Crestview Apartments

Draft Environmental Impact Report (DEIR)

Appendix K – Fire Protection Plan

Fire Protection Plan
Crestview Apartments
APN 256-050-012-5
Riverside, California

3 February 2021

Prepared for:
KA Enterprises
5820 Oberlin Drive, Suite 201
San Diego, CA 92660

Certified by:

Mel Johnson, Owner
Certified CEQA Wildland Fire Consultant
FIREWISE 2000 LLC
PO Box 39
Valley Center, CA 92082
760-745-3947

Crestview Apartments
Fire Protection Plan

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Crestview Apartments Project
FIRE PROTECTION PLAN
APN 256-050-012-5
3 February 2021

1.0 GENERAL DESCRIPTION

The proposed Crestview Apartments Project (CAP) is located on undeveloped lands within a high fire hazard zone in the City of Riverside (Image 2 Very High Fire Hazard Severity Zone (VHFHSZ)).
The project consists of the construction of seven (7) multi-family buildings of various sizes, including infrastructure, open space, 428 parking spaces and associated roadways on approximately 9.77 acres.

TOTAL BUILDING FOOTPRINT SQ. FT.

BLDG. NUMBER	BLDG. TYPE	1st FL. SQ. FT.	2nd FL. SQ. FT.	3rd FL. SQ. FT.	4th FL. SQ. FT.	TOTAL SQ. FT.	TYPE OF CONSTRUCTION
1	TYPE Ia	6,968	7,015	7,015	-	20,998	VA
2	TYPE Ia	6,968	7,015	7,015	-	20,998	VA
3	TYPE Ib	7,277	7,324	7,324	-	21,925	VA
4	TYPE Ib	7,277	7,324	7,324	-	21,925	VA
5	TYPE Ia	6,968	7,015	7,015	-	20,998	VA
6	TYPE II	44,566	37,823	42,064	42,055	166,508	VA
7	TYPE III	21,286	19,867	18,087	18,073	77,313	VA
TOTAL	-	101,310	93,383	95,844	60,128	**350,665**	-

Table provides square footage by structure and project footage totals.

1. The project cannot provide for 100 feet of Fuel Treatment and defensible space on site. To reach equivalency thru mitigation the following additional structural protection elements shall be designed and installed during construction. These are in addition to the requirements based in CBC 7A and CRC Sec337.
    - Structures will be compartmentalized with two-hour fire walls as required, to be compliant with a 13R sprinkler system in terms of fire area. Buildings 1, 2, 3, 6, & 7 are still to be protected with a full NFPA 13 sprinkler system as a mitigation measure for construction inside (and adjacent to) the VHFHSZ, within the 100' buffer.
    - In addition, we are proposing that all buildings that are fully within the zone are also to be constructed with two-hour exterior wall assemblies, with the remaining buildings being of the standard one-hour as allowed by code. The left-hand wing of building 6 should also be afforded that same protection, wrapping around the wing within the zone.
    - In summary: Mitigation measures proposed:

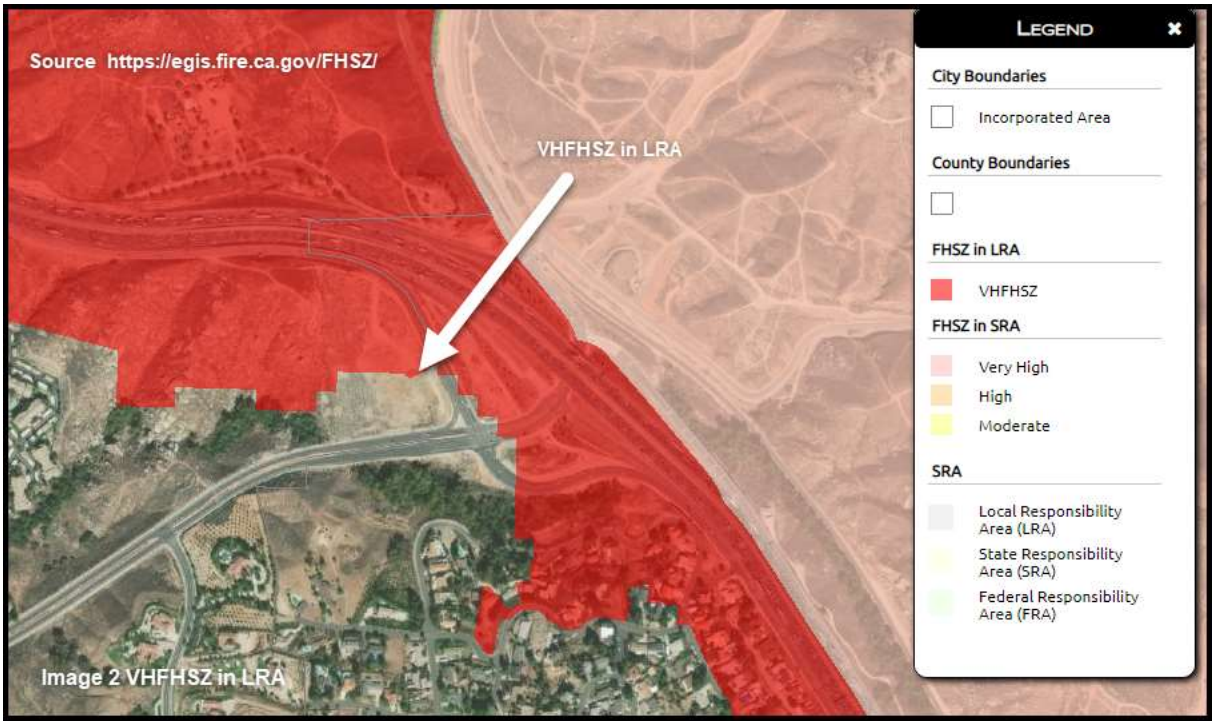
- Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies. (To be clear, not Type III construction with fire retardant-treated lumber, etc., just an approved Type X gypsum board assembly of as discussed)
- Building 6 has the exposed faces and that portion within the VHFHSZ to be wrapped as above.
- All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC, However, buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection.
- Carports within the defensible space area(s) shall be constructed of non-combustible material.

Image 1 on the following page provides structure hardening detail.

Crestview Apartments

KA Enterprises

Fuel Treatment Site Plan


Source https://egis.fire.ca.gov/FHSZ/
VHFHSZ in LRA
LEGEND
City Boundaries
Incorporated Area
County Boundaries
FHSZ in LRA
VHFHSZ
FHSZ in SRA
Very High
High
Moderate
SRA
Local Responsibility Area (LRA)
State Responsibility Area (SRA)
Federal Responsibility Area (FRA)
Image 2 VHFHSZ in LRA

Approximate Center of Project
Photo #1 - Aerial Image of Project Site

The project is bounded by Sycamore Canyon Boulevard/Interstate 215/State Route 60 on the North, Sycamore Canyon Boulevard to the East, Central Avenue to the South, and undeveloped land to the West (Photo #1). Further to the South, out of view, are existing homes (Photo #1). Refer to the attached Fire Protection Plan Map exhibit (Section 10.0) for the illustration of property lines, related fuel treatments and special fire protection construction features.

Prior to any land development within this proposed project, a Fire Protection Plan (FPP) must be submitted to and approved by the City of Riverside Fire Department (RCFD). The FPP assesses the overall (on-site and off-site) wildland fire hazards and risks that may threaten life and property associated with the proposed residential development. In addition, this FPP establishes both short and long-term fuel modifications to minimize any projected fire hazard and risk and assigns annual maintenance responsibilities for each of the recommended fuel modification actions.

1.1 General Information

Developer/Applicant: KA Enterprises
5820 Oberlin Drive, Suite 201
San Diego, CA 92121

Approving Departments:
Fire Authority: City of Riverside Fire Department

The purpose of this FPP is to provide Fuel Modification Zone treatment direction for developers, architects, builders, and City of Riverside Fire Department officials to use in making all proposed structures safe from future wildland fires. Appendices attached to this FPP that provide additional information shall be considered part of this FPP. This FPP includes:

- A wildland fire hazard rating assessment and calculations of the expected fire behavior in the event a wildland fire should occur within the off-site native vegetation.
- A long-term perimeter vegetative fuel modification treatment and maintenance plan to minimize any loss to residential structures within the planned development due to wildland fire.
- Additional construction features, where required, due to high fire hazard wildland fuels.
- Landscaping criteria deployed around all planned structures.
- Building construction and design criteria.
- A review of ignition resistant building features; community protection systems (e.g., water and access); and specifications to assure these plans, features and systems adequately protect life and property.

This FPP is based upon requirements listed in the City of Riverside Fire Code, Chapter 16.32.010, the Wildland-Urban Interface (WUI) Development Standard Guidelines; California Code of Regulations Title 24, Part 9 and Title 14, Section 1280; 2019 California Fire Code and Local Amendments including Appendices to Chapters 1 & 4 and Appendices B, F & H; Chapter 7A-2019 California Building Code; 2019 California Residential Code (CRC) R337; California Government Code, sections 51175 through 51189; California Public Resources

Code Sections 4201 through 4204; the 2019 version of the National Fire Protection Association (NFPA) Standard 13; the City of Riverside Weed Abatement, Declaration of Nuisance 6.15.020, and supporting process.

2.0 WILDLAND FIRE HAZARD AND RISK ASSESSMENT

The CAP is located within an area classified by the RCFD as a Very High Fire Hazard Area. Wildland fire may impact the project as there are wildland fuels within 1000 feet of the project on all sides. The greatest threat comes from the adjacent undeveloped properties and steep terrain. There is potential for wildfire to enter the project primarily from the west thus exposing numerous structures to wildfire convective and radiant heat. All the structures within CAP are subject to embers showers.

2.1 Weather Review and Assessment

Fire agencies throughout the western United States rely on a sophisticated system of Remote Automated Weather Stations (RAWS) to monitor weather conditions and aid in the forecasting of fire danger. Data for all RAWS is archived in the Western Region Climate Center in Reno, Nevada The closest active RAWS to the Crestview Apartments project is the Clark RAWS located at Latitude 33° 52' 36" N and Longitude 117° 18' 32" W at an elevation of 1,720 feet and approximately 5.7 miles from the project. This is approximately 350 feet higher than the Crestview Apartments project site. Winds will tend to be slightly lower within the project as compared to this weather station.

The typical prevailing summer time wind pattern is out of the west/southwest and normally is of a much lower velocity (5-10 MPH with occasional gusts to 20 MPH) and is associated with relative humidity readings ranging between 20% and occasionally more than 70% due to the sites proximity to the ocean. All other (northwest, southeast and south) wind directions may be occasionally strong and gusty; however, they are generally associated with cooler moist air and have higher relative humidity (>40%). They are considered a serious wildland fire weather condition when wind speeds reach >20-MPH.

The most critical weather pattern to the project area is a hot, dry offshore wind, typically called a Santa Ana. Such wind conditions are usually associated with strong (>50 MPH), hot, dry winds with very low (<15%) relative humidity. Santa Ana winds originate over the dry desert land and can occur anytime of the year; however, they generally occur in the late fall (September through November). This is also when non-irrigated vegetation is at its lowest moisture content.

The following illustrations depict the the worst case weather that ***FIREWISE 2000 LLC*** could verify over the last 10 years at the Clark RAWS. Note that when very low humidity occurs simultaneously with strong winds that fire behavior can be profoundly affected.

Ave Relative Humidity

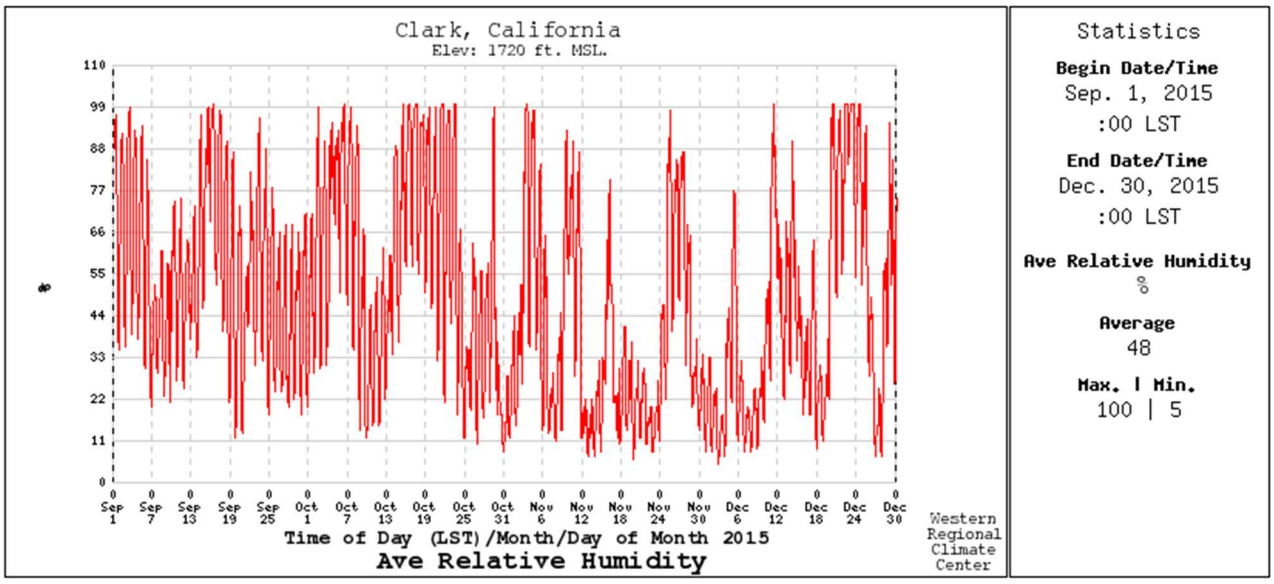


Illustration #2 – Average Relative Humidity for The Clark RAWS. The Lowest Humidity Recorded Was 5 Percent. Note the Average for the Entire 120 Day Period Was 48 Percent with a Low of 5 Percent.

Maximum Wind Gust

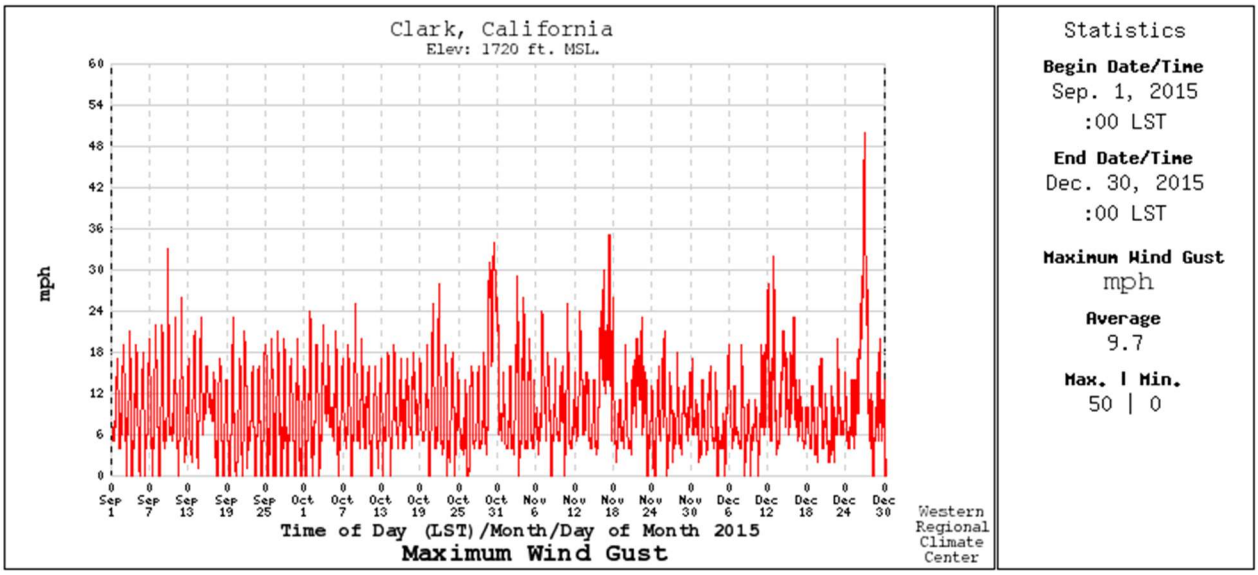


Illustration #3 – Maximum Wind Gust for the Clark RAWS. The Highest Recorded Wind Gust in The Fall of 2015 Was 50 MPH. The Average Wind Gust for the 120 Day Period Was 9.7 MPH.

2.2 Off-Site Fire Hazard and Risk Assessment

The Crestview Apartments property is located south of Sycamore Canyon Boulevard and the Interstate 215/State Route 60 Freeway at the intersection with Central Avenue on the eastern side of the City of Riverside. Residential properties exist to the west and south as shown in Photo #2. The approximate elevation of the project is 1,345 feet. No fire behavior calculations

are presented for the north exposure as the 200 plus foot wide Interstate 60 freeway and Sycamore Canyon Boulevard abuts the project. A small undeveloped property exists between Sycamore Canyon Blvd. and Interstate 60 to the east. South of the property lies Central Avenue and undeveloped lands consisting of oaks, sycamore, a variety of shrub and grass species. The most significant wildfire threat to the project is from the west where the project abuts undeveloped land.

Photo #2 - Looking Northeast toward Sycamore Canyon Boulevard and Interstate 215/State Route 60. The Project abuts the manufactured slope seen below the car. The combination of this Boulevard plus the Interstate 215/State Route 60 free has eliminated nearly all wildland fuels. The primary concern from the north are embers.

Historically, wildland fires have burned in the City of Riverside during moderate west to southwest winds. This moderately strong, dry wind condition that occurs during these fires usually develops in the late afternoon or early evenings. These winds occur during the normal summer and early fall (June through October) months. These winds may blow from 20-30 MPH. The most significant wind pattern that will impact the project is a Santa Ana wind which typically occur in September thru November and in the range of 50-60 MPH within this portion of Riverside County.

Northern Boundary – To the north is Sycamore Canyon Boulevard as shown in Photo #1. A fire starting along the Interstate 215/State Route 60 corridor during a strong Santa Ana wind condition would blow embers directly toward the Development. The combination of the boulevard and freeway results in over 200 feet of nearly a vegetation free landscape. Therefore, no fire behavior calculations area presented.

Photo #3 – Aerial View of the Riparian Area Located on the South Side of Central Avenue. The Yellow Arrow Points to the Project Location. In the Northeast Corner of the Photo is an Undeveloped Area Located Between Sycamore Canyon Blvd. and the Interstate Highway. This Area Could Burn and Impact the Project. See Fire Behavior Table 3.1.1 for the Calculations.

Eastern Boundary Fuels - The eastern boundary (See Photo #3) abuts Sycamore Canyon Blvd. as shown in northeast corner of Photo #4. The current vegetative cover is a combined Fuel Model Sh2 – Moderate Load, Dry Climate Shrub (50%) and Gr2 – Low Load, Dry Climate Grass (50%). The presence of Sycamore Canyon Blvd. is highly important as this

roadway is approximately 70 feet in width. The required irrigated fire-resistant landscape planted along the west side of Sycamore Canyon Blvd. combined with the installation of ignition resistant construction in all the buildings, parking lots, emergency access roadways and the construction requirements found in (Section 7.1) should be more than sufficient to mitigate any threats from wildfire and embers coming from the east.

Photo #4 - Looking South Toward Central Avenue. The Project lies in the foreground beginning at the roadway. The presence of Central Avenue, a roadway that is approximately 100 feet in width will be sufficient to mitigate any wildland fire threat from the south.

Southern Boundary - The southern boundary of the Crestview Apartments abuts undeveloped land which is planned to become Estate Residential Properties in the future as this 101.2-acre parcel is owned by the developers (See Photo #4). The typical fuel model for this southern boundary is a combined Fuel Model FM – sh5, High Load Dry Climate Shrub (50%) and gr4 – Moderate load, dry climate grass (50%). Southwest or West winds of up to 30-MPH may occur along the southern boundary. These "*rare event*" dry winds pose a threat to the structures near the southern project boundary, mostly from embers from a wildland fire occurring to the south in the adjacent undeveloped land. See Table 3.1.3 for calculated fire behavior in untreated and treated fuels. All the wildland fuels will be removed within the

project due to grading and replaced with structures and Zone 1 landscaping. The required fuel treatments, installation of ignition resistant construction, and construction requirements (Section 7.1 thru 7.3) should be more than sufficient to mitigate any threats from radiant heat or direct flame impingement.

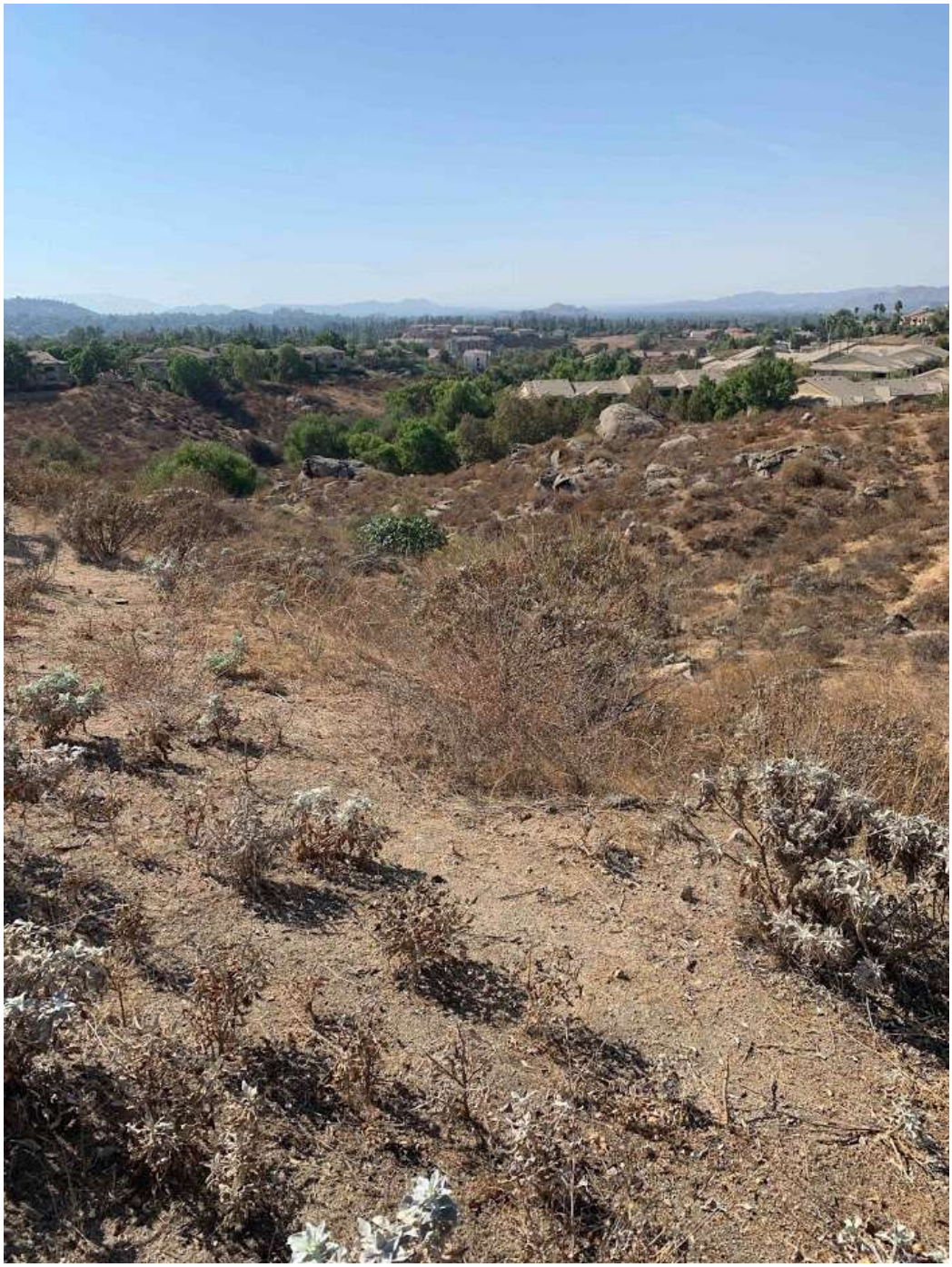


Photo #5 - Looking West Toward the Western Boundary. Note the Continuous Vegetative Cover Until It Reaches the Nearby Development. These Fuels are Best Described as Fuel Model SCAL18 or Sage/Buckwheat.

Western Boundary - The western project boundary is the greatest wildland fire threat to the proposed project. A wildland fire burning west of the project during a "*rare event*" West or Southwest wind could burn with high intensity towards the development. Fuels in the area are light to moderate (see Photo #5). Slopes in the adjacent open space range from 25 – 40%. The project biologist, ELMT Consulting, reported that one of the larger plant communities is disturbed Riversidean Sage Scrub. Within this plant community are grasses which tend to be more common on west facing slopes exposed to the sun.

The current vegetation to the west is not mature due to the recent soil disturbances. There is no large fire history for the project site. See Section 2.4 for additional information. The typical fuel model for this western boundary is a combined Fuel Model Sh2 – Moderate Load, Dry Climate Shrub (50%) and Gr2 – Low Load, Dry Climate Grass (50%).

In the Southwest corner of the project is a small area of riparian vegetation. See Table 3.1.4 for projected fire behavior.

Most of the proposed buildings are located uphill from the expected fire behavior which is a concern. To offset some of this concern is the fact that several parking areas and roadways separate the buildings from the wildland fuels. The building located farther to the west north of the pool is located within 36 feet of the CAP's western property line. The required fuel treatments, installation of ignition resistant construction, and additional construction requirements (Section 7.1) should be sufficient to mitigate any threats from radiant heat or direct flame impingement. The greatest threat will be from embers from a wildfire occurring to the west in the undeveloped wildlands.

2.3 On-site Fire Hazard and Risk Assessment

All the interior fuels will be removed during grading; therefore, there are no wildland fire hazards anticipated within the development once all the fuel modifications are developed as described in Section 6.0 Fuel Modification Zone Descriptions & Required Treatments.

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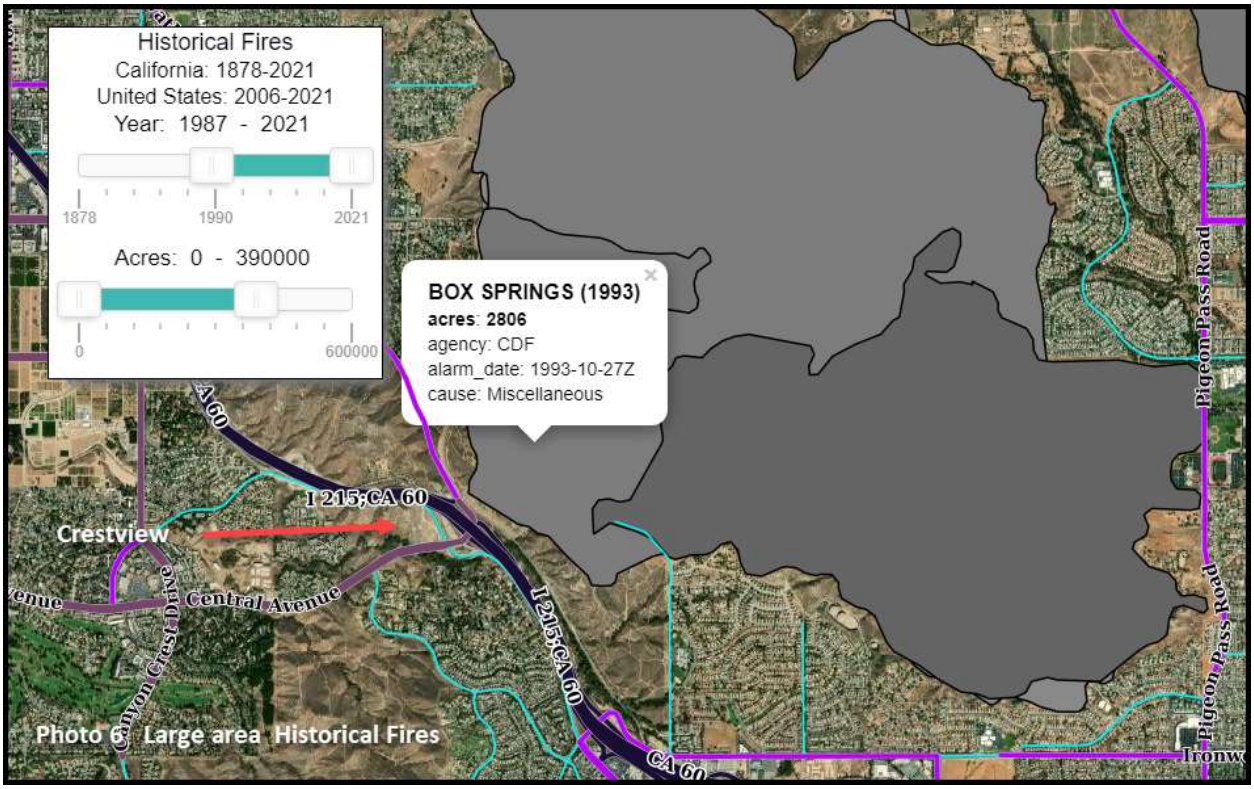
2.4 Fire History

Historical wildland fire activity was also considered in developing this FPP. On the following page is a map showing historical large fire activity on and around the project over the past 100 years. The data for this map was obtained from CalFire. Smaller fires of under 100 ac are seldom maped unless they caused significant damage or loss of life.

It is important to note that most of the large fires have occurred in the hills and mountains located to the north and east of the project. This area is known as Box Springs Mountain Reserve Park.

I was unable to find and verify any fires that may have occurred on the proposed Crestview location. However, the Box Springs Fire would have provided enough ember production to drop in and around the site.



3.0 Predicting Wildland Fire Behavior

The BEHAVE Plus 5.0.5 Fire Behavior Prediction and Fuel Modeling System developed by USDA–Forest Service research scientists Patricia L. Andrews and Collin D. Bevins at the Intermountain Forest Fire Laboratory, Missoula, Montana, is one of the best systematic methods for predicting wildland fire behavior. The BEHAVE Plus fire behavior computer modeling system is utilized by wildland fire experts nationwide.

Wildland fire managers use the BEHAVE Plus modeling system to project the expected fire intensity, rate-of-spread and flame lengths with a reasonable degree of certainty for use in Fire Protection Planning purposes. ***FIREWISE 2000 LLC***. used the BEHAVE Plus 5.0.5 Fire Behavior Prediction Model to make the fire behavior assessments for the Crestview Apartments project discussed below.

3.1 Wildland Fire Behavior Calculations for the Adjacent Hazardous Vegetative Fuels

Wildland fire behavior calculations have been projected for the hazardous vegetative fuels in the undeveloped lands located adjacent to and bordering the proposed Crestview Apartments project. These projections are based on scenarios that are “worst case” Riverside County fire

weather assumptions in the vicinty of the project area. Weather data was obtained from the RAWS (Remote Automatic Weather Station) network stations closest to the project area.

Four scenarios are depicted below in Tables 3.1.1 through 3.1.4. All tables display the expected Rate of Fire Spread (expressed in feet/minute), Fireline Intensity (expressed in btu/ft/s) and Flame Length (expressed in feet) and include the calculation inputs used in the BEHAVE Plus program which were obtained from project site observations and fuel moisture levels typically observed during the local fire season. At the bottom of each table is the Expected Fire Behavior in treated fuels (Zone 2) described in Section 6.2 for the same location.

Table 3.1.1
Fire Scenario #1 - Fire Approaching from the North
(Late Fire Season With 60 MPH North, Northeast Wind Conditions)
Eastern Boundary Fuels

Fire Behavior Calculation Input Data	**Anticipated Fuel Moistures**
• 0 percent slope • 60 mph 20-foot wind speed • 0° aspect from north • 45° wind direction	* 1-Hour Fine Fuel Moisture of.....……...2% * 10-Hour Fuel Moisture of.……...…3% * 100-Hour Fuel Moisture of.....……..…..5% * Live Herbaceous Fuel Moisture of.…...30% * Live Woody Fuel Moisture of…….....50%
Expected Fire Behavior – Combined Fuel Model Sh2 – Moderate Load, Dry Climate Shrub (50%) and Gr2 – Low Load, Dry Climate Grass (50%)	
Rate of Spread - 398.2 ft/min	
Fireline Intensity - 3,337 btu/ft/s	
Flame Length - 18.8 feet	
Expected Fire Behavior in *Treated Fuels* (Zone 2) Combined Fuel Fuel [Model Tl6 – Moderate Load Hardwood Litter (60%) and GR1 Short, Sparce, Dry Climate Grass (40%)]	
Rate of Spread - 141.1 ft/min	
Fireline Intensity - 591.0 BTU/ft/s	
Flame Length - 8.5 feet	

Table 3.1.2 ***Fire Scenario #2 - Fire Approaching from the South or Southwest*** ***(Late Fire Season With 30 MPH Souh or Southwest Wind Conditions)*** **Southern Boundary Fuels**	
Fire Behavior Calculation Input Data • 20 percent slope • 30 mph 20-foot wind speed • 120° aspect from north • 180 ° wind direction	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of…….. 2% * 10-Hour Fuel Moisture of…….. 3% * 100-Hour Fuel Moisture of.....……..…..5% * Live Herbaceous Fuel Moisture of……..30% * Live Woody Fuel Moisture of…….....60%
Expected Fire Behavior - Combined Fuel Model TL6 – Moderate Load Broadleaf Litter (50%) and Sh5 - High Load, Dry Climate Shrub(50%)	
Rate of Spread - 54.6 ft/min	
Fireline Intensity - 3,121 btu/ft/s	
Flame Length - 18.2 feet	
Expected Fire Behavior in *Treated Fuels* (Zone 2) Combined Fuel Fuel [Model Tl6 – Moderate Load Hardwood Litter (60%) and GR1 Short, Sparce, Dry Climate Grass (40%)]	
Rate of Spread - 24.3 ft/min	
Fireline Intensity - 92.0 BTU/ft/s	
Flame Length - 3.6 feet	

Table 3.1.3 ***Fire Scenario #3 - Fire Approaching from the West or Southwest*** ***(Late Fire Season With 30 MPH South, Southwest or West Wind Conditions)*** **Western Boundary Fuels**	
Fire Behavior Calculation Input Data • 35 percent slope • 30 mph 20-foot wind speed • 285° aspect from north • 225 ° S wind direction	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……..2% * 10-Hour Fuel Moisture of……..…3% * 100-Hour Fuel Moisture of.....……..…..5% * Live Herbaceous Fuel Moisture of……..30% * Live Woody Fuel Moisture of…….....60%
Expected Fire Behavior Combined Fuel Model SCAL18 – Sage/Buckwheat (50%) and Gr4 – Moderate Load, Dry Climate Grass (50%)	
Rate of Spread - 424.0 ft/min	
Fireline Intensity - 12,157 btu/ft/s	
Flame Length - 34.1 feet	
Expected Fire Behavior in *Treated Fuels* (Zone 2) Combined Fuel Fuel [Model Tl6 – Moderate Load Hardwood Litter (50%) and GR1 Short, Sparce, Dry Climate Grass (50%)]	
Rate of Spread - 63.8 ft/min	
Fireline Intensity - 225 BTU/ft/s	
Flame Length - 5.4 feet	

Table 3.1.4 *Fire Scenario #3 - Fire Approaching from the South or Southwest* *(Late Fire Season With 30 MPH South, Southwest and West Wind Conditions)* Western Boundary Fuels – Riparian Vegetation	
Fire Behavior Calculation Input Data • 35 percent slope • 30 mph 20-foot wind speed • 285° aspect from north • 225° S wind direction	**Anticipated Fuel Moistures** * 1-Hour Fine Fuel Moisture of……..2% * 10-Hour Fuel Moisture of……..…3% * 100-Hour Fuel Moisture of.....……..…..5% * Live Herbaceous Fuel Moisture of……30% * Live Woody Fuel Moisture of…….....60%
Expected Fire Behavior Combined Fuel Model **Combined Fuel Model [Tl6 – Moderate Load Hardwood Litter (50%) and Sh5 – High Load, Dry Climate Shrub (50%)]**	
Rate of Spread - 63.7 ft/min	
Fireline Intensity - 3,659 btu/ft/s	
Flame Length - 19.6 feet	
Expected Fire Behavior in *Treated Fuels* (Zone 2) **Combined Fuel Fuel [Model Tl6 – Moderate Load Hardwood Litter (50%) and GR1 Short, Sparce, Dry Climate Grass (50%)]**	
Rate of Spread - 22.5 ft/min	
Fireline Intensity - 98 BTU/ft/s	
Flame Length - 3.7 feet	

4.0 Assessing Structure Ignitions in the Wildland/Urban Interface

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

4.1 Firebrands

Firebrands are pieces of burning materials that detach from a burning fuel due to the strong convection drafts in the flaming zone. Firebrands may also be referred to as embers. Firebrands can be carried a long distance (one mile or more) by fire drafts and strong winds. Severe wildland/urban interface fires can produce heavy showers of firebrands. The chance of these firebrands igniting a structure will depend on the number and size of the firebrands, how long they burn after contact and the type of building materials, building design, and construction features incorporated into the structure. Firebrands landing on combustible roofing and decks are common sources for structure ignition. They can also enter a structure through unscreened or poorly screened vents, chimneys, unprotected skylights, and windows.

Even with non-combustible roofing, firebrands landing on leaves, needles, and other combustibles located on a roof (due to a lack of maintenance) can cause structure ignition. Any open windows, doors, or other types of unscreened openings are sources for embers to enter a structure during a wildland fire. If these maintenance issues are addressed on a regular basis, firebrands should not be a concern for the Crestview Apartments as they will be constructed with ignition resistant building materials. (See Section 8 last bullet for maintenance process)

4.2 Radiant Heat/Direct Flame Impingement

Radiation and convection involve the transfer of heat directly from the flame to any exposed surface. Unlike radiation heat transfer, convection requires that the flames or heat column contact the structure. An ignition from radiation (given an exposed flammable surface) heat transfer depends on two aspects of the flame: 1) the radiant heat flux to a combustible surface and, 2) the duration (length of time) of the radiant flux. The radiant heat flux depends on the flame zone size, flame-structure distance, and how much the combustible material of the structure is exposed to the flame. While the flame from a wildfire may approach 1,800 degrees Fahrenheit, it is the duration of heat that is more critical. For an example, a blow torch flame typically approaches 2,100 degrees Fahrenheit, yet a person can easily pass their hand through the flame. Heat duration only becomes critical to a home with a wood exterior surface if the heat is allowed to remain for 30-90 seconds.

Research scientist Jack Cohen of the United States Forest Service has found that a home's or structures characteristics (its exterior materials and design in relation to the immediate area around a home within 100 feet) principally determine the home's ignition potential. He calls the home and its immediate surroundings the 'home ignition zone'. In a study of ignition of wood wallboard, tests by a USDA Forest Service research team described in the Proceedings, 1st International Fire and Materials Conference showed that flame impingement for sufficient length of time (approximately 1 min.) ignites a typical hardboard siding material.

Fire agencies consider fuel treatment as a principal approach to wildland fire hazard reduction. Whenever the flame length is equal to or more than the separation of combustible vegetation from a combustible structure for 1-2 minutes in duration or more, there is a high probability of structure ignition. Contact with a fire's convection heat column also may cause ignition but the temperature of the column's gases is generally not hot enough or long enough in duration to sustain the ignition of the structure.

Comparing the expected wildland fire behavior projections for the western boundary scenario in Table 3.1.3 against the required fuel modification zones outlined in Section 6.0, demonstrates substantial reductions in the expected flame length in treated fuels. By requiring the structures exposed to the threat of wildfire to incorporate the following guidelines, those structures will be provided with the most effective treatment for minimizing losses from flame impingement and associated radiant heat intensities.

- Each structure is constructed of ignition resistant building materials.
- The area surrounding each structure contains an Irrigated Zone (defensible space) and a Thinning Zone (low fuel volume buffer strip) between the Irrigated Zone and the untreated fuels.

The property owner/manager shall be required (see Section 6.0) to maintain the properties to Zone 1 and Zone 2 Fuel Modification standards and shall keep the roof and any rain gutters free of leaves, needles and other combustible debris. All combustible materials must be properly stored away from each structure so that burning embers falling on or near the structure have no suitable host. The Crestview Apartments owners are responsible for maintaining their buildings and for keeping all doors and windows tightly closed whenever a wildland fire is reported in the vicinity. By requiring the structures to be constructed of non-combustible roofing, ignition resistant building materials, and the implementation of required fuel modification will be the most effective treatment for minimizing structure losses due to the projected flame lengths and associated radiant heat intensities.

4.3 Fire Resistant Plant Palette

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

5.0 Fire Department Response Times

The Crestview Apartments project is within the Riverside City Fire Department's (RCFD) 5-minute initial action response time. The closest Fire apparatus is RCFD Canyon Crest Fire Station (1 mile away) located at 725 Central Ave. It would be the first engine to arrive on scene to the furthest structure (3- or 4-minutes driving time depending on traffic). The second engine would be from RCFD Fire Station #13 (2.1 miles away) located 6490 Sycamore Canyon Blvd, approximately 5 minutes driving time to the project. The next closest station is RCFD #9 located at 6674 Alessandro Blvd. This station is 3.6 miles away and approximately 8 minutes from the development. Additional agencies such as Riverside County and nearby cities would also likely respond equipment, but they would probably arrive after RCFD engines were on-scene.

Although the RCFD Canyon Crest Fire Station and Station #13 engines may be generally 3-5 minutes away, there is no assurance that any of the engine companies will be in their stations when a wildfire threatens the Crestview Apartments from an ignition in the adjacent wildlands. Engines may respond from other stations located further away or from other incidents. On high/extreme fire danger days there often may be multiple fire starts and engine companies may be already deployed on other incidents. This is why planned projects use *"defensible space"*, 'Ignition Resistant' building features, and key fuel treatment strategies that enable residents to substantially increase their ability to survive a wildfire on their own and without the loss of any structure. The goal of this FPP, therefore, is to make the Crestview Apartments and its residents and employees as safe as possible and able to survive on their own until firefighting equipment arrives and/or the occupants can be safely evacuated.

6.0 Fuel Modification Zone Descriptions & Required Treatments

- FINAL AS BUILT LANDSCAPING ZONES WILL BE COORDINATED WITH THE CASE PLANNER, CITY OF RIVERSIDE FOR SELECTION OF FIRE RESISTIVE APPROVED LANDSCAPE.

Below are the descriptions and required treatments for the Fuel Modification Zones. All distances in this report are measured horizontally from the exterior of each structure. These distances are depicted on the enclosed Fire Protection Plan Map. Fuel treatment in the Crestview Apartments project will require the minimum City of Riverside fuel treatments of 50-feet of Irrigated Zone 1 including all manufactured slopes located within the project and 30 feet of fuel treatment on either side of each roadway. Thinning Zone 2 is required between 50 and 100 feet of any structure. Should all the fuel treatment not be able to be established, additional fire protection features are required.

The owner/manager will be responsible for maintaining Fuel Modification Zones 1 and 2. In the event the development is repossessed, the person/unit/agency holding title to the project will be responsible for the maintenance. All highly flammable plant species identified in Appendix A shall be permanently removed from the Irrigated Zone 1 and Thinning Zone 2 due to their susceptibility to wildland fire.

6.1 Irrigated Zone 1 - Owner/Manager Maintained *(Shown as* *on the Fire Protection Plan Map)*

Defined

Irrigated Zone 1 is commonly called the defensible space zone and shall be free of all combustible construction and materials. It includes the entire area around each structure(s) (front, back and side yards) and that is located within 50 feet of a structure, on all manufactured slopes, within 30 feet of a roadway and common areas located within the project. It is measured from the exterior wall of each structure or from the most distal point of a combustible projection, an attached accessory structure, or an accessory structure within 10 feet of a structure. It provides the best protection against the high radiant heat produced by wildfire. It also provides a generally open area in which fire suppression forces can operate during wildfire events. This zone includes a level or level-graded area around each structure, primarily used for parking. Containerized plants located in Zone 1 shall also meet the requirements of this Section.

Required Landscaping

- Plants in this zone shall be fire resistant and shall not include any pyrophytes that are high in oils and resins such as pines, eucalyptus, cedar, cypress or juniper species. Thick, succulent or leathery leaf species with high moisture content are the most 'fire resistant'. Refer to APPENDIX 'A' for the Prohibited Plant list.
- Zone 1 shall be cleared of all fire prone and prohibited plant species (see APPENDIX 'A').
- Landscape designs using hardscape features such as driveways, swimming pools, concrete, rock, pavers, and similar non-combustible features to break up fuel continuity within Zone 1 are encouraged.

- All Landscaping will be fire resistive. Landscaping elements will be coordinated with the Case Planner through Landscape and Irrigation Design Review.

Required Maintenance

- Maintenance shall be year round by the owner as required by this FPP or the RCFD.
- Remove and replace any dead or dying plant material monthly.
- Native annual and perennial grasses will be allowed to grow and produce seed during the winter and spring. As grasses begin to cure (dry out), they shall be cut to four inches or less in height.
- Trees shall be maintained to a minimum of six feet of vertical separation from low growing, irrigated vegetation beneath the canopy of each tree.
  All trees must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance —Standard Practices (Pruning)]* (see (http://tcia.org/business/ansi-a300-standards).

6.2 Thinning Zone 2 – Owner/Manager Maintained (*Shown as* *on the Fuel Modificatio Plan Map).*

Zone 2 is the area 50-to-100 feet away from any structure. Fuel treatment shall include the removal of 50 percent of the above ground vegetation including the designated fire prone species found in APPENDIX A. Root systems are to be retained to protect the hillsides from erosion. This zone includes single or small clusters of trimmed fire resistant native and ornamental plants, up to 48 inches in height, and trimmed native or ornamental trees limbed up 6 feet from the ground.

Mulches, chips, and other small multi-cuttings (cut to less than 2 inches in diameter and 4 inches in length) should be evenly spread over the area to prevent grass and weed encroachment within the treated areas. This mulching concept helps to maintain soil moisture, helps reduce soil erosion and reduces weed growth. Mulch shall not exceed 4 inches in depth. All native grasses or weeds are to be mowed or weed-whipped to a 4-inch stubble height.

Required Landscaping

- Thinning the native vegetation to a point where 50% open space is created.
- All native grasses or weeds are to be mowed or weed-whipped to a 4-inch stubble height by June 15th or earlier if they dry out earlier.
- Removal of all dead, woody debris, and exotic or native flammable vegetation (see APPENDIX 'A')
- Allowances for the needs of protected species and habitats will be considered in this zone.
- No combustible construction or materials are allowed in Zone 2.

Required Maintenance

- Annually maintain all tree crowns to keep a separation of six feet between the ground fuels (shrubs and ground covers) and the lower limbs. All trees must be maintained to the current ANSI A300 standards [*Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)]* (see https://www.tcia.org/TCIA/BUSINESS/A300_Standards/Part_1.aspx.

- Annually prune vegetation (see APPENDIX 'B') to maintain a 50% thinning from the original vegetation cover. Selected native plant clusters must be separated by at least 1 ½ times the fully developed height of the retained plants.
- Annually, native annual and perennial grasses will be allowed to grow and produce seed during the winter and spring. As grasses begin to cure (dry out), they shall be cut, in accordance with Riverside City Ordinance 6.15.020, and to comply with California Fire Code, Section 304 Combustible Waste Material.
- Annually remove all dead and dying vegetation and highly flammable exotic species (see APPENDIX 'B') each year or when the fuels become cured, whichever occurs first.
- Any vegetative biomass (debris and trimmings) produced by thinning and pruning shall be removed from the site or converted to mulch by course chipping or multi-cut into 4 inch lengths and evenly distributed to a maximum depth of four (4) inches.
- Mulches, chips, and other small multi-cuttings (cut to less than two (2) inches in diameter and four (4) inches in length) should be evenly spread over the area to prevent grass and weed encroachment within the treated areas. This mulching concept helps to maintain soil moisture for the designated plants, reduces the growth of annual grass, minimizes soil erosion, and recycles plant residue thus reducing disposal cost.

6.3 Zone Markers – Owner/Manager Maintained

All exterior boundaries on the east side of the project with Zone 2 abutting wildland fuels shall be permanently marked on the ground where it transitions to wildland fuels for the purpose of guiding annual fuel treatment maintenance and inspection operations. The most reliable markers are steel fence posts with a baked on painted finish. These Fuel Modification Zone markers must be spaced not more than 100 feet apart so that the markers on each side of an installed marker can be seen from that marker. (See APPENDIX 'F' for an example).

7.0 Construction Standards

- All Crestview Apartments shall be considered within the Very High Fire Hazard Severity Zone (VHFHSZ) and shall be designed and built-in accordance with Chapter 7A (Materials and Construction Methods for Exterior Wildfire Exposure) of the 2019 California Building Code. To include local code amendments. For a description of the current construction requirements as of the date of this report see APPENDIX 'E'.
- All construction and ignition resistant requirements shall meet the 2019 version of the California Fire Code, including amendments, and related Ordinances. The fire protection features described herein shall be maintained to their equivalent or greater ignition resistance in perpetuity.

- All non-habitable accessory structures such as decks, balconies, patio covers, gazebos and fences shall be built from non-combustible materials. The owner/manager is not restricted from having concrete/brick patios, or walkways within the Fuel Modification Zones in compliance with other codes. Refer to APPENDIX 'D' for photos and descriptions of non-combustible decks, patio covers, and railings for these non-habitable accessory structures.

Construction or building permits shall not be issued until the fire code official inspects and approves required fire apparatus access and water supply for the construction site.

7.1 Conditions To Be Met

Prior to the delivery of combustible building construction materials to the project site the following conditions shall be completed to the satisifaction of the RCFD:

- Water and power utilities shall be installed and approved by the appropriate inspecting department or agency.
- Approved Fuel Modification Zones 1 & 2 treatments (100 feet from any sturucture) shall be provided prior to combustible material arriving on the site and shall be maintained throughout the duration of construction.
- Zone 1 shall be cleared of all vegetation prior to construction and subsequently planted to the requirments stated in Section 6.1 after construction is completed.

7.2 Additional Construction Requirements

Adequate irrigated space exists to provide a level of safety with regard to radiant heat. Southerly area's will not be exposed to an offshore wind event.

- Structures will be compartmentalized with two-hour fire walls as required, to be compliant with a 13R sprinkler system in terms of fire area. Buildings 1, 2, 3, 6, & 7 are still to be protected with a full NFPA 13 sprinkler system as a mitigation measure for construction inside (and adjacent to) the VHFHSZ, within the 100' buffer.
- In addition, we are proposing that all buildings that are fully within the zone are also to be constructed with two-hour exterior wall assemblies, with the remaining buildings being of the standard one-hour as allowed by code. The left-hand wing of building 6 should also be afforded that same protection, wrapping around the wing within the zone.
- In summary: Mitigation measures proposed:
- Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies. (To be clear, not Type III construction with fire retardant-treated lumber, etc., just an approved Type X gypsum board assembly of as discussed)
- Building 6 has the exposed faces and those portion within the VHFHSZ are to be wrapped as above.
- All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC, However, buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection.
- Carports within the defensible space area(s) shall be constructed of non-combustible material.

This rating can be achieved by conforming to a 2-hour construction assembly as shown in Gypsum Association Fire Resistance Design Manual.

Fire Protection Plan Exhibit provides location detail.

7.3 City of Riverside AM&M Application

Distribution
0 Owner
0 Petitioner
0 Plan Reviewer
0 Inspection
0 Fire Prevention

City of Riverside Fire Department

Application for Alternate Materials & Methods Of Design and Construction

Project Address: NW of Sycamore and Central, Riverside Crestview Apartments Apn: 256-050-012-5		Plan Check #:
Petitioner: (Print Name): Eugene Marini Relation to the project: (check one) O Architect of Record O Engineer of Record O Designer of Record ● Owner O Contractor **Street Address:** KA Enterprises 5820 Oberlin Drive, Suite 201 San Diego, CA 92121 Daytime Phone: (619)820-6180	Structure Information: Use: Multifamily Occupancy Class: R2/U/B/A3 Construction Type: VA-1-hour w/ 2-hour exterior wall assemblies as per the attached description at Buildings 1,2,3,6, &,7 No. of Stories: 2,3&4 stories Fire Sprinklered? Yes	Architect/Engineer Seal & Signature: LICENSED ARCHITECT R.C. ALLEY III C22598 REN. 05-2021 STATE OF CALIFORNIA
Email: (Please print) eugene@kaenterprises.net	Alternate Contact Name and Phone Number: Serafin Maranan (714) 308-0092	

REQUEST: Provide a brief description of the proposed modification or the alternate material or method being proposed. (You may attach additional document if necessary but this section must be completed)

See Attached document.

The AM & M exhibits as indicated and attached here have been coordinated and is now included in the FPP.

Code Section(s): see attached for code sections	**Issue(s):** see attachment for relevant issues

JUSTIFICATION: Explain how the proposed modification or alternate meets the intent of the applicable code sections while maintaining equivalent protection in suitability, strength, effectiveness, fire resistance, durability, safety, and sanitation (as applicable). Include any relevant practical difficulties for strict compliance. (You may attach additional documentation if necessary but this section must be completed)

This project will comply with CBC Chapter 7A and further mitigations are proposed per the attachment.

Petitioner's Signature:	Title: Acquisitions / Asset MGR	**Date:** 9/25/2020

Project Address: Crestview Apartment Project - APN 256-050-012-5 /NW of Sycamore Cyn. Blvd/Central Ave.	**Plan Check Number:** N/A

FOR STAFF USE ONLY

Assigned to :	**Project Status:**	**Staff Recommendation:**
Staff Signature: Michelle Douglas Michelle Douglas **Date:** 2/3/21	☐ Preliminary Design ☒ Plan Review ☐ Under Construction ☐ Construction Complete	☐ Approve Request as Stated ☒ Approve Request with Conditions ☐ Deny Request as Stated

Fire Department Staff Comments:

The proposed apartment project has been identified in the Very High Fire Severity Zone (VHFSZ). Due to the deficiency of the 100' defensible space as required by the Ca. Fire Code, Section 4607 the following proposed mitigation measures shall be provided for the same practical effect as required by Title14 CCR Section 1299.05: Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies;Building 6 has the exposed faces and that portion within the VHFHS to be wrapped as Buildings 1, 2, 3, & 7; All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC, However, buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection; Carports within the defensible space area(s) shall be constructed of non-combustible material.

Fire Department Conditions of Approval/Reasons for Denial:

Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies;

Building 6 has the exposed faces and that portion within the VHFHS to be wrapped as Buildings 1, 2, 3, & 7;

All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC.

Buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection;

Carports within the defensible space area(s) shall be constructed of non-combustible material.

Determination of Fire Marshal: Jennifer McDowell Authorized Signature **Date:** 2/3/2021	☐ Approve Request as Stated ☒ Approve Request with Conditions ☐ Deny Request as Stated

Fire Protection Conditions of Approval/Reasons for Denial:

A full NFPA 13 sprinkler system to be provided for buildings 1, 2, 3, 6, & 7.

Building 4 & 5 shall be installed with the required standard NFPA 13R fire sprinkler system

144 N. Orange Street, Orange, CA 92866 T 714.639.9860 aoarchitects.com

Architecture. Design. Relationships.

City Riverside
Fire Department
3900 Main Street, 3rd floor
Riverside, CA 92522

RE: Crestview Apts – NW Sycamore & Central, Riverside, CA

We have provided the requested full fire area analysis as discussed to identify the type of construction, building/ fire areas per building, and allowable areas as per CBC.

We will be complying with CBC Chapter 7A, because it is within and adjacent to a Very High Fire Hazard Severity Zone.

CBC Chapter 7A is in place to deal with construction of structures within and adjacent to the Wildland-Urban Interface. As such, in addition to local requirements and other provisions of the code, we propose the project to be constructed as follows in order to construct within and adjacent to the wildland-urban interface:

- Ignition-Resistant Construction shall be comply with CBC Section 704A. Roofing shall comply with CBC Section 705A.
- Vents shall comply with CBC Section 706A.
- Exterior Coverings shall comply with CBC Section 707A.
- Exterior Windows, Skylights, and Doors shall comply with CBC Section 708A. Decking shall comply with CBC Section 709A.
- Accessory Structures shall comply with CBC Section 710A.

However, additional mitigation measures are required per our discussions with Riverside Fire Department. Mitigation measures proposed:

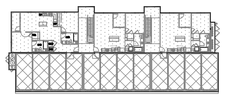
- Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies. (To be clear, not Type III construction with fire retardant-treated lumber, etc., just an approved gyp. board assembly as discussed)
- Building 6 has the exposed faces and that portion within the VHFHSZ to be wrapped as above.
- All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC, However, buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection.
- Carports within the defensible space area(s) shall be constructed of non-combustible material.

Sincerely,

Serafin Maranan, Principal - AO

Level 3

Level 2



Level 1

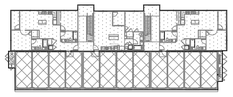
Building Type I-a

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

	Location	Design Option Utilized	Areas	Occupancy Classification R-2	Occupancy Classification U	Sum of Ratios Per Section 508.4.2
						In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Building Type I-a	Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	3,569	3,399	
			Allowable Area	19200	14400	.422
			Sub Total	.186	.236	
	Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7015		
			Allowable Area	19,200		.365
			Sub Total	.365		
	Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7,015		
			Allowable Area	19,200		.365
			Sub Total	.365		
The Total Building Area shall not exceed 2 Per Section 506.2.4						1.153

Level 3

Level 2



Level 1

Building Type I-b

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

	Location	Design Option Utilized	Areas	Occupancy Classification R-2	Occupancy Classification U	Sum of Ratios Per Section 508.4.2
						In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Building Type I-b	Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	3818	3459	
			Allowable Area	19200	14400	.439
			Sub Total	.199	.240	
	Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7324		
			Allowable Area	19,200		.381
			Sub Total	.381		
	Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7324		
			Allowable Area	19,200		.381
			Sub Total	.381		
The Total Building Area shall not exceed 2 Per Section 506.2.4						1.202

Building Area Notes

Building area limitations shown in square feet, as determined by the definition of "Area, building," per story.

#	Code Reference	Notes
1.	Section 311.1.1	Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3 m2) in area and accessory to another occupancy shall be classified as part of that occupancy. The aggregate area of such rooms or spaces shall not exceed the allowable area limits of Section 508.2.
2.	Section 503.1	For the purpose of determining allowable area, each portion of a building separated by Fire Walls shall be considered to be a separate building.
3.	Section 503.1.2	The provisions for Buildings on the same lot are not applicable.
4.	Section 506.2	The floor area of a building shall be determined in accordance with Sections 506.2.1 through 506.2.4 and Section 506.3. A. See 'Allowable Area And Building Area Modifications' for allowable areas by fire area.
5.	Section 506.3	Every building shall adjoin or have access to a public way to receive an area factor increase based on frontage. A. See 'Frontage Increase' table for frontage increases by fire area.
5.	Section 506.2.3 Section 508.2.3 Section 508.3.2 Section 508.4.2	Determine allowable areas permitted for each story and for the total building if: **(M)** Mixed-Occupancy, multistory buildings **(MA)** Mixed-Occupancy with Accessory occupancies **(MN)** Mixed-Occupancy, Non-Separated **(MS)** Mixed-Occupancy, Separated A. See 'Allowable Area And Building Area Modifications' for Total Building Areas. B. See 'Fire Area Diagrams' for design option used and for Total Building Areas by Level.
6.	Section 508.2.3	Allowable building area. The allowable area of the building shall be based on the applicable provisions of Section 506 for the main occupancy of the building. Aggregate Accessory Occupancies shall not occupy more than 10 percent of the building area in the story in which they are located. A. See 'Fire Area Diagrams' for Accessory Occupancy percentage calculations.
7.	Section 508.3	The Provisions for Non-Separated Occupancies are not applicable.
8.	Section 508.4.2	Allowable building area for Mixed-Occupancies, Separated. In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed 1. See 'Area Ratio Calculations For Mixed/Separated and Accessory Occupancies' on this sheet for Area Ratio Calculations.

Building Data

Building Type	Type of Construction	No. of Stories	Use/ Occupancy	Type of Sprinklers (Not for Area Increase)	Allowable Height / Stories
I-a	VA	2	R2/ U	NFPA 13	60' / 4
I-b	VA	2	R2/ U	NFPA 13	60' / 4
II	VA	4	R2/ U	NFPA 13	60' / 4
III	VA	4	R2/ U	NFPA 13	60' / 4

Applicable Codes

2019 California Building Code, Part 2 (Based on 2015 IBC)
2019 California Electrical Code, Part 3 (Based on 2014 NEC)
2019 California Mechanical Code, Part 4 (Based on 2015 UMC)
2019 California Plumbing Code, Part 5 (Based on 2015 IPC)
2019 California Energy Code, Part 6
2019 California Fire Code, Part 9 (Based on 2015 IFC)
2019 California Green Building Standards Code
California Code of Regulations - Title 24
2010 ADA Standards for Accessible Design (Applies to Public Spaces)
1988 FHADM & ANSI A117.1 (Applies to Tenant Common Use Spaces)
1988 FHADM (Applies to Tenant Covered Dwelling Units)

Fire Area Calculations And Building Area Modifications

Mixed-Occupancy, Multistory Buildings Per Section 506.2.4. Aa = [At + (NS x If)]

Fire Area	Occupancy Classification	Tabular Allowable Area Factor Per Table 506.2 (Square Feet)	Tabular Allowable Area Factor For A Non-Sprinklered Building Per Table 506.2 (Square Feet)	Area Increase Due To Frontage (Factor)	Frontage Increase Per Section 506.3 (Square Feet)	Total Allowable Area Per Story (Square Feet)
		At	NS	If	NS x If / 100	Aa
Building Type I-a	R-2	12000	12000	60	7200	19,200
	U	9000	9000	60	5400	14,400
Building Type I-b	R-2	12000	12000	60	7200	19,200
	U	9000	9000	60	5400	14,400
Building Type II Fire Area 1	R-2	12000	12000	48	5778	17,778
	A-3	11500	11500	48	5537	17,037
	U	9000	9000	48	4333	13,333
Building Type II Fire Area 2	R-2	12000	12000	47	5624	17,624
	U	9000	9000	47	4218	13,218
Building Type II Fire Area 3	R-2	12000	12000	48	5778	17,778
	U	9000	9000	48	4333	13,333
Building Type II Fire Area 4	R-2	12000	12000	47	5624	17,624
	U	11500	9000	47	4218	15,718
Building Type II Fire Area 5	R-2	12000	12000	47	5624	17,624
	U	9000	9000	47	4218	13,218
Building Type III Fire Area 1	R-2	12000	12000	59	7133	19,133
	B	18000	18000	59	10700	28,700
	U	9000	9000	59	5350	14,350
Building Type III Fire Area 2	R-2	12000	12000	50	6029	18,029
	U	9000	9000	50	4522	13,522
Building Type III Fire Area 3	R-2	12000	12000	26	3175	15,175
Building Type II Fire Area 6	R-2	12000	12000	50	6029	18,029
	U	9000	9000	50	4522	13,522

Frontage Increase

If = 100[(F / P) - 0.25] (W / 30)

Fire Area	Building Perimeter That Fronts On A Public Way Or Open Space Having 20 Feet Open Minimum Width (Feet)	Perimeter of Entire Building (Feet)	Minimum Frontage Distance Per Section 506.3.2 (Feet)	Area Increase Due To Frontage (Factor)
	F	P	W	If
Building Type I-a	391'-7"	391'-7"	24	60
Building Type I-b	403'-4"	403'-4"	24	60
Building Type II - Area 1	358'-10"	468'-6"	28	48
Building Type II - Area 2	339'-0"	450'-9"	28	47
Building Type II - Area 3	244'-10"	358'-8"	24	48
Building Type II - Area 4	333'-1"	457'-1"	28	45
Building Type II - Area 5	355'-9"	409'-2"	24	48
Building Type III - Fire Area 1	401'-7"	452'-10"	28	59
Building Type III - Fire Area 2	454'-7"	576'-7"	28	50
Building Type III - Fire Area 3	151'-10"	234'-8"	20	26
Building Type II - Area 6	265'-8"	306'-11"	24	50

Fire Resistance Design Data

BUILDING ELEMENT	CODE REFERENCE	FIRE-RESISTANCE RATING REQUIREMENT (HOURS)
PRIMARY STRUCTURAL FRAME (SEE SECTION 202):	CBC TABLE 601	ONE HOUR
BEARING WALLS, EXTERIOR:	CBC TABLE 601, 602.2, 704.10 AND 705	ONE HOUR
BEARING WALLS, INTERIOR:	CBC TABLE 601, 602.2, 704.10 AND 705	ONE HOUR
NON-BEARING WALLS AND PARTITIONS, EXTERIOR:	CBC TABLE 601	ONE HOUR
NON-BEARING WALLS AND PARTITIONS, INTERIOR:	CBC TABLE 601 AND 714.4.1.2, EXCEPTION 7	NON-RATED TYPICAL, ONE HOUR RATED PER 714.4.1.2, EXCEPTION 7
FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS:	CBC TABLE 601	ONE HOUR
ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS:	CBC TABLE 601	ONE HOUR
FIRE WALLS:	CBC 706	TWO HOUR
FIRE BARRIERS:	CBC 707 AND 707.3.1	ONE HOUR (TWO HOUR SHAFTS)
FIRE PARTITIONS / SEPARATION WALLS:	CBC 420.2	ONE HOUR
HORIZONTAL SEPARATION / HORIZONTAL ASSEMBLIES:	CBC 420.3	ONE HOUR
PENETRATIONS OF FIRE-RATED ASSEMBLIES:	CBC 714	VARIES (EQUAL TO FIRE-RESISTANCE RATING OF ASSEMBLY)
OPENINGS BASED ON FIRE SEPARATION DISTANCE:	PER CBC TABLE 705.8 AND 705.8.1, #2	UNLIMITED, U.N.O.
CORRIDORS	CBC TABLE 1020.1	ONE HOUR

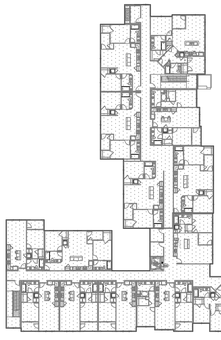
NOTE: SEE BUILDING COMPOSITE PLANS, CONSTRUCTION NOTES AND FIRE ASSEMBLY DETAILS FOR ADDITIONAL INFORMATION.

Fire Area Plan Legend

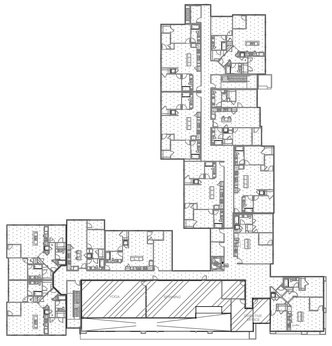
R-2 OCCUPANCY (DWELLING UNITS)

U OCCUPANCY (STORAGE/ UTILITY)

A3/B OCCUPANCY (AMENITY SPACES)



Level 4



Level 2

Building Type III - Fire Area 1

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

	Location	Design Option Utilized	Areas	Occupancy Classification R-2	Occupancy Classification U	Occupancy Classification B	Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Building Type III - Fire Area 1	Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	3731	1119	5,194	
			Allowable Area	19133	14350	28700	.454
			Sub Total	.195	.078	.181	
	Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5875		2,835	
			Allowable Area	19,133		28,700	.406
			Sub Total	.307		.099	
	Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	9555		-	
			Allowable Area	19,133		-	.499
			Sub Total	.499		-	
	Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	9555		-	
			Allowable Area	19,133		-	.499
			Sub Total	.499		-	
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.859

Building Type III - Fire Area 2

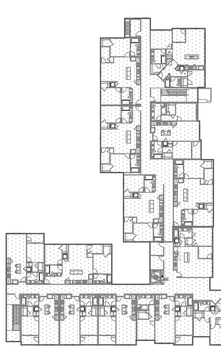
Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

	Location	Design Option Utilized	Areas	Occupancy Classification R-2	Occupancy Classification U	Sum of Ratios Per Section 508.4.2
						In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Building Type III - Fire Area 2	Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	4864	3,742	
			Allowable Area	18029	13522	.546
			Sub Total	.270	.277	
	Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	8519		
			Allowable Area	18,029		.473
			Sub Total	.473		
	Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	8532		
			Allowable Area	18,029		.473
			Sub Total	.473		
	Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	8518		
			Allowable Area	18,029		.472
			Sub Total	.472		
The Total Building Area shall not exceed 2 Per Section 506.2.4						1.965

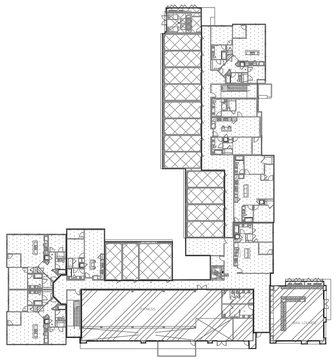
Building Type III - Fire Area 3

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

	Location	Design Option Utilized	Areas	R2	Sum of Ratios Per Section 508.4.2
Building Type III - Fire Area 3	Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	2636	
			Allowable Area	15175	.174
			Sub Total	.174	
	Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	2638	
			Allowable Area	15,175	.174
			Sub Total	.174	



Level 3



Level 1

Building Type III

Fire Area Diagrams

CRESTVIEW APARTMENTS

RIVERSIDE CA

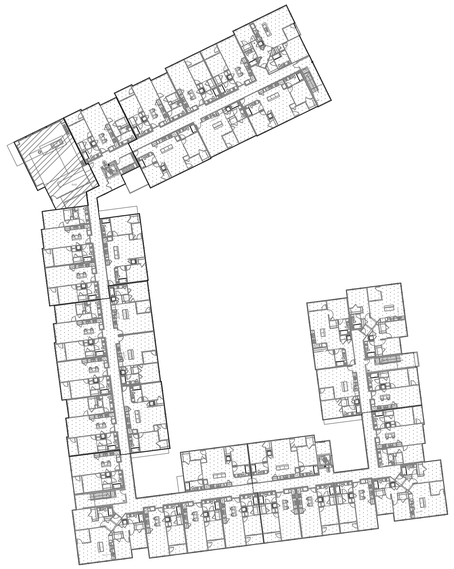
FIRE AREA ANALYSIS - BLDG TYPE I-a, I-b & II

DATE: 12-22-2020
JOB NO.: 2018-549

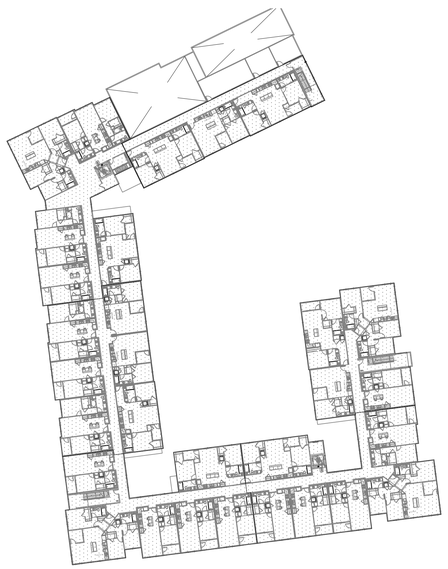
KA ENTERPRISES
5820 OBERLIN DRIVE SUITE 201, RIVERSIDE CA 92121
(858) 404-6080

ARCHITECTS ORANGE
144 NORTH ORANGE ST., ORANGE, CA 92866
(714) 639-9860

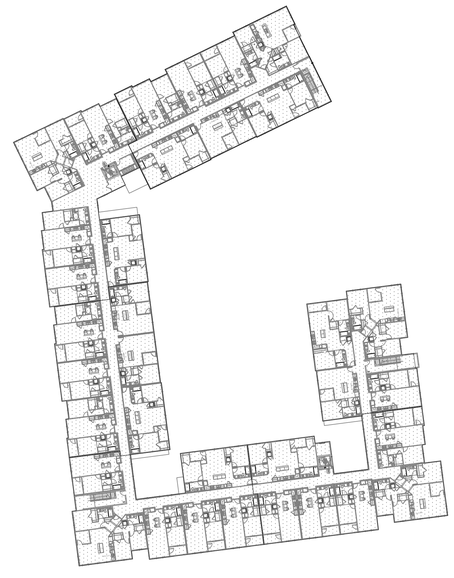
ARCHITECTS ORANGE



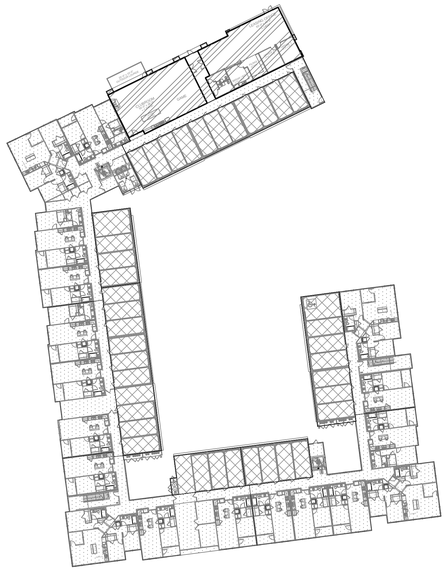
Level 4



Level 2



Level 3



Level 1

Fire Area Diagrams - Building Type II

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 1

Location	Design Option Utilized	Areas	Occupancy Classification R-2		Occupancy Classification U		Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	6221		2,157 SQ. FT.		.516
		Allowable Area	17624		13218		
		Sub Total	.353		.163		
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7403		-		.420
		Allowable Area	17,624		-		
		Sub Total	.420		-		
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7403		-		.420
		Allowable Area	17,624		-		
		Sub Total	.420		-		
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7403		-		.420
		Allowable Area	17,624		-		
		Sub Total	.420		-		
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.776

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 2

Location	Design Option Utilized	Areas	Occupancy Classification R-2		Occupancy Classification U		Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5964		3,957		.638
		Allowable Area	17624		13218		
		Sub Total	.338		.299		
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7132		-		.405
		Allowable Area	17,624		-		
		Sub Total	.405		-		
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7132		-		.405
		Allowable Area	17,624		-		
		Sub Total	.405		-		
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7132		-		.405
		Allowable Area	17,624		-		
		Sub Total	.405		-		
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.852

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 3

Location	Design Option Utilized	Areas	Occupancy Classification R-2		Occupancy Classification U		Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	3834		1246		.309
		Allowable Area	17778		13333		
		Sub Total	.216		.093		
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	6725		-		.378
		Allowable Area	17,778		-		
		Sub Total	.378		-		
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	6725		-		.378
		Allowable Area	17,778		-		
		Sub Total	.378		-		
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	6731		-		.379
		Allowable Area	17,778		-		
		Sub Total	.379		-		
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.444

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 4

Location	Design Option Utilized	Areas	Occupancy Classification R-2		Occupancy Classification U		Occupancy Classification A-3	Sum of Ratios Per Section 508.4.2
								In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	6303		1246	-		.448
		Allowable Area	17778		13333	-		
		Sub Total	.355		.093	-		
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7314		-	-		.411
		Allowable Area	17,778		-	-		
		Sub Total	.411		-	-		
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	7307		-	-		.411
		Allowable Area	17,778		-	-		
		Sub Total	.411		-	-		
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5432		-	1860		.467
		Allowable Area	17,778		-	11500		
		Sub Total	.306		-	.162		
The Total Building Area shall not exceed 2 Per Section 506.2.4								1.738

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 5

Location	Design Option Utilized	Areas	Occupancy Classification R-2	B	Occupancy Classification U	Occupancy Classification A-3	Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	1,099	-	3,078 SQ. FT.	4,306	.546
		Allowable Area	17624	-	13333	17037	
		Sub Total	.062	-	.231	.253	
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	4,249	-	-	-	.241
		Allowable Area	17,624	-	-	-	
		Sub Total	.241	-	-	-	
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	8,497	-	-	-	.482
		Allowable Area	17,624	-	-	-	
		Sub Total	.482	-	-	-	
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	8,497	-	-	-	.482
		Allowable Area	17,624	-	-	-	
		Sub Total	.482	-	-	-	
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.751

Area Ratio Calculations For Mixed/Separated and Accessory Occupancies

Building Type II Fire Area 6

Location	Design Option Utilized	Areas	Occupancy Classification R-2		Occupancy Classification U		Sum of Ratios Per Section 508.4.2
							In Each Story The Sum of The Ratios of The Actual Building Area of Each Separated Occupancy Divided By The Allowable Area of Each Separated Occupancy Shall Not Exceed 1
Level 1	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	2998		2157		.330
		Allowable Area	17778		13333		
		Sub Total	.169		.162		
Level 2	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5000		-		.281
		Allowable Area	17,778		-		
		Sub Total	.281		-		
Level 3	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5000		-		.281
		Allowable Area	17,778		-		
		Sub Total	.281		-		
Level 4	Mixed-Occupancy w/ Separated Occupancies Per Section 508.4	Actual Area	5000		-		.281
		Allowable Area	17,778		-		
		Sub Total	.281		-		
The Total Building Area shall not exceed 2 Per Section 506.2.4							1.174

Fire Area Plan Legend

	R-2 OCCUPANCY (DWELLING UNITS)
	U OCCUPANCY (STORAGE/ UTILITY)
	A3/B OCCUPANCY (AMENITY SPACES)

CRESTVIEW APARTMENTS

RIVERSIDE CA

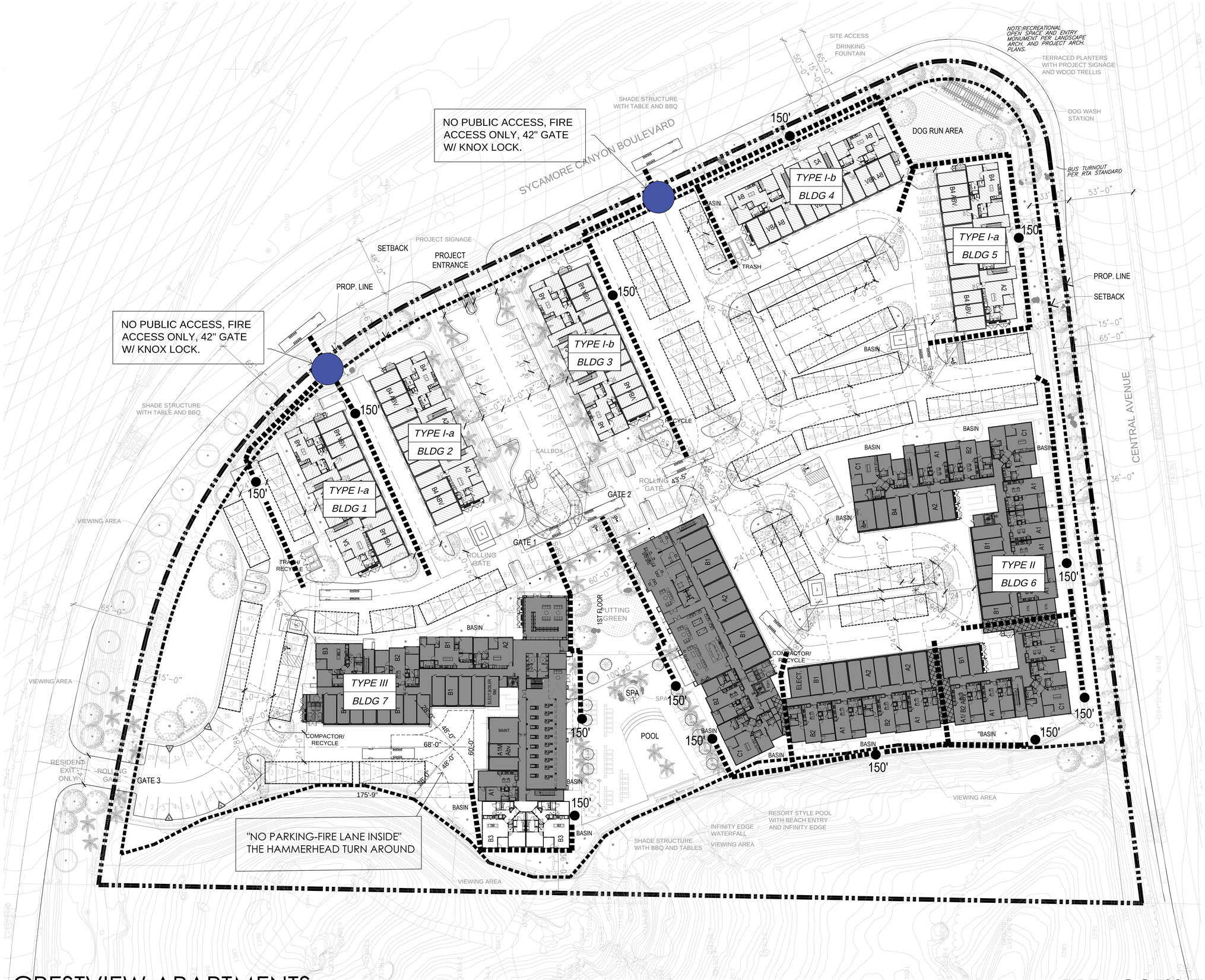
FIRE AREA ANALYSIS - BLDG TYPE III

DATE: 12-22-2020

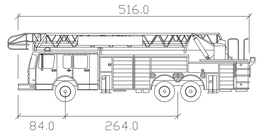
JOB NO.: 2018-549

KA ENTERPRISES
5820 OBERLIN DRIVE SUITE 201, RIVERSIDE CA 92121
(858) 404-6080

ARCHITECTS ORANGE
144 NORTH ORANGE ST., ORANGE, CA 92866
(714) 639-9860



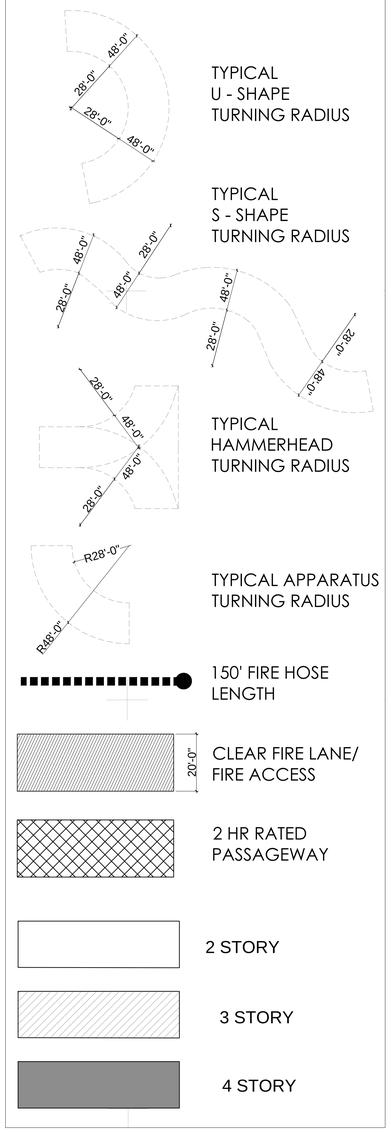
FIRE ACCESS LEGEND



FIRE TRUCK

Aerial Fire Truck

	inches
Width	: 102.0
Track	: 102.0
Lock to Lock Time	: 6.0
Steering Angle	: 33.3



NORTH

1"=30'-0" 0 15' 30' 60' 90'

A-5

SCALE : 1"= 30'-0"
DATE: 12-22-2020
JOB NO.: 2018-549

CRESTVIEW APARTMENTS

RIVERSIDE CA

FIRE ACCESS EXHIBIT

KA ENTERPRISES
5820 OBERLIN DRIVE SUITE 201, RIVERSIDE CA 92121
(858) 404-6080

ARCHITECTS ORANGE
144 NORTH ORANGE ST., ORANGE, CA 92866
(714) 639-9860

NORTHEAST WINDS - 60 MPH COMBINED
FUEL MODEL SH2/GR2 - FLAME LENGTHS
TO 18.8 FEET

SOUTHWEST WINDS - 30 MPH COMBINED
FUEL MODEL SCAL18/GR4 - FLAME LENGTHS
TO 34.1 FEET

SYCAMORE CANYON BOULEVARD

CENTRAL AVENUE

PROPOSED PL

EXISTING PL

NO PUBLIC ACCESS, FIRE ACCESS ONLY. GATE WITH KNOX LOCK.

NO PUBLIC ACCESS, EXISTING PL ONLY. GATE WITH KNOX LOCK.

PROJECT SIGNAGE

SITE ACCESS

DRINKING FOUNTAIN

TERRACED PLANTERS WITH PROJECT SIGNAGE AND WOOD TRELLIS

SHADE STRUCTURE WITH TABLE AND BBQ

DOG WASH STATION

BUS TURNOUT

DOG RUN AREA

BUILDING 1

BUILDING 2

BUILDING 3

BUILDING 4

BUILDING 5

BUILDING 6

BUILDING 7

CALLBOX

ROLLING GATE

VIEWING AREA

FH

LEASING OFFICE

CLUB HOUSE

CLUBHOUSE PATIO

MAIL LOUNGE

PUTTING GREEN

RESTROOM

FITNESS CENTER PATIO

FITNESS CENTER

SPA

RESIDENT EXIT ONLY

RESORT STYLE POOL WITH BEACH ENTRY AND INFINITY EDGE

INFINITY EDGE WATERFALL

SHADE STRUCTURE WITH BBQ AND TABLES

PROPOSED MSHCP CONSERVATION AREA

FUEL TREATMENT SITE PLAN LEGEND

CRESTVIEW APARTMENTS - APN 256-050-0-12
RIVERSIDE, CALIFORNIA

Symbol	Description
	IRRIGATED ZONE 1 (OWNER MAINTAINED) - All designated manufactured slopes, within 30 feet of a roadside or driveway, and within 50 feet of any habitable structure shall be planted with fire resistant vegetation and maintained to Irrigated Zone 1 criteria. Maintenance will be on-going throughout the year as needed. See Fuel Treatment Site Plan for proposed locations.
	THINNING ZONE 2 (OWNER MAINTAINED) - An area located along the western boundary between 50 and 100 feet from each structure. This area may include single or small clusters of trimmed fire resistance native plants up to 18 inches in height and trimmed native trees limbed up to 6 feet from the ground where 50% of the vegetation is removed. Selected native plant clusters must be separated by at least 1 1/2 times the mature height of the retained plants. The ground cover, native plants and grasses below the tree canopies shall be weed whipped and maintained to 4" or less in stubble height. See Fuel Treatment Site Plan for proposed locations.
FH	**FIRE HYDRANTS** - Proposed locations, final locations to be determined by engineering.
	Emergency/Fire Access Way Entrance - two means of access are provided. Access with a gate shall be installed per proposed locations in the Fuel Treatment Site Plan.
	TWO HOUR RATED WALLS - Buildings 1, 2, 3, & 7 are to have two-hour exterior wall assemblies. Building 6 has the exposed faces and that portion within the VHFHSZ to be wrapped as above. All buildings are compartmentalized with two-hour walls as required to comply with an NFPA 13R sprinkler system design for fire area per the CBC. However, buildings 1, 2, 3, 6, & 7 are proposed to be provided with a full NFPA 13 sprinkler system as an enhancement to protection. Refer to architectiral plans for more detailn. See Fuel Treatment Site Plan for proposed locations.

Prepared for: KA Enterprises
5820 Oberlin Drive, Suite 201
San Diego, CA 92121

Prepared By: FIREWISE 2000, LLC.
PO Box 39
Valley Center, CA 92082
Telephone: 760-745-3947
Info@firewise 2000.com

LANDSCAPE NOTE:
ALL LANDSCAPE ZONES WILL BE COORDINATED WITH CITY CASE PLANNER ON SELECTING THE FIRE RESISTIVE APPROVED LANDSCAPE.

Certified By

Mel Johnson, Owner Date: 11/10/2020

FIREWISE 2000, LLC
PO Box 339
Valley Center, CA 92082
Info@firewise2000.com
Telephone: (760) 745-3947

This Exhibit is found to be compliant with the Fire Protection Plan dated 11/10/2020.

Crestview Apartments

KA Enterprises

Fuel Treatment Site Plan

RHA Project # 19102

February 1, 2021

0' 30' 60' 90'

RHA LANDSCAPE ARCHITECTS PLANNERS, INC.

8.0 Owner, Occupant/Employee Education

A copy of this FPP shall be available in Crestview Apartments Managers office for review by any potential renter or employee. **The Office shall provide a copy of this Fire Protection Plan to any new owner at the close of escrow. Subsequent sellers shall include copies of this FPP in all escrow papers.**

The Crestview Apartments owners shall inform its employees/occupants that in the event of a wildland fire, they should always relocate to a safe area well beyond the path of the threatening wildland fire. If relocation is not possible and egress is cut-off by the fire, the employees/renters should seek shelter within any structure until the wildland fire passes through their area. The ignition resistant buildings will have a 'defensible space' area around each structure for firefighters to make their stand in the protection of each structure. In the event firefighting forces are not readily available, the defensible space will substantially increase the probability of 'structure survivability'.

Should employees/occupants not be able to relocate, they should ensure that all doors and windows are closed to prevent embers from entering their structure. Doors should be unlocked to allow emergency personnel unimpeded access. Both inside and outside lights should be placed on to allow emergency personnel to know that a structure is present when smoke or darkness may otherwise obscure visibility. In addition, combustible materials shall not be stored within 30 feet of any structure.

Each owner/occupant shall be aware of the herein described fire protection measures by reviewing this FPP of the types of non-combustible construction and plant materials that are allowed within the the designated fuel treatment zones. A copy of this plan shall be provided to a future owner during escrow procedures. Of particular importance are APPENDICES 'A', 'B', and 'D' of this plan which provide guidance in the types of plants that allowed to be established in landscaped areas and appropriate construction materials within fuel modification zones. Plant selection is critical as embers often travel over a mile during Santa Ana wind events.

Where this FPP requires specific construction features, these features shall not be changed without the approval of the RCFD. These features are required to maintain reasonable fire safety.

A maintenance plan/checklist shall be eveloped to ensure that combustible vegatation, such as leaves and pine needles do not accumulate on roof serfuces. Suggested inspection date is 1 July annually prior to Fire Season. He plan should also ensure complinace with unique porions of he plan. (metal screens, door closure devices, evacuation routes and gates, etc.)

9.0 Infrastructure

Below is a review and discussion of water supply and access roads/driveways and gates that are to be utilized in the development of Crestview Apartments.

9.1 Water Supply

The Crestview Apartments water supply will be provided by Riverside Public Utilities. An approved permanent water supply capable of supplying the required fire flow for each fire

protection system shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed. Said system shall be installed prior to the commencement of construction. The water supply system shall be a looped system served from two points. Recommended size for supply lines to hydrants is 8" minimum, with cross connecting mains every 600'.

Water supplies for fire protection and hydrants shall be in accordance with the 2019 California Fire Code as amended by the City of Riverside. All buildings shall be fire sprinklered. The minimum fire flow shall be 3,000 GPM at 20 psi residual pressure for a 4-hour duration for all buildings classifed as R-2 occupancies per the State Fire Code.

Hydrant installation shall conform to City of Riverside INFORMATION BULLETIN: D-19-005 and the 2019 NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems. Hydrant spacing shall be not less than 300' between hydrants, as measured from an approved emergency access route and shall be placed at all road intersections. Fire hydrants shall be tested, accepted, and placed in service prior to the delivery of any combustible materials to the project site.

9.2 Access Roads/Driveways and Gates

There shall be two means of public access into the project. One is via Sycamore Canyon Boulevard from the north and the second from the east. A rolling gate is scheduled to be installed for the northern entrance. Additionally, a rolling gate is scheduled to be installed west of Building 3.

Driveways and access roads within the development shall be termed 'Fire Access Roads' within this document. All fire access roads shall meet the requirements of the RCFD, and shall be all weather surface capable of supporting loads of 80,000 lbs gross vehicle weight. Unless otherwise approved by the RCFD Fire Marshal, the grade of a fire apparatus access road shall not exceed 16 percent and the cross slope shall not exceed 2.5 percent. Access to all exterior portions of each structure must be within 150 feet of the available fire department access. The required turning radius of a fire apparatus access road shall be in accordance with Information Bulletin B-19-001, 28 feet inside radius and 48 feet outside radius. in accordance with Information Bulletin B-19-001. unless otherwise approved by the fire code official. Fire lanes shall be marked in accordance with the guidelines in Information Bulletin B-19-003.

Any gates to be installed shall meet RCFD Standards and shall be approved by the RCFD prior to fabrication and installation. A Knox override key switch or similar device must be installed outside the gate in an approved, readily visible, and unobstructed location at or near the gate to provide emergency access. Gates accessing major roadways shall also be equipped with approved emergency traffic control-activating strobe light sensor(s), or other devices approved by the Fire Chief, which will activate the gate on the approach of emergency apparatus with a battery back-up or manual mechanical disconnect in case of power failure. All gates shall always be equipped to allow for automatic egress from the Crestview Apartments.

10.0 Fire Protection Plan Map

Attached in a separate file is the Fire Protection Plan Map depicting the location of all proposed fuel treatment locations as well as fire access roads, and development bundaries.

APPENDICES

Prohibited Plant List	**APPENDIX 'A'**
Defensible Space Landscaping	**APPENDIX 'B'**
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Non-combustible & Ignition Resistant Building Materials	**APPENDIX 'D'**
Ignition Resistant Construction Requirements	**APPENDIX 'E'**
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APPENDIX ‘A’

Prohibited Plant List

APPENDIX 'A'

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

	Botanical Name	Common Name	Plant Form
1.	Acacia species •	Acacia	Shrub/Tree
2.	Adenostema fasciculatum	Chamise	Shrub
3.	Adenostema sparsifolium	Red Shank	Shrub/Tree
4.	Artemisia californica	California Sagebrush	Shrub
5.	Anthemis cotula	Mayweed	Weed
6.	Arundo donax	Giant reed	Grass/weed
7.	Brassica nigra	Black Mustard	Weed
8.	Brassica ropa	Yellow Mustard	Weed
9.	Cedrus species	Cedar	Tree
10.	Cirsim vulgare	Wild Artichoke	Weed
11.	Conyza canadensis	Horseweed	Weed
12.	Cortaderia selloana	Pampas Grass	Tall Grass
13.	Cupressus species	Cypress	Tree
14.	Eriogonum fasciculatum	Common Buckwheat	Shrub
15.	Eucalyptus species	Eucalyptus	Shrub/Tree
16.	Heterotheca grandiflora	Telegraph plant	Weed/shrub
17.	Juniperus species	Junipers	Succulent
18.	Lactuca serriola	Prickly lettuce	Weed
19.	Nicotiana bigelevil	Indian tobacco	Shrub
20.	Nicotiana glauca	Tree tobacco	Shrub
21.	Pennisetum species	Fountain Grass	Ground cover
22.	Pinus species	Pines	Tree
23.	Rosmarinus species	Rosemary	Shrub
24.	Salvia species • •	Sage	Shrub
25.	Silybum marianum	Milk thistle	Weed
26.	Urtica urens	Burning nettle	Weed

- Except:
  Acacia redolens desert carpet (Desert Carpet ground cover)

• • Except:
  Salvia columbariae (chia)
  Salvia sonomensis (Creeping Sage)

Additionally, all of the following plants shall be removed from fuel treatment zones in order to not only reduce fuel loading but also eliminate invasive plants that are identified in the Multiple Species Habitat Conservation Plan for Riverside County (MSHCP).

TABLE 6-2
PLANTS THAT SHOULD BE AVOIDED
ADJACENT TO THE MSHCP CONSERVATION AREA

BOTANICAL NAME	COMMON NAME
Acacia spp. (all species)	acacia
Achillea millefolium	var. *millefolium* common yarrow
Ailanthus altissima	tree of heaven
Aptenia cordifolia	red apple
Arctotheca calendula	cape weed
Arctotis spp. (all species & hybrids)	African daisy
Arundo donax	giant reed or arundo grass
Asphodelus fistulosus	asphodel
Atriplex glauca	white saltbush
Atriplex semibaccata	Australian saltbush
Carex spp. (all species*)	sedge
Carpobrotus chilensis	ice plant
Carpobrotus edulis	sea fig
Centranthus ruber	red valerian
Chrysanthemum coronarium	annual chrysanthemum
Cistus ladanifer	(incl. hybrids/varieties) gum rockrose
Cortaderia jubata [*syn.C. Atacamensis*]	jubata grass, pampas grass
Cortaderia dioica [syn. *C. sellowana*]	pampas grass
Cotoneaster spp. (all species)	cotoneaster
Cynodon dactylon	(incl. hybrids varieties) Bermuda grass
Cyperus spp. (all species*)	nutsedge, umbrella plant
Cytisus spp. (all species)	broom

Delosperma 'Alba'	white trailing ice plant
Dimorphotheca spp. (all species)	African daisy, Cape marigold
Drosanthemum floribundum	rosea ice plant
Drosanthemum hispidum	purple ice plant
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Eucalyptus spp. (all species)	eucalyptus or gum tree
Eupatorium coelestinum [syn. Ageratina sp.]	mist flower
Festuca arundinacea	tall fescue
Festuca rubra	creeping red fescue
Foeniculum vulgare	sweet fennel
Fraxinus uhdei	(and cultivars) evergreen ash, shamel ash
Gaura (spp.) (all species)	gaura
Gazania spp. (all species & hybrids)	gazania
Genista spp. (all species)	broom
Hedera canariensis	Algerian ivy
Hedera helix	English ivy
Hypericum spp. (all species)	St. John's Wort
Ipomoea acuminata	Mexican morning glory
Lampranthus spectabilis	trailing ice plant
Lantana camara	common garden lantana
Lantana montevidensis [syn. *L. sellowiana*]	lantana
Limonium perezii	sea lavender
Linaria bipartita	toadflax
Lolium multiflorum	Italian ryegrass
Lolium perenne	perennial ryegrass
Lonicera japonica	(incl. 'Halliana') Japanese honeysuckle
Lotus corniculatus	birdsfoot trefoil
Lupinus arboreus	yellow bush lupine
Lupinus texanus	Texas blue bonnets

Malephora crocea	ice plant
Malephora luteola	ice plant
Mesembryanthemum nodiflorum	little ice plant
Myoporum laetum	myoporum
Myoporum pacificum	shiny myoproum
Myoporum parvifolium	(incl. 'Prostratum') ground cover myoporum
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Opuntia ficus-indica	Indian fig
Osteospermum spp. (all species)	trailing African daisy, African daisy,
Oxalis pes-caprae	Bermuda buttercup
Parkinsonia aculeata	Mexican palo verde
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Plumbago auriculata	cape plumbago
Polygonum spp. (all species)	knotweed
Populus nigra 'italica	' Lombardy poplar
Prosopis spp. (all species*)	mesquite
Ricinus communis	castorbean
Robinia pseudoacacia	black locust
Rubus procerus	Himalayan blackberry
Sapium sebiferum	Chinese tallow tree
Saponaria officinalis	bouncing bet, soapwart
Schinus molle	Peruvian pepper tree, California pepper
Schinus terebinthifolius	Brazilian pepper tree
Spartium junceum	Spanish broom
Tamarix spp. (all species)	tamarisk, salt cedar
Trifolium tragiferum	strawberry clover
Tropaelolum majus	garden nasturtium

Ulex europaeus	prickly broom
Vinca major	periwinkle
Yucca gloriosa	Spanish dagger

An asterisk (*) indicates some native species of the genera exist that may be appropriate.

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division
of Plant Health and Pest Prevention Services, California Native Plant Society,
Fremontia Vol. 26 No. 4, October 1998, The Jepson Manual; Higher Plants of California,
and County of San Diego-Department of Agriculture.

APPENDIX ‘B’

Defensible Space Landscaping

Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
1.	W_	Abelia x grandiflora	Glossy Abelia	Shrub
2.	_	Acacia redolens desert carpet	Desert Carpet	Shrub
3.	_	Acer macrophyllum	Big Leaf Maple	Tree
4.	X	Achillea millefolium	Common Yarrow	Low shrub
5.	W	Achillea tomentosa	Wolly Yarrow	Low shrub
6.	X	Aeonium decorum	Aeonium	Ground cover
7.	X	Aeonium simsii	Aeonium	Ground cover
8.	W	Agaave attenuata	Century Plant	Succulent
9.	W	Agave shawii	Shaw's Century Plant	Succulent
10.	N	Agave victoriae-reginae	Agave	Ground cover
11.	X	Ajuga reptans	Carpet Bugle	Ground cover
12.	W_	Alnus cordata	Italian Alder	Tree
13.	_	Alnus rhombifolia	White Alder	Tree
14.	N	Aloe aborescens	Torch Aloe	Shrub
15.	N	Aloe aristata	Dwarf Aloe	Ground cover
16.	N	Aloe brevifolia	Aloe	Ground cover
17.	W	Aloe Vera	Medicinal Aloe	Succulent
18.	W_	Alyogyne huegelii	Blue Hibiscus	Shrub
19.	_	Ambrosia chamissonis	Beach Bur-Sage	Perennial
20.	_	Amoroha fruticosa	Western False Indigobush	Shrub
21.	W_	Anigozanthus flavidus	Kangaroo Paw	Perennial Accent
22.	_	Antirrhinum nuttalianum ssp. Nuttatianum	Beard Tongue	Subshrub
23.	X	Aptenia cordifolia x 'Red Apple'	Red Apple Aptenia	Ground cover
24.	W	Arbutus unedo	Strawberry Tree	Tree
25.	W	Arctostaphylos 'Pacific Mist'	Pacific Mist Manzanita	Ground cover
26.	W_	Arctostaphyis edmundsil	Little Sur Manzanita	Ground cover
27.	_	Arctostaphylos glandulosa	Eastwood Manzanita	Shrub
28.	W	Arctostaphylos hookeri 'Monterey Carpet'	Monterey Carpet Manzanita	Low shrub
29.	N	Arctostaphylos pungens	Heather	Shrub
30.	N	Arctostaphylos refugioensis	Refugio Manzanita	Shrub
31.	W	Arctostaphylos uva-ursi	Bearberry	Ground cover
32.	W	Arctostaphylos x 'Greensphere'	Greensphere Manzanita	Shrub
33.	N	Atemisia caucasia	Caucasian Artemisia	Ground cover
34.	N	Artemisia pycnocephaia	Beach Sagewort	Perennial
35.	X	Atriplex canescens	Four-Wing Saltbush	Shrub
36.	X_	Atriplex lentiformis ssp. Breweri	Brewer Saltbush	Shrub
37.	_	Baccharis emoryi	Emory Baccharis	Shrub
38.	W_	Baccharis pilularis ssp. Consanguinea	Chaparral Bloom	Shrub

X = Plant Species prohibited in wet and dry fuel modification zones adjacent to native open space lands. Acceptable in all other fuel modification zones and locations.

W = Plant species appropriate for use in wet fuel modification zones adjacent to native open space lands. Acceptable in all other wet and irrigated dry (manufactured slopes) fuel modification zones and locations.

_ = Plant species native to Riverside, Orange and San Diego Counties. Acceptable in all fuel modification (wet or dry zones) in all locations.

N = Plant species acceptable on a limited basis (maximum 30% of the area at time of planting) in wet fuel modification zones adjacent to native open space reserve lands. Acceptable in all other fuel modification zones and locations.

* = If seed collected from local seed source.

** = Not native plant species but can be used in all fuel modification zones.

Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
39.	X_	Baccharis pilularis var. pilularis 'Twin Peaks #2'	Twin Peaks	Ground cover
40.	_	Baccharis salicifolia	Mulefat	Shrub
41.	N	Baileya Multiradiata	Desert Marigold	Ground cover
42.	W	Beaucarnea recurvata	Bottle Palm	Shrub/Small tree
43.	N_	Bougainvillea spectabilis	Bougainvillea	Shrub
44.	N_	Brahea armata	Mexican Blue Palm, Blue Hesper Palm	Palm
45.	N_	Brahea brandegeei	San Jose Hesper Palm	Palm
46.	N_	Brahea edulis	Guadalupe Palm	Palm
47.	_	Brickellia californica	Hoary Nettle	Subshrub
48.	W_	Bromus carinatus	California Brome	Grass
49.	_	Camissionia cheiranthifolia	Beach Evening Primrose	Perennial subshrub
50.	N	Carissa macracarpa	Green Carpet Natal Plum	Ground cover/shrub
51.	X	Carpibrotus chilensis	Sea Fig Ice Plant	Ground cover
52.	W	Ceanothus gloriosus 'Point Reyes'	Point Reyes Ceanothus	Shrub
53.	W	Ceanothus griseus 'Louise Edmunds'	Louis Edmunds Ceanothus	Shrub
54.	W	Ceanothus griseus horizontalis	Yankee Point	Ground cover
55.	W	Ceanothus griseus var. horizontalis	Carmel Creeper Ceanothus	Shrub
56.	_	Ceanothus megacarpus	Big Pod Ceanothus	Shrub
57.	W_	Ceanothus prostrastus	Squaw Carpet Ceanothus	Shrub
58.	_	Ceanothus spinosus	Green Bark Ceanothus	Shrub
59.	W	Ceanothus verrucosus	Wart-Stem Ceanothus	Shrub
60.	W	Cerastium tomentosum	Snow-in-summer	Ground cover/shrub
61.	W	Ceratonia siliqua	Carob	Tree
62.	W	Cercis occidentalis	Western redbud	Tree/Shrub
63.	X	Chrysanthemum leucanthemum	Oxeye Daisy	Groundcover
64.	W	Cistus hybridus	White Rockrose	Shrub
65.	W	Cistus incanus	Mauve Rockrose	Shrub
66.	W	Cistus incanus salviafolius	Sageleaf Rockkrose	Shrub
67.	W	Cistus purpureus	Orchid Rockrose	Shrub
68.	W_	Citrus species	Citrus	Tree
69.	_	Clarkia bottae	Showy Fairwell to Spring	Annual
70.	_	Cneoridium dumosum	Bushrue, Pt. Reyes Ceanothus	Shrub
71.	_	Collinsia heterophylla	Chinese Houses	Annual
72.	W_	Comarostaphylis diversifolia	Summer Holly	Shrub
73.	N	Convolvulus cneorum	Bush Morning Glory	Shrub
74.	W	Coprosma kirkii	Creeping Coprosma	Ground cover/Shrub
75.	W	Coprosma pumila	Prostrate Coprosma	Low Shrub
76.	_	Coreopsis californica	California coreopsis	Annual
77.	W	Coreopsis lanceolata	Coreopsis	Ground cover

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Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
78.	N	Correa pulchella	Australian Fushia	Ground cover
79.	W	Cotoneaster buxifolius	Grayleaf Cotoneaster	Shrub
80.	W	Cotoneaster congestus Likiang	Likiang Cotoneaster	Ground cover/Vine
81.	X	Crassula lactea	Taylor's Parches	Ground cover
82.	X	Crassula ovata	Jade Tree	Shrub
83.	X	Crassula tetragona	Jade Plant	Shrub
84.	W	Croton californicus	California Croton	Ground cover
85.	X	Delosperma 'alba'	White Trailing Ice Plant	Ground cover
86.	_	Dendromecon rigida	Bush Poppy	Shrub
87.	_	Dichelostemma capitatum	Blue Dicks	Herb
88.	N	Distictis buccinatoria	Blood-Red Trumpet Vine	Vine/Climbing vine
89.	N	Dodonaea viscosa	Hopseed Bush	Shrub
90.	X	Drosanthemum floribundum	Rosea Ice Plant	Ground cover
91.	X	Drosanthemum hispidum	Ice Plant, Showy Dewflower	Ground cover
92.	_	Dudleya lanceolat	Lance Leaved Dudleya	Succulent
93.	_	Dudleya pulverulenta	Chalk Dudleya	Succulent
94.	W	Elaeagnus pungens	Silverberry	Shrub
95.	_	Encelia californica	California Encelia	Small shrub
96.	_	Epilobium canum (Zauschneria californica)	Hoary California Fushia	Shrub
97.	_	Eriastrum sapphirinum	Mojave Wolly Star	Annual
98.	N	Eriobotrya japonica	Loquat	Tree
99.	_	Eriodictycon crassifolium	Thick-Leaf Yerba Santa	Shrub
100.	_	Eriodictycon trichocalyx	Mojave Wooly Star	Annual
101.	W	Eriophyllum confertiflorum	Golden Yarrow	Shrub
102.	W	Erythrina species	Coral Tree	Tree
103.	W	Eschscholzia californica	California Poppy	Flower
104.	X	Eschscholzia mexicana	Mexican Poppy	Herb
105.	N	Euonymus fortunei	Winter Creeper Euonymus	Ground cover
106.	N	Fiejoa sellowiana	Pineapple Guava	Shrub/Tree
107.	N	Fragaria chiloensis	Wild Strawberry/ Sand Strawberry	Ground cover
108.	_	Frankenia salina	Alkali Heath	Ground cover
109.	W	Fremontodendron californicum	California Flannelbush	Shrub
110.	X	Gaillardiaa x grandiflora	Blanketflower	Ground cover
111.	W	Galvezia speciosa	Bush Snapdragon	Shrub
112.	W	Garrya ellipta	Silktassel	Shrub
113.	X	Gazania hybrids	South African Daisy	Ground cover
114.	X	Gazania rigens leucolaena	Trailing Gazania	Ground cover
115.	_	Gilia capitata	Globe Gilia	Perennial
116.	W	Gilia lepthantha	Showy Gilia	Perennial

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Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
117.	W	Gilia tricolor	Bird's Eyes	Perennial
118.	W	Ginko biloba	Maidenhair Tree	Tree
119.	_	Gnaphalium californicum	California Everlasting	Annual
120.	W	Grewia occidentalis	Starflower	Shrub
121.	_	Grindelia stricta	Gum Plant	Ground cover
122.	N	Hakea suaveolens	Sweet Hakea	Shrub
123.	W	Harde bergia comptoniana	Lilac Vine	Shrub
124.	N	Helianthemum mutabile	Sunrose	Ground cover/Shrub
125.	_	Helianthemum scoparium	Rush Rose	Shrub
126.	_	Heliotropium curassavicum	Salt Heliotrope	Ground cover
127.	X	Helix canariensis	English Ivy	Ground cover
128.	W	Hesperaloe parviflora	Red Yucca	Perennial
129.	_	Heteromeles arbutifolia	Toyon	Shrub
130.	X	Hypericum calcycinum	Aaron's Beard	Shrub
131.	N	Iberis sempervirens	Edging Candytuft	Ground cover
132.	N	Iberis umbellatum	Globe Candytuft	Ground cover
133.	_	Isocoma menziesii	Coastal Goldenbush	Small shrub
134.	_	Isomeris arborea	Bladderpod	Shrub
135.	W	Iva hayesiana	Poverty Weed	Ground cover
136.	N	Jublans californica	California Black Walnut	Tree
137.	_	Juncus acutus	Spiny Rush	Perennial
138.	_	Keckiella antirrhinoides	Yellow Bush Penstemon	Subshrub
139.	_	Keckiella cordifolia	Heart Leaved Penstemon	Subshrub
140.	_	Keckiella ternata	Blue Stemmed Bush Penstemon	Subshrub
141.	W	Kniphofia uvaria	Red Hot Poker	Perennial
142.	W	Lagerstroemia patersonii	Crape Myrtle	Tree
143.	X	Lampranthus aurantiacus	Bush Ice Plant	Ground cover
144.	X	Lampranthus filicaulis	Redondo Creeper	Ground cover
145.	X	Lampranthus spectabilis	Trailing Ice Plant	Ground cover
146.	W	Lantana camara cultivars	Yellow Sage	Shrub
147.	W	Lantana montevidensis	Trailing Lantana	Shrub
148.	_	Lasthenia californica	Dwark Goldfields	Annual
149.	W	Lavandula dentataq	French Lavendar	Shrub
150.	W	Leptospermum laevigatum	Australian Tea Tree	Shrub
151.	W	Leucophyllum frutescens	Texas Ranger	Shrub
152.	_	Leymus condensatus	Giant Wild Rye	Large grass
153.	N	Ligustrum japonicum	Texas Privet	Shrub
154.	X	Limonium perezii	Sea Lavender	Shrub
155.	W	Liquidambar styraciflua	American Sweet Gum	Tree
156.	W	Liriodendron tulipifera	Tulip Tree	Tree

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Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
157.	X	Lonicera japonica 'Halliana'	Hall's Japanese Honeysuckle	Vining Shrub
158.		Lonicera subspicata	Wild Honeysuckle	Vining Shrub
159.	X	Lotus corniculatus	Bird's Foot Trefoil	Ground Cover
160.		Lotus Heermanii	Woolly Lotus	Perennial
161.		Lotus Scoparius	Deerweed	Shrub
162.	W	Lupinus arizonicus	Desert Lupine	Annual
163.	W	Lupinus benthamil	Spider Lupine	Annual
164.		Lupinus bicolor	Sky Lupine	Flowering annual
165.		Lupinus sparsiflorus	Coulter's Lupine	Annual
166.	W	Lyonothamnus floribundus ssp. Asplenfolius	Fernleaf Ironwood	Tree
167.	W	Macademia Integrifolia	Macadamia Nut	Tree
168.	W	Mahonia aquifolium 'Golden Abundance'	Golden Abundance, Oregon Grape	Shrub
169.	W	Mahonia nevinii	Nevin Mahonia	Shrub
170.		Malacothamnus fasciculatus	Chaparral Marrow	Shrub
171.	X	Makephora luteola	Trailing Ice Plant	Ground cover
172.	W	Maytenus boaria	Mayten Tree	Tree
173.	W	Melaleuca nesophila	Pink Melaleuca	Shrub
174.	N	Metrosideros excelsus	New Zealand Christmas Tree	Tree
175.	*	Mimulus species	Monkeyflower	Flower
176.		Mirabilis californica	Wishbone Bush	Perennial
177.	N	Myoporum debile	Trailing Myoporum	Shrub
178.	N	Myoporum insulare	Boobialla	Shrub
179.	W	Myoporum parvifolium	Creeping Boobialla	Ground cover
180.	W	Myoporum 'Pacificum'	Trailing Myoporum	Shrub
181.		Nassella [stipa] lepida	Foothill Needlegrass	Ground cover
182.		Nassella stipa] pulchra	Purple Needlegrass	Ground cover
183.		Nemophila menziesii	Baby Blue Eyes	Annual
184.	X	Nerium oleander	Oleander	Shrub
185.		Oenothera hookeri	California Evening Primrose	Flower
186.	W	Oenothera speciosa	Showy Evening Primrose	Perennial
187.	X	Ophiopogon japonicus	Mondo Grass	Ground cover
188.	*	Opuntia littoralis	Prickly Pear	Cactus
189.	*	Opuntia oricola	Oracle Cactus	Cactus
190.	*	Opuntia prolifera	Coast Cholla	Cactus
191.	W	Osmanthus fragrans	Sweet Olive	Shrub
192.	X	Osteospermum fruticosum	Trailing African Daisy	Ground cover
193.	X	Parkinsonia aculeata	Mexican Palo Verde	Tree
194.	W	Pelargonium peltatum	Ivy Geranium	Ground cover
195.	X	Penstemon species	Beard Tongue	Shrub

X = Plant Species prohibited in wet and dry fuel modification zones adjacent to native open space lands. Acceptable in all other fuel modification zones and locations.

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_ = Plant species native to Riverside, Orange and San Diego Counties. Acceptable in all fuel modification (wet or dry zones) in all locations.

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Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
196.	W	Photinia Fraseri	Red Robin	Shrub
197.	W	Pistacia chinensis	Chinese pistache	Tree
198.	X	Pittosporum undulatum	Victorian Box	Tree
199.	_	Plantage erecta	California Plantain	Annual
200.	**	Plantago insularis	Woolly Plantain	Annual
201.	X	Plantago sempervirens	Evergreen Plantain	Ground cover
202.	W	Platanus racemosa	California Sycamore	Tree
203.	W	Plumbago auriculate	Plumbago Cape	Shrub
204.	_	Populus fremontii	Western Cottonwood	Tree
205.	X	Portulacaria afra	Elephant's Foot	Shrub
206.	_	Potentilla glandulosa	Sticky Cinquefoil	Subshrub
207.	X	Potentilla tabernaemontanii	Spring Cinquefoil	Ground cover
208.	X	Prunus caroliniana	Carolina Cherry Laurel	Shrub/Tree
209.	_	Prunus ilicifolia ssp. Ilicifolia	Holly Leaved Cherry	Shrub
210.	X	Prunus lyonii	Catalina Cherry	Shrub/Tree
211.	N	Punica granatum	Pomegranate	Shrub/Tree
212.	W	Puya species	Puya	Succulent/shrub
213.	W	Pyracantha species	Firethorn	Shrub
214.	_	Quercus agrifolia	Coast Live Oak	Shrub
215.	*	Quercus berberdifolia	California Scrub Oak	Shrub
216.	*	Quercus dumosa	Coastal Scrub Oak	Shrub
217.	X	Quercus engelmannii	Engelmann Oak	Tree
218.	X	Quercus suber	Cork Oak	Tree
219.	X	Rhamnus alaternus	Italian Buckthorn	Shrub
220.	_	Rhamnus californica	California Coffee Berry	Shrub
221.	_	Rhamnus crocea	Redberry	Shrub
222.	_	Rhamnus crocea ssp. Ilicifolia	Hollyleaf Redberry	Shrub
223.	N	Rhaphiolepis species	Indian Hawthorn	Shrub
224.	_	Rhus integrifolia	Lemonade Berry	Shrub
225.	N	Rhus lancea	African Sumac	Tree
226.	_	Rhus ovataa	Sugarbush	Shrub
227.	_	Ribes aureum	Golden Currant	Shrub
228.	_	Ribes indecorum	White Flowering Currant	Shrub
229.	_	Ribes speciosum	Fuschia Flowering Gooseberry	Shrub
230.	W	Ribes viburnifolium	Evergreen Currant	Shrub
231.	*	Romneya coulteri	Matilija Poppy	Shrub
232.	X	Romneya coulteri 'White Cloud'	White Cloud Matilija Poppy	Shrub
233.	W	Rosmarinus officinalis	Rosemary	Shrub
234.	W	Salvia greggii	Autumn Sage	Shrub

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Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange and San Diego Counties

	Code	Botanical Name	Common Name	Plant Form
235.	W_	Salvia sonomensis	Creeping Sage	Ground cover
236.	_	Sambucus mexicana	Mexican Elderberry	Tree
237.	W	Santolina chamaecyparissis	Lavender Cotton	Ground cover
238.	W	Santolina virens	Green Lavender Cotton	Shrub
239.	_	Satureja chandleri	San Miguel Savory	Perennial
240.	_	Scirpus acutus	Hard-Stem Bulrush	Perennial
241.	_	Scirpus californicus	California Bulrush	Perennial
242.	X	Sedum acre	Goldmoss Sedum	Ground cover
243.	X	Sedum album	Green stonecrop	Ground cover
244.	X	Sedum confusum	Stonecrop	Ground cover
245.	X	Sedum x rubrotinctum	Pork & Beans	Ground cover
246.	X	Senecio serpens	Dusty Miller	Ground cover
247.	_	Sisyrinchium bellum	Blue-Eyed Grass	Ground cover
248.	_	Solanum douglasii	Douglas Nightshade	Shrub
249.	_	Solanum xantii	Purple Nightshade	Perennial
250.	W	Stenocarpus sinuatus	Firewheel Tree	Tree
251.	W	Strelitzia nicolai	Giant Bird of Paradise	Perennial
252.	W	Strelitzia reginae	Bird of Paradise	Perennial
253.	_	Symphoricarpos mollis	Creeping Snowberry	Shrub
254.	W	Tecoma stans [stenolibium stans]	Yellow Bells	Shrub/small tree
255.	X	Tecomaria capensis	Cape Honeysuckle	Ground cover
256.	N	Teucrium chamaedrys	Germander	Ground cover
257.	N	Thymus serpyllum	Lemon Thyme	Ground cover
258.	N	Trachelospermum jasminoides	Star Jasmine	Shrub
259.	_	Trichostems lanatum	Wolly Blue-Curls	Shrub
260.	X	Trifolium hirtum 'Hyron'	Hyron Rose Clover	Ground cover
261.	X	Trifolium fragiferum 'O'Connor's'	O'Connor's Legume	Ground cover
262.	_	Umbellularia californica	California Laurel	Tree
263.	_	Verbena Lasiostachys	Western Vervain	Perennial
264.	N	Verbena peruviana	Peruvian Verbena	Ground cover
265.	X	Verbena species	Verbena	Ground cover
266.	X	Vinca minor	Dwarf Periwinkle	Ground cover
267.	_	Vitis Girdiana	Desert Wild Grape	Vine
268.	X	Vulpia myuros 'Zorro'	Zorro Annual Fescue	Grass
269.	W	Westringia fruticosa	Coast Rosemary	Shrub
270.	W	Xanthorrhoea species	Grass Tree	Perennial / shrub
271.	W	Xylosma congestum	Shiny Xylosma	Shrub
272.	X	Yucca species	Yucca	Shrub
273.	_	Yucca whippiei	Yucca	Shrub

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APPENDIX 'C'

Literature References

Literature References

1. Andrews, Patricia L. 2013. Current status and future needs of the BehavePlus Fire Modeling System. International Journal of Wildland Fire 23(1):21-33.

2. California Code of Regulations Title 24 and Title 14, section 1280

3. California Public Resources Code Sections 4201 through 4204

4. California Government Code, sections 51175 through 51189

5. National Fire Protection Association - NFPA 13 - *Standard for the Installation of Sprinkler Systems. 2019 Edition*

6. National Fire Protection Association - NFPA 1144, 2018 Edition - *Standard for Reducing Structure Ignition Hazards from Wildfire*

7. National Fire Protection Association - NFPA 1142, 2018 Edition. *Table C.11 (b) Time-Distance Table Using an Average Speed of 35 mph*

8. 2016 Plant Pallet for Defensible Space Guideline, Defensible Space Landscaping – Plant Pallet for Fuel Modification in Riverside, Orange, and San Diego Counties. 7 pages.

9. International Urban-Wildland Interface Code, 2018 edition

10. 2019 California Fire Code and Local Amendments including Appendices to Chapters 1 & 4 and Appendices B, F & H

11. Chapter 7A-2019 California Building Code

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

13. Corona City Building Code, Chapter 15.12

14. Corona City Health and Safety Code, Chapter 8.24

15. City of Corona Fire Department Weed Abatement Regulations and Fuel Modification Program for Hazardous Fire Areas.

16. Western Region Climate Center. *Historic Climate Data from Remote Automated Weather Stations.* RAWS USA Climate Archive. Reno, NV.

APPENDIX 'D'
Non-combustible & Ignition Resistant Building Materials

APPENDIX 'D'

Non-Combustible & Ignition Resistant Building Materials For Balconies, Carports, Decks, Patio Covers and Floors

Examples of non-combustible & fire-resistant building materials for balconies, carports decks, patio covers, and floors are as follow:

I. NON-COMBUSTIBLE HEAVY GAGE ALUMINUM MATERIALS - *Metals USA Building Products Group - Ultra-Lattice*

Ultra-Lattice Stand Alone Patio Cover

Ultra-Lattice Attached Patio Cover

Ultra-Lattice Solid Patio Cover

Ultra-Lattice Vs. Wood

II. FRX Exterior *Fire-Retardant* Treated Wood

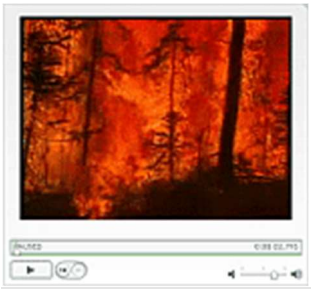
III. TREX COMPANY, INC –"Trex Accents ®: Fire Defense ™ " wood and polyethylene composite deck board, nominal 5/4" thick x 5-1/2" width, nominal density of 0.036 lb./in^3.

Exterior Fire Retardant Treated (FRT) Wood

FRX® fire retardant treated wood may be used in exterior applications permitted by the codes where: public safety is critical, other materials would transfer heat or allow fires to spread, sprinkler systems cannot easily be installed, corrosive atmospheres necessitate excessive maintenance of other materials, or fire protection is inadequate or not readily available. The International Building, Residential and Urban-Wildland Interface Codes and regulations permit the use of fire-retardant treated wood in specific instances. See below for typical exterior uses and typical residential uses.

Typical Exterior Uses

- Balconies
- Decks



Homeowners and Residential Architects: See this 2-minute video and the diagram below.

For information on fire retardant treated wood for exterior uses, visit www.frxwood.com.

Trex Accents®: Fire Defense™

The perfect blend of beauty and brawn.

Trex's #1 selling platform, Trex Accents®, exceeds the strict fire regulations set by the State of California and San Diego County.

- Offers superior safety performance:
    - Exceeds ASTM E84 Class B Flame Spread.
    - Exceeds 12-7A-4 Part A (underflame) and Part B (Burning Brand).
- Self-extinguishing even under extreme fire exposure.

Approved for use by the California State Fire Marshal's Office and San Diego County. Read the California Department of Forestry and Fire Protection, Office of the State Fire Marshal WILDLAND URBAN INTERFACE (WUI)PRODUCTS Report. (PDF)

IV. SOLID "WOOD" DECKING

Company Name: Various Manufacturers

Product Description: Solid "Wood" decking: "Redwood", "Western Red Cedar", "Incense Cedar", "Port Orford Cedar", and "Alaska Yellow Cedar".
Sizes: Minimum nominal 2" thickness (American Softwood Lumber Standard PS 20).
Lumber grades: Construction Common and better grades for Redwood, 3 Common and better grades for Cedars, and commercial decking or better grades for both Redwood and Cedars.

Special Instructions: Solid wood decking shall be installed over solid wood joists spacing 24" or less on center.

Decking (SFM Standard 12-7A-4)

V. Vents

Examples of Approved Vents

Brandguard

O'Hagin Fire & Ice® Line – Flame and Ember Resistant
An available option for all O'Hagin attic ventilation products, this attic vent not only features all the same design, construction elements and color choices as the O'Hagin Standard Line, but also features an interior stainless-steel matrix that resists the intrusion of flames and embers. This patent-pending attic vent is accepted for use by many local fire officials for installation in Wildland Urban Interface (WUI) zones.

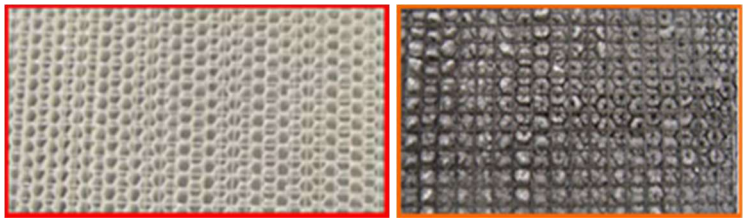
Vulcan Vents

The founders of Gunter Manufacturing have been working closely over the last two years, with the scientists and inventors of Vulcan Technologies to bring to market this incredible product.

Combining our quality vent products with the fire-stopping honeycomb matrix core designed by Vulcan has produced unique and remarkable results.

At Gunter manufacturing has over 50 years of combined sheet metal manufacturing experience. Special orders are not a problem. Their vent frames are industry standard frames so there is little or no learning curve for installers and contractors. Their stated goal is to provide people with the vents they need to secure their homes with additional safety against wildfires and give them piece of mind from knowing that their home or structure is protected by a product that works!

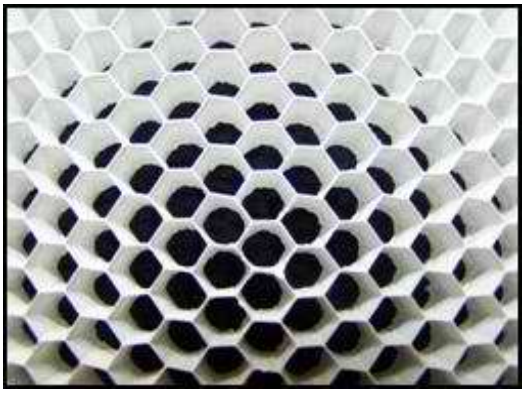
The core of their fire and ember safe vents are manufactured out of hi-grade aluminum honeycomb and coated with an intumescent coating made by Fire Free Coatings. The intumescent coating is designed to quickly swell up and close off when exposed to high heat. The expanded material acts as an insulator to heat, fire, and embers



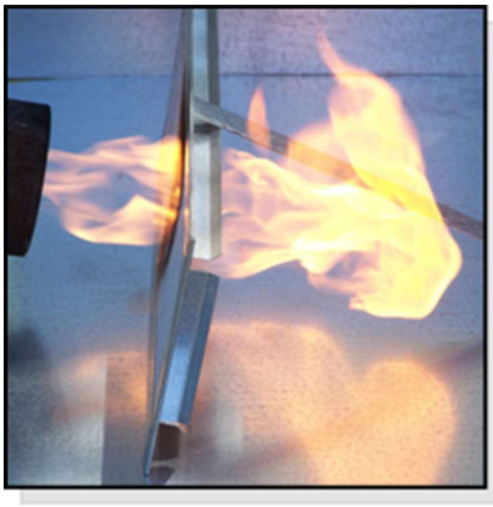
Before **After**

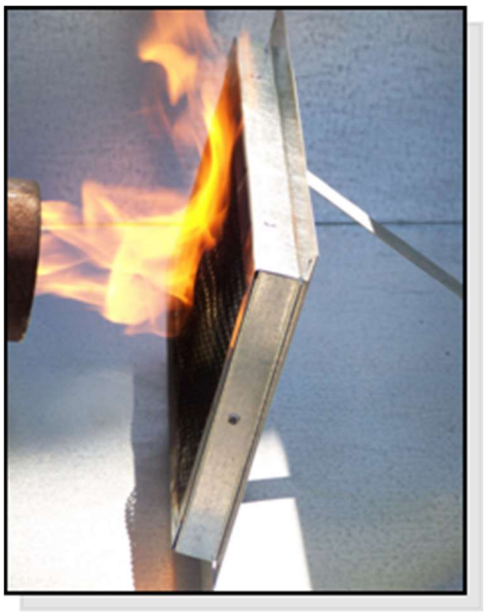
After the cells close off, they are extremely well insulated, and fire or embers cannot penetrate.

Even before the cells close off, the vent is designed to protect against flying embers. In many cases embers will attack a structure before fire ever comes near, so this feature is very important.



Close-up of the coated honeycomb matrix.





Fire easily passes through a standard vent, on the left, but stops cold when it comes up against a Vulcan Vent shown on right.

APPENDIX ‘E’
Ignition Resistant Construction

APPENDIX 'E'
Ignition Resistant Construction

As of the date of this FPP, the following is an edited list of ignition resistant construction requirements for buildings located in an Wildland Urban Interface Fire Area under the California Fire Code (CFC), Chapter 7A of the California Building Code (CBC) and the California Residential Code (CRC) R337. However the requirements listed below are not all inclusive and all exterior building construction including roofs, eaves, exterior walls, doors, windows, decks, and other attachments shall meet, in full, all of the CBC Chapter 7A ignition resistance requirements, CRC R337, CFC requirements and all currrent applicable codes and any exceptions or local requirements in force at the time of building permit application.

1. Ventilation openings for enclosed attics, soffit spaces, rafter spaces formed where ceilings are applied directly to the underside of the roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials, or other devices that are corrosion-resistant, a minimum of 1/16 inch and not exceed 1/8-inch and are non-combustible. Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by non-combustible wire mesh may be of combustible materials.

2. Vents shall not be installed on the underside of eaves and cornices except vents meeting the requirements of Item 1 may be installed if the attic space is protected by interior fire sprinklers or the exterior wall covering, and exposed underside of the eave are of noncombustible or ignition resistant materials and the vent is located more than 12 feet from the ground or walking surface of a deck, porch, patio, or similar surface.

3. The enforcing agency may approve special eave or cornice vents that resist intrusion of flame and burning embers.

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

5. Where valley flashing is installed, the flashing shall not be less than 0.019-inch No. 26 gage galvanized sheet corrosion resistant metal installed over not less than one layer of minimum 72-pound mineral surfaced non-perforated cap sheet complying with ASTM D 3909 at least 36 inch wide running the full length of the valley.

6. Rain gutters shall be provided with the means to prevent the accumulation of leaf litter and debris that contribute to roof edge ignition.

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

8. All structures will be built with a Class A roof assembly, including a Class A roof covering.

9. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped

with approved materials or have one layer of minimum No. 72 mineral surfaced on-perforated ASTM D 3909 cap sheet installed over the combustible decking.

10. The exposed roof deck on the underside of unenclosed roof eaves shall be protected by either non-combustible material; ignition resistant material; one layer of 5/8 inch Type X gypsum on the underside exterior; or 1-hour fire resistive exterior wall assembly applied to the underside of roof deck. Solid wood rafter tails with a 2-inch nominal minimum dimension; solid wood blocking installed between rafter tails with a 2-inch nominal minimum dimension; gable end overhangs and roof assembly projections beyond an exterior wall other than the lower end of the rafter tails; fascia; and other architectural trim boards do not require protection.

11. The exposed underside of roof eaves and roof eave soffits shall be protected by either non-combustible material; ignition resistant material; one layer of 5/8 inch Type X gypsum on the underside exterior; or 1-hour fire resistive exterior wall assembly applied to the underside of rafter tails or soffits. Gable end overhangs and roof assembly projections beyond an exterior wall other than the lower end of the rafter tails, fascia, and other architectural trim boards do not require protection.

12. The exposed underside of porch ceilings and the exposed underside of cantilevered floor projections where a floor assembly extends over an exterior wall shall be protected by non-combustible material, ignition resistant material, one layer of 5/8 inch Type X gypsum on the underside exterior, or 1-hour fire resistive exterior wall assembly applied to the underside of the porch ceilings or floor projections. Architectural trim boards do not require protection.

13. All chimney, flue or stovepipe openings will have an approved spark arrester. An approved spark arrester is defined as a device constructed of nonflammable materials, 12-gauge minimum thicknesses or other material found satisfactory by the FAHJ, having ½-inch perforations for arresting burning carbon or sparks. It shall be installed to be visible for the purposes of inspection and maintenance.

14. All structures will have automatic interior fire sprinklers designed and installed according to the National Fire Protection Association (NFPA) 13 - Standard for the Installation of Sprinkler Systems. Refer to the AM&M application for sprinkler coverage by structure.

15. All exterior windows and exterior glazed door assemblies or other transparent, translucent, or opaque glazing materials including skylights shall be constructed multi-layered glazed panels one layer of which must be tempered glass.

16. The exterior wall covering or assembly shall be non-combustible, ignition resistant, a heavy timber exterior wall assembly or log wall construction assembly and meet the performance criteria set forth in SFM Standard 12-7A-1. Exterior walls coverings shall extend from the top of the foundation to the roof and terminate at 2-inch nominal solid blocking between rafters at all roof overhangs or in the case of enclosed eaves, terminate at the enclosure.

17. Exterior doors shall conform to the performance requirements of standard SFM 12-7A-1, shall have a fire-resistance rating of not less than 20 minutes when tested according to

NFPA 252, and shall be of approved non-combustible or ignition resistant material; or constructed of solid core wood having stiles and rails not less than 1⅜ inches thick with interior field panel thickness no less than 1¼ inches thick.

18. Vinyl window assemblies are deemed acceptable if the windows have the following characteristics:
    - Frame and sash are comprised of vinyl material with welded corners
    - Metal reinforcements in the interlock area
    - Glazed with insulating glass, annealed, or tempered (one layer of which must be tempered glass)
    - Frame and sash profiles are certified in AAMA Lineal Certification Program
    - Certified and labeled to ANSI/AAMA/NWWDA 101/LS2-97 for Structural Requirements

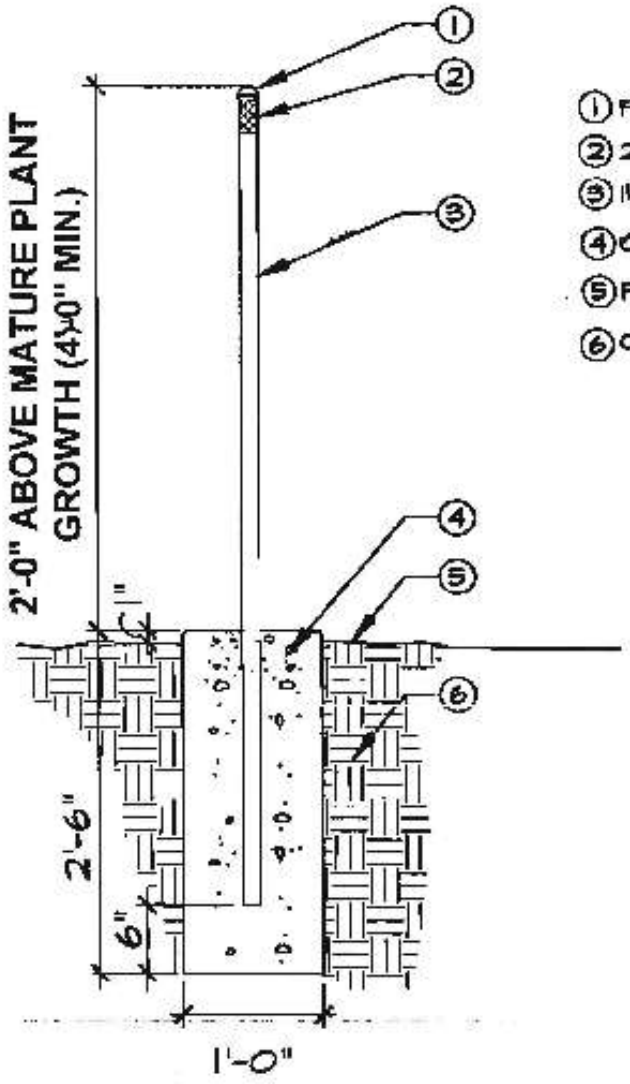
19. The underfloor area of elevated or overhanging buildings and appendages shall be enclosed to grade and shall be protected by non-combustible material, ignition resistant material, one layer of 5/8 inch Type X gypsum on the underside exterior, or 1-hour fire resistive exterior wall assembly applied to the underside of the exposed underfloor. Heavy timber structural columns and beams are exempt.

20. The walking surface material of decks, porches and stairs shall be constructed of one of the following: ignition resistant material that complies with both SFM Standard 12-7A-4 & 5; exterior fire-retardant wood; non-combustible material; any material that complies with SFM Standard 12-7A-4 when attached exterior wall covering is also either non-combustible or ignition resistant material.

21. Detached accessory structures located less than 50 feet from a building containing habitable space shall be constructed in accordance with Chapter 7A of the California Building Code.

22. All attached fences, gate assemblies (fences, gate, and gate posts), arbors, trellises, patio covers, carports and similar structures shall be of non-combustible or ignition resistant materials.

APPENDIX ‘F’

Zone Marker Detail

ZONE MARKER DETAILS