cul-de-sac bulb (not in the bulb itself). Hydrants would be provided on each side of any divided road or highway.
- The water system for fire protection would be an approved water supply with hydrants and mains. Fire flow in the mains for residential occupancies would be at least 2,500 gpm in fire mains with a 20-psi residual at periods of maximum peak domestic demand. Fire flow for the multifamily, resort, and commercial occupancies would be a minimum of 2,500 gpm in fire mains and to County Consolidated Fire Code. No credit for sprinklers is available in wildfire prone areas. Duration of flow is 2 hours or more if required by the County Consolidated Fire Code based on the required flow. The amount of stored water for fire protection would be for the required duration (minimum 2 hours) at the worst-case fire flow at times of maximum peak domestic and commercial demand (including agriculture). Any private water systems would comply with NFPA 22 and 24. In addition, fire protection water systems would comply with American Water Works Association Standard M-31; "Distribution Requirements for Fire Protection."
- Hydrants would have one 2.5-inch outlet and one 4-inch outlet and be of bronze construction per the District Fire Code. Hydrants at commercial buildings and schools would have two 4-inch outlets and one 2.5-inch outlet. Fire protection engineer to make determination whether dry barrels are necessary due to freeze potential.
- Hydrants would have a 3- by 3-foot concrete pad at base (gravel if dry barrel hydrant) for weed control.
- Reflective blue dot hydrant markers (minimum 3-inch square) would be installed in the street to indicate location of the hydrant. The lateral shut-off valve would be located in the street 10–25 feet in front of hydrant.

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- Crash posts would be provided where vehicles could strike fire hydrants, fire department connections, etc.
- Fire hydrants would be provided every 1,000 feet along Proctor Valley Road and connector roads not adjacent to development.

Fire Sprinklers

All structures, of any occupancy type, are required by the SDCFA to have internal fire sprinklers. (Exception may be granted by SDCFA for detached accessory structures under 500 square feet). One- and two-family residences may have NFPA 13-D systems. Residential structures 7,000 square feet and larger may be required to have a four-head calculation. Enclosed patios and porches, workshops, barns, storage structures, separate unattached garages, RV structures, and auxiliary-use rooms more than 500 square feet are also required to have sprinkler protection. All other occupancies in this development would have fire sprinklers in compliance with SDCFA requirements and the applicable NFPA 13 standard. All systems other than single-family detached dwelling systems to be remotely supervised to an approved 24/7 alarm company.

Fire Alarm Systems

- All residential units would have electric-powered, hard-wired smoke detectors in compliance with Consolidated Fire Code.

6.4.4 Additional Requirements and Recommendations Based on Occupancy Type

This section includes conceptual occupancy-specific recommendations based on the type of occupancy.

Additional Commercial and School Building Requirements and Recommendations

All retail, commercial, and office buildings would comply with appropriate building codes, including application of Chapter 7-A, ignition-resistant construction. The schools would comply with California State Architects Office requirements. Construction in this area would comply with CBC, Chapter 7-A, and would comply with other state requirements for fire safety. Access, water supply, and hydrant plans for the schools are subject to SDCFA approval.

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7 WILDLAND FIRE EVACUATION PLAN

Early evacuation for any type of wildfire emergency at the Proposed Project is the preferred method of providing for resident safety, consistent with the SDCFA's current approach within San Diego County. As such, the Proposed Project's HOA would formally adopt, practice, and implement a "Ready, Set, Go!" (International Fire Chiefs Association 2013) approach to evacuation. The "Ready, Set, Go!" concept is widely known and encouraged by the State of California and most fire agencies. Pre-planning for emergencies, including wildfire emergencies, focuses on being prepared, having a well-defined plan, minimizing potential for errors, maintaining the Proposed Project's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and Project Area activities during periods of fire weather extremes.

Support for the "Ready, Set, Go!" model would be provided by preparation of a community Wildland Fire Evacuation Plan (WFEP) for the Proposed Project prior to occupancy. The WFEP would be based on standard evacuation planning used by San Diego County Office of Emergency Services. The WFEP would be reviewed to confirm that it provides Proposed Project residents with potential egress route information and instructions for following the "Ready, Set, Go!" model. The WFEP provides Project Area-specific procedures for wildfire evacuations, and once complete, would be provided to the Proposed Project's residents and commercial tenants, and posted on the community website. The WFEP would be reviewed by residents at least annually through organized meetings and educational outreach by the HOA, Community Services District, or other means.

The WFEP would form the backbone of hazard relocation/evacuation planning for the Proposed Project. Among the important concepts that would be included in the WFEP are a description of the area's fire environment, mitigation strategies, roles and responsibilities, homeowner education materials, preparedness checklist, route planning, and specific procedures for early relocation and contingency planning for situations where evacuation is considered unsafe.

This FPP provides considerable information that can be integrated into the WFEP. Climate, vegetation, topography, wildfire hazards, fire agencies, and other descriptive information in this FPP can be used in the WFEP. Additionally, this FPP outlines important relocation considerations that would be integrated into the WFEP, as described in the following sections.

Note that large-scale evacuations during wildfire or other emergencies are managed by agencies including the Office of Emergency Services, law enforcement, and fire agencies. Emergencies are often fluid events and on-scene emergency personnel provide key information and direction regarding evacuations. The WFEP would be a baseline document, focusing on evacuation routes

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and pre-planning/preparedness. However, actual evacuation procedures would be a case-by-case basis and managed and controlled by the aforementioned agencies.

7.1 Wildfire Education

Proctor Valley Village residents and occupants of commercial facilities would be provided ongoing education regarding wildfire, the WFEP, and this FPP's requirements. This educational information would support the fire safety and evacuation features/plans designed for this community. Informational handouts, community website page, mailers, fire safe council participation, inspections, and seasonal reminders are some methods that would be used to disseminate wildfire and relocation awareness information. SDCFA would review and approve all wildfire educational material/programs before printing and distribution.

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8 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts from multiple projects within a fire agency's jurisdiction, like SDCFA, can cause fire response service decline and must be analyzed. The Proposed Project represents a substantial development that would increase the existing call volume by just under one call per day, on average. The resulting impact of the Proposed Project 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 underutilized on a call volume basis, per an analysis of SDCFA call volume statistics⁴ and has capacity to serve the Proposed Project. When compared to standard utilization rates for busy (five or six calls per day for a rural station) fire stations (Hunt 2010), it is clear there is capacity to serve the Proposed Project.

However, the system needs to be augmented to respond to a population change like that associated with this Proposed Project within a proportional timeframe. The County General Plan's 5-minute travel time standard is one part of the process for determining whether existing fire departments can respond to a project or whether additional resources are necessary. Further, when considered cumulatively with other potential projects planned in the area or within automatic aid response areas, the cumulative impact is considered potentially significant.

Despite the minor 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 SDCFA's primary response area. The largest potential project in addition to the Proposed Project in this portion of SDCFA's jurisdictional area is Otay Resort Village (Village 13), which is pending approvals. Village 13 is anticipated to generate up to 1.8 calls per day and is situated in a portion of the SDCFA that cannot be completely responded to within the County's 5-minute travel time from existing stations. Village 13, like the Proposed Project, has been conditioned to provide a fire station that will meet the General Plan standard and be capable of responding to and assisting with calls beyond the project development, as requested. Based on the Proposed Project and the proposed Village 13 project, SDCFA has committed to realigning resources to better serve the area. Therefore, this portion of the County would have enhanced fire and emergency medical service if one or both projects are approved. These additional stations, if the Village 13 and the Proposed Project are approved and built, would mitigate cumulative impacts associated with the projects along with numerous smaller developments that may occur in the area.

⁴ SDCFA Fire Station 36 currently responds to approximately one call per day (2012 statistics).

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The Proposed Project's contributions to fire resources through building a new public safety center, along with funding for equipment and ongoing operations and maintenance, are expected to enhance SDCFA's response capabilities and enhance the current standards for firefighting and emergency response in this portion of the SDCFA. This fire station would also become part of the regional fire service delivery plan for the SDCFA for this portion of the county and would support fire and emergency service provision in the communities of Jamul, Dulzura, and Otay Mesa. Over the long term, it is anticipated that SDCFA would be able to perform its mission into the future at levels consistent with the County Consolidated Fire Code and the San Diego County General Plan.

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9 CONCLUSION

This FPP has been prepared for the proposed Otay Ranch Village 14 and Planning Areas 16/19. This FPP complies with the requirements of the 2017 County Consolidated Fire Code and the 2016 California Fire and Building Codes. The recommendations in this document meet fire safety, building design elements, infrastructure, fuel management/modification, and landscaping recommendations of the applicable codes. The recommendations provided in this FPP have been designed specifically for the proposed construction of structures within a WUI area.

When properly implemented on an ongoing basis, the fire protection strategies proposed in this FPP should significantly reduce the potential fire threat to vegetation on the community and its structures and should assist the fire authority in responding to emergencies in the Project Area. The Proposed Project's fire protection system includes a redundant layering of protection methods that have been shown through post-fire damage assessments to reduce risk of structural ignition. Modern infrastructure would be provided along with implementation of the latest ignition-resistant construction methods and materials. Further, all structures are required to include interior, automatic fire sprinklers consistent with the fire codes. Fuel modification would occur on perimeter edges adjacent to Otay Ranch RMP/MSCP Preserve and throughout the interior of the Proposed Project. This is a conceptual plan, which provides enough detail for SDCFA approval. Detailed plans such as improvement plans and building permits, demonstrating compliance with the concepts in this FPP and with Fire Code requirements, would be submitted to the fire authority at the time they are developed.

Based on the results of this FPP's analysis and findings, the FPP implementation measures presented in Table 7 summarize code-required measures, and Table 8 summarizes measures offered that are code exceeding or mitigating through alternative means and methods.

Table 7
Code-Required Fire Safety Features

Feature No.	Features Description
1	Ignition-Resistant Construction. Proposed Project buildings would be constructed of ignition-resistant construction materials based on the latest Building and Fire Codes.
2	Interior Fire Sprinklers. All structures over 500 square feet would include interior fire sprinklers.
3	Fuel Modification Zones – Village 14. Provided throughout the perimeter of the Development Footprint and would be up to 120 feet wide in most locations, including the rear yard areas as part of the modified zone. Maintenance would occur as needed, and the HOA would annually hire a third party, SDCFA-approved, FMZ inspector to provide annual certification that it meets the requirements of this FPP.

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Table 7
Code-Required Fire Safety Features

Feature No.	Features Description
4	Fuel Modification Zones – Large Lots. One-acre and larger lots (lots designated as 1, 2, or 3 acres) would include fuel modification equal to 100 feet from all combustible buildings more than 250 square feet. The FMZs would begin at the structure and extend outward in all directions (front, sides, and rear of house). Homeowner's would be responsible for maintaining the FMZs, and they would be included in the annual HOA or approved management entity funded third-party inspections.
5	Roadside Fuel Modification Zones. Roadside FMZs would be consistent with the code for Village 14. FMZ width would be 20 feet on either side of all Proposed Project roads and 10 feet on either side along existing Proctor Valley Road. Planning Areas 16/19 would include 20-foot-wide FMZ except for connecting roads between neighborhoods, which would be 50 feet wide.
6	LBZ. Large lots in Planning Areas 16/19 would include LBZs where the properties are adjacent to open space areas. The LBZs would designate buffer areas where no building would be allowed. If a structure was built adjacent to the LBZ, then the LBZ can be maintained as an FMZ.
7	Fire Apparatus Access. Provided throughout the community and would vary in width and configuration, but would all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.
8	Firefighting Improvements. Firefighting staging areas and temporary refuge areas are available throughout the Proposed Project's developed areas and along roadways and HOA open space.
9	Water Availability. Water capacity and delivery would provide for a reliable water source for operations and during emergencies requiring extended fire flow.
10	Project area Fire Station. Emergency response travel time consistent with the San Diego County General Plan requirement for the Proposed Project would be provided by a Project Area fire station. Travel times to all portions of the Project Area would be within General Plan standards, less than 5 minutes for most of the Proposed Project's developable lots and within 10 minutes for the rural residential lots in Planning Areas 16/19.

Table 8
Code Exceeding or Alternative Materials and Methods Fire Safety Measures

Measure No.	Code Exceeding or Alternative Material or Method Measure
1	Construction Fire Prevention Plan. Details the important construction phase restrictions and fire safety requirements that would be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.
2	Community Evacuation Plan. A Proposed Project-specific evacuation plan would be prepared for the Proposed Project and would include input and review with SDCFA. (Code Exceeding)
3	HOA Wildfire Education and Outreach. The Community HOA would include an outreach and educational role to coordinate with SDCFA, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, and educate residents on and prepare facility-wide "Ready, Set, Go!" plans. (Code Exceeding)

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Table 8
Code Exceeding or Alternative Materials and Methods Fire Safety Measures

Measure No.	Code Exceeding or Alternative Material or Method Measure
4	Heat Deflecting Landscape Walls. Walls would be provided for 38 lots to provide additional fire protection and to enhance structure setback from top of slope. At a few locations, where FMZ is constrained to approximately 70 feet, walls would be provided as mitigation to provide same practical effect. (Alternative materials and methods for FMZ reductions in some locations. Also, a code exceeding measure as it is not required for structure setback.)
5	Fuel Modification Zone Third-Party Inspections. Annual FMZ and LBZ/LDA inspections would be funded by the HOA and conducted by a qualified third-party consultant to certify that the Proposed Project's FMZs are maintained and LBZ/LDA have no authorized structures.
6	Planning Areas 16/19 Roadside Fuel Modification Zones. Roadside FMZs would be 50 feet wide on either side of the road, 30 feet wider than required, where roads traverse open areas with adjacent native fuels. (Code Exceeding)
6	Planning Areas 16/19 Fuel Modification Zone Maintenance Enforcement. The HOA would be responsible for enforcing private property maintenance of large lot FMZs in Planning Areas 16/19. These FMZ areas would also be inspected by the third-party inspector. (Code Exceeding)
87	Trail Maintenance. Provided trails would include ongoing maintenance of flammable vegetation, not including alongside trails. (Code Exceeding)
98	Wider Roads and Driveway Exclusion. In Southern Procter Valley Village, Streets "A" and "M" include wider roads and do not have driveways, enabling free traffic flow and enhanced evacuation capability. (Code Exceeding)

Fire is a dynamic and somewhat unpredictable occurrence, and as such, this FPP does not guarantee that a fire will not occur or will not result in injury, loss of life, or loss of property. There are no warranties, expressed or implied, regarding the suitability or effectiveness of the recommendations and requirements in this FPP, under all circumstances.

The developers, contractors, engineers, and architects would be responsible for proper implementation of the concepts and requirements set forth in this FPP. Homeowners and property managers would be responsible to maintain their structures and lots as required by this FPP, the SDCFA, and as required by the Fire Code. Alternative methods of compliance with this FPP may be submitted to the fire authority and County Fire Marshal for consideration.

It will be extremely important for all homeowners, property managers, and occupants to comply with the recommendations and requirements described and required by this FPP on their property. The responsibility to maintain the fuel modification and fire protection features required for this Proposed Project lies with the homeowners and business owners. The HOA or similar entity would be responsible for ongoing education and maintenance of the common areas, and the fire authority would enforce the vegetation management requirements detailed in this FPP. Such requirements would be made a part of deed encumbrances and CC&Rs for each lot, as appropriate.

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