Appendix J:

Fuel Modification Plan

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VICINITY MAP



PLAN SHEET SET

SHT NO.	DESCRIPTION
CMF-1	Title Sheet
CMF-2	Fuel Modification Layout
CMF-3	Attachments
CMF-4	Site Photos

NOTES

- PROJECT IS LOCATED IN A LRA-HFHSZ
- COVENANTS WILL BE REQUIRED TO BE RECORDED FOR THE FMZ AND RPZ LOCATED ON PRIVATE HOMEOWNER LOTS PRIOR TO PRECISE FUEL MODIFICATION PLAN APPROVAL.
- PLANTING PLANS REQUIRE OCFA REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- ALL PLANTS IN FUEL MOD ZONES SHALL BE SELECTED FROM OCFA GUIDELINE C05, ATTACHMENT 8.
- RPZ SHALL NOT HAVE PLANTS FROM ATTACHMENT 7 (UNDESIREABLE AND INVASIVE PLANT SPECIES).
- STRUCTURES IN LRA-HFHSZ MUST MEET CWUIC STANDARDS.
- COMBUSTIBLE FENCING IS PROHIBITED IN ALL FUEL MODIFICATION ZONES

OCFA Approval

FMZ LEGEND

- BUILDINGS
- BOUNDARY LINE
- PAVEMENT
- VEGETATED LANDSCAPE

OWNER:
Meritage Homes

LANDSCAPE ARCHITECT:
C2 Collaborative
100 Avenida Miramar
San Clemente, CA 92672

PREPARED BY:
DUDEK
605 Third Street
Encinitas, CA 92024
(T) 760.942.5147

Contact: Rob Ball
Email: rball@dudek.com

19211 FREEDOM LANE FMP
CONCEPTUAL FUEL MODIFICATION PLAN
TITLE SHEET
ORANGE COUNTY FIRE AUTHORITY

SHEET
CFM-1
1 of 4

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Fuel Modification Notes

IMMEDIATE ZONE:

Within the first five (5) feet of Zone A. No combustible bark or mulch. Remove all dead and dying plants. Plants are irrigated, naturally low growing (2 feet or less), non-woody. No combustible construction. No grouping of shrubs. Single specimen shrubs spaced 15 feet apart.

ZONE A:

Irrigated zone 5'-20' from structures. No combustible construction. No grouping of shrubs. Single specimen shrubs spaced 15 feet apart. Tree limbs are a minimum of 10 feet from structures. Plants must be highly fire-resistant, selected from the Fuel Modification Zone Plant List, or similar species. No undesirable or invasive plant species.

ZONE B :

Minimum 50' from Zone A. Irrigated zone with automatic irrigation to maintain high-moisture vegetation. Planted with approved species from the Fuel Modification Zone Plant List or similar species. Must comply with planting and maintenance requirements from Attachment 6. No combustible construction. No undesirable or invasive plant species.

ZONE C :

Minimum 50' from Zone B. Non-irrigated. Shrub and tree coverage up to 50% throughout. Plant spacing and clearance per Attachment 6 within 100 feet of structures. Planted with approved species from the Fuel Modification Zone Plant List or similar species. No combustible construction. No undesirable or invasive plant species.

ROADSIDE PROTECTION ZONE (RPZ):

Minimum 50' from road edge. Complies with Zone B requirements. When RPZ is within 100 feet of a structure, the RPZ is treated as defensible space and must comply with state regulations.

SPECIAL MAINTENANCE AREAS (SMA):

Minimum 50' irrigated zone. Measured from the property line of privately owned lots. Comply with Zone B requirements.

ZONE IDENTIFICATION MARKER:

Permanent markers that identify the boundary between zones. Specifications are a 2" diameter X 8'-0" long galvanized pipe embedded minimum 2'-6' into the ground. Exposed pipe is a minimum of 4' above the ground and 2' above mature plant growth. Top of pipe is finished with a 2"x5" zone indicator.

OCFA REQUIRED NOTES

- THE OWNER/DEVELOPER WILL OBTAIN PLANTING PLAN APPROVAL FROM OCFA
- BEFORE FINAL APPROVAL FROM ANY OTHER PERMITTING AGENCY.
- FMZ, SMA, AND RPZ AREAS ARE PURCHASED/DEDICATED FOR WILDFIRE MAINTENANCE, BEAUTIFICATION, AND EROSION CONTROL.
- THE DEVELOPER MUST ENSURE THE HOA DUES COVER FUTURE MAINTENANCE COSTS.
- IF ZONE "A" IS ON HOMEOWNER LAND BUT OTHER MAINTENANCE AREAS ARE ON HOA/COMMON LAND, THE HOMEOWNER MUST SIGN A DISCLOSURE REFERENCING THE LOT NUMBER IN CC&RS.
- FMZ, SMA, AND RPZ MUST BE MAINTAINED IN PERPETUITY FOR FIRE SAFETY BY HOA PER CC&RS, PROPERTY TITLES, AND RECORDED EASEMENTS.
- PRIOR TO DROPPING LUMBER, CALL FOR A VEGETATION CLEARANCE INSPECTION; COMBUSTIBLE VEGETATION MUST BE REMOVED AT LEAST 100 FEET FROM STRUCTURES AND LUMBER STOCKPILES.

FMZ LEGEND

- STRUCTURE
- IMMEDIATE ZONE: 0'-5' FROM STRUCTURE, IRRIGATED, NO COMBUSTIBLE CONSTRUCTION
- ZONE A: 5'-20' FROM STRUCTURE UNLESS CONSTRICTED BY PROPERTY LINE, IRRIGATED, NO COMBUSTIBLE CONSTRUCTION
- ZONE B: 20'-70' FROM STRUCTURE UNLESS CONSTRICTED BY PROPERTY LINE, IRRIGATED, NO COMBUSTIBLE CONSTRUCTION
- ZONE C: 70'-120' FROM STRUCTURE UNLESS CONSTRICTED BY PROPERTY LINE, NON-IRRIGATED, NO COMBUSTIBLE CONSTRUCTION
- ROADSIDE PROTECTION ZONE: 50' FROM ROAD EDGE, IRRIGATED
- SPECIAL MAINTENANCE AREAS: OUTSIDE INDIVIDUAL LOTS. MINIMUM 50' IRRIGATED ZONE.
- ZONE IDENTIFICATION MARKERS

OWNER:

Meritage Homes

LANDSCAPE ARCHITECT:

C2 Collaborative
100 Avenida Miramar
San Clemente, CA 92672

PREPARED BY:

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Contact: Rob Ball
Email: rball@dudek.com

19211 FREEDOM LANE FMP

CONCEPTUAL FUEL MODIFICATION PLAN

FUEL MODIFICATION LAYOUT

ORANGE COUNTY FIRE AUTHORITY

SHEET

CFM-2

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ATTACHMENT 1

New Construction Inspection Requirements

The Builder or Developer shall call OCFA Inspection Scheduling at (714) 573-6150 for the inspections listed below:

Vegetation Clearance Inspection:
Prior to dropping of lumber on the site, all combustible vegetation must be cleared at least **100 feet** from:

- Structures under construction
- Lumber stockpiles
- Generators
- Fuel tanks and dispensers

Note: An inspection sign-off or release letter must be issued to the Building Department before construction proceeds.

Final Fuel Modification Inspection:
Prior to occupancy:

- All FMZ, SMA, and RPZ adjacent to structures must:
  - Be fully installed
  - Have functional irrigation
  - Match the approved Fuel Modification Plan specifications
- Physical installation includes:
  - Zone markers
  - Required planting
  - Access paths
  - Hardscape features

Inspection Notes:

- The developer/builder is responsible for scheduling all inspections.
- Any deviation from approved plans must be corrected before final sign-off.
- Inspections will not be passed if undesirable/invasive species (Attachment 7) are found present.

Homeowners Association (HOA) or Landowner Maintenance Acceptance from Developer/Builder:
Schedule an Owner Turnover Inspection – This inspection/ meeting must happen with OCFA staff prior to accepting the maintenance responsibility from the developer or builder.

1. The inspection/meeting must include the following representatives:
   1.1. Landscape architect
   1.2. Community manager or homeowner
   1.3. HOA board member
   1.4. Installing landscape company
   1.5. HOA landscape company
2. At the time of turnover, the Fuel Modification areas shall be maintained by the developer or builder as originally installed and approved.

3. The accepting landowner is responsible for ensuring the developer or builder sufficiently calculated the amount of revenue needed to perform the on-going maintenance of the FMZs and any SMAs per the approved plans.
4. A copy of the approved plans must be provided to the HOA representatives or homeowner at this time.
5. The Landscape Architect must convey ongoing maintenance requirements to HOA representatives or homeowner and provide OCFA a document stating the fuel modification has been installed per plan.
6. An OCFA written disclosure will be required to be signed by the HOA representatives or homeowner indicating that the HOA or homeowner is aware of the FMZ on their land and that they are aware of the importance of retaining the plans and the ongoing maintenance. The responsibility and necessary language for maintenance must also be stated within the CC&Rs (Refer to Attachment 5: Sample CC&R Maintenance Language).

ATTACHMENT 2

Introductory Maintenance Information

The FMZ, SMA, RPZ shall be maintained in perpetuity for fire safety purposes and shall cause a covenant to be recorded and referenced in the CC&Rs or on the property title when there is no HOA involvement.

Emergency access covenants shall be identified on the tract map indicating the reservation and restriction for permanent entry by the HOA or Fire Authority.

On-going maintenance shall occur to preserve the originally approved design found on the approved Fuel Modification Plans.

a. Spacing shall be maintained in accordance with Attachment 6: Requirements for Planting Installation in Fuel Modification Zones. Plant species and arrangements shown on the plans shall be perpetually preserved. Distances of FMZ, SMA, and RPZ will always remain required and will be specific to the approved Fuel Modification Plan.
b. The property owner is responsible for all maintenance of FMZ, SMA, and RPZ.
c. **Two maintenance activities** shall be performed each year, the first during middle- to late-Spring and the second in early- to middle-Fall:
   1) Grasses cut to 4 inches after annual seeding
   2) Dead and dying, all vegetation litter, and Attachment 7: Undesirable and Invasive Plant Species removed from all zones
   3) Maintenance of irrigation systems
   4) Replacement of dead or dying vegetation with approved species (proposed changes shall be approved by OCFA)
   5) Removal of trees and shrubs not on the approved plans
d. If maintained by an HOA, the landscape maintenance company and/or property manager shall inspect the FMZ, SMA & RPZ's throughout the year to identify where specific maintenance activities need to take place.
e. The OCFA may conduct inspections of established fuel modification areas. Ongoing maintenance shall be conducted a minimum of twice each year regardless of the dates of these inspections.
f. The property owner shall retain all approved Fuel Modification Plans. The design and information on the plans shall be used as the basis for maintenance.

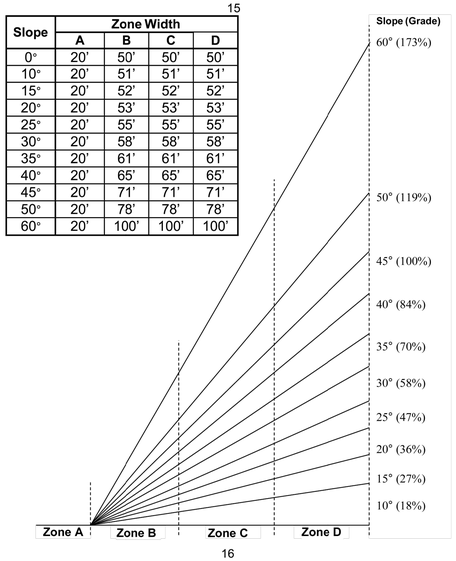
Where there is no approved fuel modification plan, ongoing maintenance of vegetation in wildfire risk areas shall be in accordance with the currently posted OCFA Vegetation Management Recommendations/Requirements for Homeowners document at www.ocfa.org.

ATTACHMENT 3

Incline Measurement for Selected Slopes
(See Attachment 4: Zone Marker Details)

Zone widths described in this guideline are measured horizontally. When zones occur on a slope, the distance measured along the ground will be increased—see the diagram below for examples of effective zone widths at various slopes.

Slope	Zone Width			
	A	B	C	D
0°	20'	50'	50'	50'
10°	20'	51'	51'	51'
15°	20'	52'	52'	52'
20°	20'	53'	53'	53'
25°	20'	55'	55'	55'
30°	20'	58'	58'	58'
35°	20'	61'	61'	61'
40°	20'	65'	65'	65'
45°	20'	71'	71'	71'
50°	20'	78'	78'	78'
60°	20'	100'	100'	100'

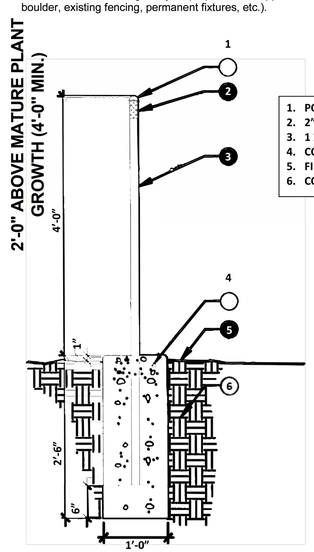


ATTACHMENT 4

Zone Marker Details

Provide zone markers near the property line at the end of each zone and along each zone boundary within the property where needed to provide a clear line-of-sight delineation of the extent of each zone.

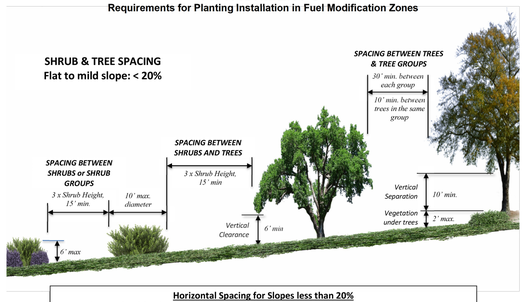
Note: An alternate design may be proposed and approved on a case-by-case basis (e.g., using a large boulder, existing fencing, permanent fixtures, etc.).



1. POST CAP
2. 2"X5" ZONE INDICATOR
3. 1 ½" DIAMETER GALVANIZED POST
4. CONCRETE FOOTING 2500 PSI @ 28 DAYS
5. FINISH GRADE
6. COMPACTED SUBGRADE

ATTACHMENT 6

Requirements for Planting Installation in Fuel Modification Zones



Horizontal Spacing for Slopes less than 20%

Vegetation Less than 2 Feet in Height:

- Classified as ground cover.
- Horizontal spacing and vertical separation not required for ground cover less than 2 feet in height.

Vegetation 2–6 Feet in Height:

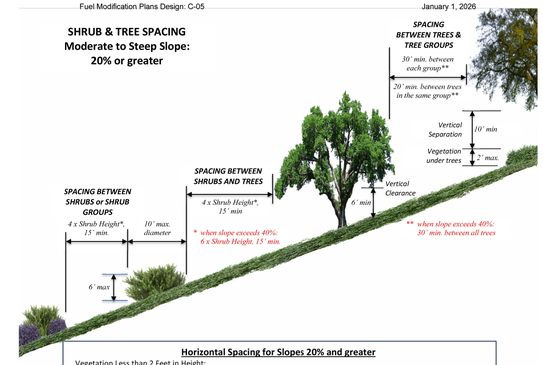
- Classified as shrubs.
- Groups of shrubs are limited to a maximum aggregate diameter of 10 feet.
- Groups of shrubs shall be separated from other shrubs or trees by 15 feet or 3x the height of the tallest specimen. The greater distance shall take precedence.
- Groups of shrubs shall be spaced a minimum of 30 feet from structures.
- No shrubs allowed within 5 feet of combustible structures.
- No shrubs allowed within 15 feet of the edge of a tree canopy.

Vegetation exceeding 6 feet in Height:

- Classified as trees
- 3 trees maximum may be grouped with a minimum 10 foot separation between driplines.
- Groups of trees shall be separated from other tree groups by 30 feet measured from the edge of the dripline.

Vertical Separation

- A vertical separation of 6 feet shall be maintained between ground cover and the lowest branches of trees.



Horizontal Spacing for Slopes 20% and greater

Vegetation Less than 2 Feet in Height:

- Classified as ground cover.
- Horizontal spacing and vertical separation not required for ground cover less than 2 feet in height.

Vegetation 2–6 Feet in Height:

- Classified as shrubs.
- Groups of shrubs are limited to a maximum aggregate diameter of 10 feet.
- Groups of shrubs shall be separated from other shrubs or trees by 4x the height of the tallest specimen.
  Note: when slope exceeds 40%, spacing shall be 6x shrub height
- Groups of shrubs shall be spaced a minimum of 30 feet from structures.
- No shrubs allowed within 5 feet of combustible structures.
- No shrubs allowed within 15 feet of the edge of a tree canopy.

Vegetation exceeding 6 feet in Height:

- Classified as trees
- 3 trees maximum may be grouped with a minimum 20 foot separation between driplines.
- Groups of trees shall be separated from other tree groups by 30 feet measured from the edge of the dripline.
  Note: when slope exceeds 40%, all trees shall be spaced at 30'

Vertical Separation

- A vertical separation of 6 feet shall be maintained between ground cover and the lowest branches of trees.

ATTACHMENT 7

Undesirable and Invasive Plant Species

Certain plants are considered to be undesirable and invasive due to their physical or chemical characteristics. Physical properties that would contribute to high flammability include large amounts of dead material retained within the plant, rough or peeling bark, and the production of copious amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants are notorious for containing these volatile substances.

Plants with these characteristics shall not be planted in any fuel modification zones or anywhere within the area covered by Alternate Methods & Materials agreements (see Section 4: Alternate Materials & Methods). Should these species already exist within these areas, they shall be removed because of their invasiveness or potential threat they pose to structures.

PLANT SPECIES (MANDATORY REMOVAL)

Botanical Name	Common Name
Adenostoma Fasciculatum	Chamise
Adenostoma Sparsifolium	Red Shanks
Anthemix Cotula	Mayweed
Artemisia Californica	California Sagebrush
Brassica Nigra	Black Mustard
Brassica Rapa	Wild Turnip, Yellow Mustard, Field Mustard
Cardaria Draba	Hoary Cress, Perennial Peppergrass
Cirsium Vulgare	Wild Artichoke
Conyza Canadensis	Horseweed
Cynara Cardunculus	Artichoke Thistle
Eriogonum Fasciculatum	Common Buckwheat
Heterothaca Grandiflora	Telegraph Plant
Lactuca Serriola	Prickly Lettuce
Nassella/Stipa tenuissima	Mexican Feathergrass
Nicotiana Bigelevil	Indian Tobacco
Nicotiana Glauca	Tree Tobacco
Pennisetum alopecuroides	Fountain Grass
Ricinus Communis	Castor Bean Plant
Sacsola Austails	Russian Thistle/Tumbleweed
Salvia Mellifera	Black Sage
Silybum Marianum	Milk Thistle
Tamarix Ramosissima	Salt Cedar
Urtica Urens	Burning Nettle
Ornamental:	
Arecaceae *(all palm species)	Palms * ***exception: King Palms***
Cycas Revoluta	Sago Palms
Cortaderia	Pampas Grass
Cupressus sp	Cypress
Eucalyptus sp	Eucalyptus
Juniperus sp	Juniper
Pinus sp	Pine

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OWNER:
Meritage Homes

LANDSCAPE ARCHITECT:
C2 Collaborative
100 Avenida Miramar
San Clemente, CA 92672

PREPARED BY:
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19211 FREEDOM LANE FMP

CONCEPTUAL FUEL MODIFICATION PLAN

ATTACHMENTS

ORANGE COUNTY FIRE AUTHORITY

SHEET

CFM-3

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OWNER:
Meritage Homes

LANDSCAPE ARCHITECT:
C2 Collaborative
100 Avenida Miramar
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19211 FREEDOM LANE FMP

CONCEPTUAL FUEL MODIFICATION PLAN

SITE PHOTOS

ORANGE COUNTY FIRE AUTHORITY

SHEET
CFM-4
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Freedom Lane Project
Conceptual Fuel Modification Plan Checklist

Orange County Fire Authority

Community Risk Reduction

1 Fire Authority Road, Building A, Irvine, CA 92602 • www.ocfa.org • 714-573-6100

Vegetation Management Guideline: Technical Design for New Construction Fuel Modification Plans and Maintenance Program

Guideline C-05

Serving the Cities of Aliso Viejo • Buena Park • Cypress • Dana Point • Garden Grove • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods • Lake Forest • La Palma • Los Alamitos • Mission Viejo • Rancho Santa Margarita • San Clemente • San Juan Capistrano • Seal Beach • Santa Ana • Stanton • Tustin • Villa Park • Westminster • Yorba Linda • and Unincorporated Areas of Orange County

FUEL MODIFICATION PLANS: REQUIRED INFORMATION

Submittals

- All plans shall be submitted electronically through OCFA's Public Services Portal. See the OCFA website and Guideline A-02 for more information on plan submittals.
- A licensed landscape architect or equivalent qualified design professional should prepare fuel modification plans.

Submittal Sequence

- For an individual residential home lot, the Precise Fuel Modification Plan must be approved prior to approval of the Residential Site Plan.
- For commercial or residential developments:
  - The Conceptual Fuel Modification Plan must be approved prior to approval of the Tentative Map.
  - The Precise Fuel Modification Plan must be approved prior to approval of the Fire Master Plan or, where a Conceptual Fuel Modification Plan is not submitted, prior to approval of the Tentative Map.

Section 1: Conceptual Fuel Modification Plans

Include the following information on your plans, as applicable:

Project Details

- ☐ Show total development size with tract boundary lines, property lines, slope contour lines, and structure foundation footprints.
- ☐ Identify adjoining land uses on all sides (e.g., existing structures, HOA maintained properties, open space, vacant lots, natural vegetation, roads, parks).
- ☐ Identify each fuel modification zone within your property (A, B, C & D) as it applies to your project.
- ☐ State whether the project is in an LRA–VHFHSZ, LRA–HFHSZ or SRA.
- ☐ Note on plan: "Structures in these zones must meet CWUIC standards."
- ☐ Note on plan: "Combustible fencing is prohibited in all Fuel Modification Zones."

Topography & Setbacks

- ☐ Show contour lines for slopes and valleys.
- ☐ Identify slopes 20% or greater

Plant Selection

- ☐ All plants must be from the Fuel Modification Zone Plant List (Attachment 8) or follow Section 3 for alternate species.
- ☐ Show the name and location of any retained existing plants (if none, remove all existing vegetation from the plan).
- ☐ Label all interior slopes and common areas as "SMA" or "RPZ".
- ☐ If SMA planting plans are not yet designed, note that they require review and approval before installation.

RPZ Specifications

☐ Delineate RPZ areas with either:
- Max 50-foot-wide irrigated Zone “B” (if on community perimeter)
- SMA designation (if interior to the community)

Legend & Maintenance Notes

☐ Clearly symbol and reference each FMZ, SMA, and RPZ in a legend.
☐ Note each area is irrigated (automatic irrigation) or non-irrigated as required.
☐ Identify who is responsible for the maintenance of FMZ, SMA, and RPZ.

Access & Covenants

☐ Design emergency/maintenance access paths from street frontage to lettered lots:
- At least every 500 feet of FMZ/SMA length
- 7-foot clear width, flat path

☐ Record covenants for FMZ/SMA access and maintenance with planning maps and CC&Rs.
☐ Note: FMZ, SMA, and RPZ on private lots require recorded easements before plan approval.

Required Plan Inserts

☐ Include:
- Attachment 1: New Construction Inspection Requirements
- Attachment 2: Introductory Maintenance Information
- Attachment 3: Incline Measurement for Selected Slopes
- Attachment 6: Planting Installation Requirements
- Attachment 7: Undesirable/Invasive Plant Species

Special Conditions

☐ If Fuel Modification distance requirements cannot be met, follow Alternate Materials & Methods submittal instructions (Section 4).
☐ If other agencies restrict vegetation management (e.g., Coastal Commission, Army Corps, Habitat Management Plan), provide their name, maintenance scope, and management plan.

Required Notes to Copy onto Plans (1–6)

1. The owner/developer will obtain planting plan approval from OCFA before final approval from any other permitting agency.
2. FMZ, SMA, and RPZ areas are purchased/dedicated for wildfire maintenance, beautification, and erosion control.
3. The developer must ensure the HOA dues cover future maintenance costs.
4. If Zone “A” is on homeowner land but other maintenance areas are on HOA/common land, the homeowner must sign a disclosure referencing the lot number in CC&Rs.
5. FMZ, SMA, and RPZ must be maintained in perpetuity for fire safety per CC&Rs, property titles and recorded easements.
6. Prior to dropping lumber, call for a Vegetation Clearance Inspection; combustible vegetation must be removed at least 100 feet from structures and lumber stockpiles.

Additional Requirements

- ☐ Provide CC&Rs confirming maintenance responsibilities before conceptual plan approval.
- ☐ Provide photographs of existing vegetation.
- ☐ Show slope degree/percentage at zone markers to determine actual distance (per Attachment 3).

Section 2: Precise Fuel Modification Plans

Include the following on your Precise Plan:

☐ **Include Conceptual Plan requirements** if no Conceptual Fuel Modification Plan was previously approved, provide additional details from section 1 listed above.

☐ **Show permanent zone marker locations**:

- Install the minimum number needed to clearly define side property lines and where Zone D ends
- See Attachment 4 – Zone Marker Details for reference

☐ **Copy onto the plans**:

- Attachment 4 – Zone Marker Details (if applicable)
- Attachment 5 – Sample CC&R Maintenance Language (if applicable)

Note: Attachments 4 & 5 are in addition to Attachments required on Conceptual Plan

☐ **Provide written proof** that CC&Rs reference fuel modification areas, maintenance responsibilities, and restrictions (see Attachment 5).

☐ **Provide recorded documentation** showing Fuel Modification Zones, SMAs, RPZs, and access/maintenance points are recorded on Tentative Tract Maps.

☐ **Provide note indicating "irrigated" or "non-irrigated" zones**

☐ **Submit planting plans** for FMZ, SMA, and RPZ (see Section 5).

☐ **Plant Palette Legend:** For each plant category, provide the information indicated in the Sample #1: Plant Legend below. See Attachment 8 for plant # and Symbol Code.

Sample #1: Plant Legend

Plant Form	Plan Symbol	Botanical Name	Common Name	Plant # from Attach 8	Symbol Code from Attach 8	Expected Max Growth Height	Expected Max Growth Width
TREES							
Plant Form	Plan Symbol	Botanical Name	Common Name	Plant # from Attach 8	Symbol Code from Attach 8	Expected Max Growth Height	Expected Max Growth Width
SHRUBS							
Plant Form	Plan Symbol	Botanical Name	Common Name	Plant # from Attach 8	Symbol Code from Attach 8	Expected Max Growth Height	Expected Max Growth Width
GROUND COVER							
Plant Form	Plan Symbol	Botanical Name	Common Name	Plant # from Attach 8	Symbol Code from Attach 8	Expected Max Growth Height	Expected Max Growth Width
GRASSES							
SPECIES NOT ON ATTACH 8	Plan Symbol	Botanical Name	Common Name			Expected Max Growth Height	Expected Max Growth Width

ORANGE COUNTY FIRE AUTHORITY

ALTERNATE MATERIALS, DESIGN & METHODS REQUEST

AM&M

SECTIONS A, B & C TO BE COMPLETED BY OWNER OR AUTHORIZED REPRESENTATIVE

A. APPLICANT INFORMATION		B. PROJECT INFORMATION	
OWNER'S NAME: Meritage Homes		PROJECT NAME: Freedom Lane Residential Project	
APPLICANT'S NAME: Dudek		PROJECT ADDRESS: Freedom Lane, Aliso Viejo	
APPLICANT'S PHONE NUMBER: 916-594-1371		OCCUPANCY CLASSIFICATION: R-3	CONSTRUCTION TYPE: V-B
APPLICANT'S EMAIL: RBall@Dudek.com		NUMBER OF STORIES: 2	TOTAL FLOOR AREA:

C. PROJECT REQUIREMENTS & PROPOSALS – Attach supporting documents if any

CODE REQUIREMENT (identify code section)

Vegetation fuel modification in accordance with Chapter 6 of the 2025 California Wildland-Urban Interface Code and Orange County Fire Authority Guideline C-05 Vegetation Management Guideline: Technical Design for New Construction Fuel Modification Plans and Maintenance Program

CODE DEFICIENCY (provide brief description)

Please see attached document.

ALTERNATIVE PROPOSAL (provide brief description)

Please see attached document.

JUSTIFICATION (explain how the alternative is equal to or exceeds code requirements)

Please see attached document.

The above project does not fully conform to the 2025 California Fire Code. Pursuant to 2025 CFC Chapter 1, Section 104.2, I am requesting approval of an alternative material and/or method of construction to achieve the intent of the provisions of the code and provide at least an equivalent level of protection to that prescribed therein. I understand that approval of this request applies only to this project and shall not be construed as establishing a precedent for other projects. If approved, a copy of this AM&M request form shall be provided on all subsequent plan submittals of this project to the OCFA or Building Department.

SIGNATURE	Fire Protection Planner, Dudek TITLE & COMPANY	Feb 16, 2026 DATE

THIS SECTION TO BE COMPLETED BY OCFA

OCFA

SR #	ASSOCIATED PR CODE

☐ **APPROVED** ☐ **NOT APPROVED**

COMMENTS:

PRINTED NAME

FIRE SAFETY ENGINEER SIGNATURE — DATE

OTHER AHJ CONCURRENCE: ☐ **REQUIRED** ☐ **NOT REQUIRED**

☐ **APPROVED** ☐ **NOT APPROVED** ☐ **FYI**

COMMENTS:

EVALUATED BY:

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AM&M REQUEST

To:	Orange County Fire Authority
From:	Dudek Fire Protection Planning Team
Subject:	Freedom Lane Residential Development – Aliso Veijo
Date:	February 16, 2026
Attachments:	Project Location
	Fire Behavior Modeling Summary
	Fire Behavior Modeling Analysis

Introduction

Dudek was retained by Meritage Homes to provide a Fuel Management Plan for a residential development known as Freedom Lane Residential Development in the City of Aliso Viejo, California within the jurisdiction of the Orange County Fire Authority. The project is located in a California Department of Forestry and Fire Protection Local Responsibility Area High Fire Hazard Severity Zone as determined by fire hazard severity maps approved by the State Fire Marshal and adopted by the City of Aliso Viejo and the Orange County Fire Authority.

While completing the Fuel Modification Plan, it was determined that the project cannot provide the minimum requirement of 170 feet of fuel modification zone defensible space entirely within the project boundary or within the property on which the project is located. As such, Meritage Homes is requesting the approval of alternative materials and methods that provide the same practical effect as on-site vegetation fuel modification zones and provide an equivalent level of protection for the homes and residents that will occupy the project site.

Code Requirement

The 2025 California Wildland-Urban Interface Code (CWUIC), which has been adopted by the City of Aliso Viejo and the Orange County Fire Authority (OCFA), allows fire code officials to require landscape plans that include delineation of fuel management zones for development projects in designated Local Responsibility Area Fire Hazard Severity Zones. OCFA Guideline C-05 Vegetation Management Guideline: Technical Design for New Construction Fuel Modification Plans and Maintenance Program, requires fuel modification plans for development projects in State Responsibility Area (SRA) or Local Responsibility Area – Very High Fire Hazard Severity Zone (LRA-VHFHSZ) and High Fire Hazard Severity Zone (LRA-HFHSZ). Being located in a LRA-HFHSZ, this project is required to provide a fuel modification plan that complies with the requirements of OCFA.

The standard fuel modification zone (FMZ) within the jurisdiction of OCFA is 170 feet wide measured horizontally from the structure outward in all directions. It is divided into Zones A (minimum 20 feet), B, C, and D (minimum 50 feet each), with specific design and maintenance requirements for each zone. Within Zone A is an Immediate Zone that consists of the first 5 feet directly adjacent to the structure.

Code Deficiency

The project is an in-fill residential development in an urbanized area. The required 170 feet of vegetation fuel modification cannot be provided entirely within the project boundary or within the property on which the project is located due to existing development that surrounds the project site.

Alternative Proposals

Meritage Homes is requesting that the existing development north, east, and west of the project site is determined to be equivalent to Fuel Modification Zones A and B and that the slope comprising the southern portion of the project site is determined to exceed fuel modification zone minimum requirements and provide fire hazard reduction equivalent to the intent of OCFA Guideline C-05.

Justifications

The existing development to the north, east, and west of the project site consists of commercial buildings and parking fields with minimal amounts of irrigated landscaping. While the landscaping in the parking fields could be ignited and result in a small vegetation fire, the developed state of the adjacent properties has removed natural and native hazardous vegetation. The adjacent development has created conditions that do not include hazardous vegetation and thus cannot support a wildfire event within 170 feet of the structures proposed for the project site.

The manufactured slope within the southern portion of the project site facilitated the grading that allowed the commercial development south of the project. The narrowest distance from a project building to the bottom of the slope, which is the project boundary and property line, is approximately 95 feet. The slope includes groundcover that can be maintained to less than 2 feet in height, and which is sheared to 4 inches annually in accordance with OCFA guidelines for landscape maintenance. The entire slope is irrigated to support the vegetation that has been planted as a slope stabilization measure. Zone A fuel modification can be provided for all buildings that are adjacent to the slope.

With a maximum grade of 54%, the slope could be required to meet Zone B fuel modification requirements to a distance of 58 feet from the outer edge of Zone A. The distance from the outer edge of Zone A to the bottom of the slope and the property line is 75 feet. With the entire slope being irrigated, the slope meets the requirements for Zone B fuel modification and exceeds the requirements for Zones C and D fuel modification. With a total width of 75 feet, the slope exceeds the maximum width of 58 feet that could be required for Zone B fuel modification.

Fire behavior modeling completed for the project site assessed nearby hazardous fuels and potential ignition sources. The nearest natural and native hazardous vegetation is located approximately 3/4 of a mile to the west adjacent to the residential development on Oak View Drive and the Soka University of America campus and 1/2 mile to the east in the Aliso Creek open space. Wildfires ignited and burning in either area under onshore or offshore winds conditions could carry embers to the project site.

A human-caused vegetation fire could be ignited in the landscaping on the manufactured slope along the west side of Aliso Creek Road and extend into the landscaping on the slope in the southern portion of the project site.

The fire risk assessment completed for this project determined that the highest risk fire would be on the slope in the southern portion of the project site. The worst-case fire conditions would be a fire during an offshore Santa Ana wind event with strong winds from the northeast. Under such wind conditions, the fire would be a flanking fire relative to the project site that would produce flame lengths of only 1.0 feet in the irrigated ground cover with minimal heat energy. The northeast winds would drive a fire on the slope away from the project site. As such, the fire would not present an ignition risk to the structures due to the required Immediate Zone and Zone A fuel modification provided for the project and flames directed away from structures by the offshore wind.

Conclusion

As an in-fill project among existing commercial development, the project is provided with fuel modification equivalent to Zone A and Zone B to a distance greater than 170 feet on the north, east, and west sides of the project site. The irrigated slope on the southern portion of the project site contains maintained irrigated landscaping that provides the required 20 feet of Zone A fuel modification and an additional 75 feet of fuel modification that meets Zone B fuel modification requirements, which exceeds the minimum Zone B width requirement for fuel modification as detailed in OCFA Guideline C-05. South of the slope is commercial development similar to that which exists north, east, and west of the project site and provides fuel modification equivalent to Zone A and Zone B to a distance greater than 170 feet from the project site.

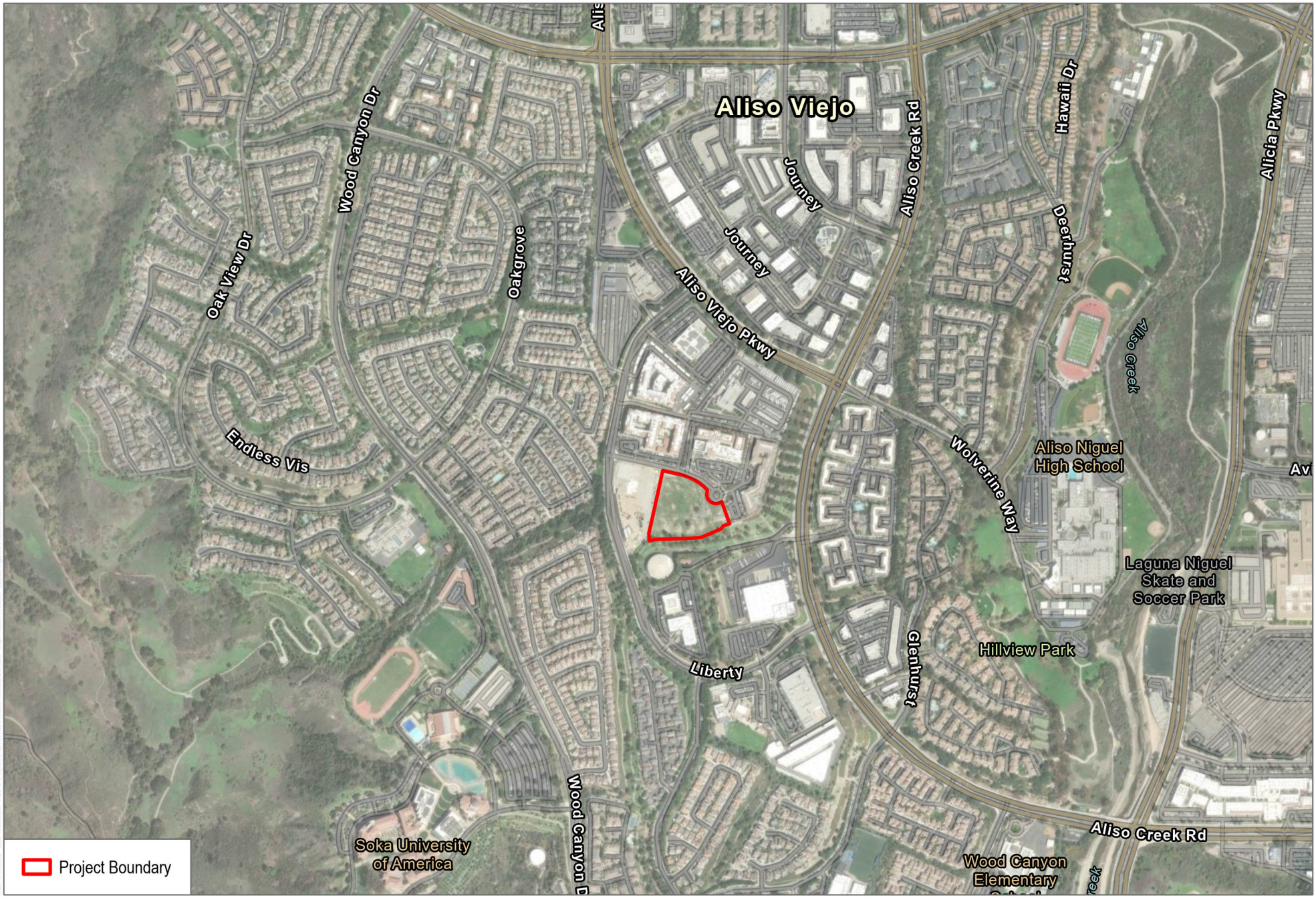
Additionally, the project site is not adjacent to natural and native hazardous vegetation and fire behavior in the irrigated, landscaped open spaces near the project's buildings will not produce flames or heat energy that present a risk of ignition to the buildings.

OCFA is requested to make a finding of fuel modification compliance for this project based on the conditions noted in this AM&M proposal and based on the fire behavior modeling completed for the project site.

This AM&M proposal and is acceptance, should OCFA accept the AM&M equivalency, will be copied onto the Precise Fuel Modification Plan. We appreciate your timely and favorable consideration of this proposal and trust that OCFA finds that the AM&M provides a level of protection equivalent to the prescriptive code requirements. If you have any questions, please contact me at 916-594-1371 or rball@dudek.com.

Rob Ball

Rob Ball
Fire Protection Planner



SOURCE: ESRI Aerial Imagery 2025

DUDEK

0 455 910 Feet

Project Location

Freedom Lane Fuel Modification Plan

Table 1. Project Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet)[1]
FM8	Compact Litter	On-site Zone 1 and 2 fuel modification	0.2 ft.
NB	Non-burnable	Paved areas throughout the proposed Project site.	0 ft

Table 2. Fuel Model Inputs

Model Variable	Peak Weather (97th Percentile) Offshore Wind
Fuel Models	FM8
1 h fuel moisture	2%
10 h fuel moisture	4%
100 h fuel moisture	8%
Live herbaceous moisture	30%
Live woody moisture	59%
20 ft. wind speed	19 mph sustained winds with wind gusts of 30 mph
Wind Directions from north (degrees)	69
Wind adjustment factor	0.3
Slope	3-7%

Table 3. Fire Behavior Model Results

Fire Scenario	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Flanking fire spread east to west across south aspect slope with irrigated landscaping; Extreme 97th percentile offshore Santa Ana winds with 30 mph wind gusts.				
Compact Litter (FM8) (Off-site) Flanking (54%)	1.0	5	0.02	N/A[2]

Note:

1 Wind-driven surface fire.

2 Spotting distance is not calculated for flanking fires.



SOURCE: Dudek CAD Team

Fire Behavior Modeling Analysis

1 Introduction

Fire behavior modeling has been used by researchers for approximately 50+ years to predict how a fire will move through a given landscape (Linn 2003). The models have had varied complexities and applications throughout the years. One model has become the most widely used as the industry standard for predicting fire behavior on a given landscape. That model, known as "BEHAVE", was developed by the U. S. Government (USDA Forest Service, Rocky Mountain Research Station) and has been in use since 1984. Since that time, it has undergone continued research, improvements, and refinement. Numerous studies have been completed testing the validity of the fire behavior models' ability to predict fire behavior given site specific inputs. One of the most successful ways the model has been improved has been through post-wildfire modeling (Brown 1972, Lawson 1972, Sneeuwjagt and Frandsen 1977, Andrews 1980, Brown 1982, Rothermel and Rinehart 1983, Bushey 1985, McAlpine and Xanthopoulos 1989, Marsden-Smedley and Catchpole 1995, Grabner et. al. 1997, Alexander 1998, Grabner et al. 2001, Arca et al. 2007). In this type of study, Behave is used to model fire behavior based on pre-fire conditions in an area that recently burned. Real-world fire behavior, documented during the wildfire, can then be compared to the prediction results of Behave and refinements to the fuel models incorporated, retested, and so on.

Fire behavior modeling conducted on this site includes a relatively high-level of detail and analysis which results in reasonably accurate representations of how wildfire may move through available fuels on and adjacent to the property. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths, spread rates, and fireline intensities, this analysis incorporated predominant fuel characteristics, slope percentages, and representative fuel models observed on site. The BehavePlus fire behavior modeling system was used to analyze anticipated fire behavior in key areas within and adjacent to the proposed Project site. Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information.

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

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

BehavePlus software requires site-specific variables for surface fire spread analysis, including fuel type, fuel moisture, wind speed, and slope data. The outputs produced by this analysis include flame length measured in feet, rate of spread measured in miles/hour, fireline intensity measured in BTU/feet/second, and ember spotting distance measured in miles. The following provides a description of the input variables used in processing the BehavePlus models for the Project site. In addition, data sources are cited and any assumptions made during the modeling process are described.

2 Fire Behavior Modeling Inputs

Dudek utilized the BehavePlus software package to analyze fire behavior potential for the Freedom Lane Residential Project in Aliso Viejo, California. For this analysis, a fire burning on the slope in the southern portion of the project site was evaluated under critical fire weather conditions that include high temperatures, high offshore Santa Ana winds, and low relative humidity. The slope is fully irrigated and has maintained vegetation cover that consists of maintained groundcover and trees of various species and heights, all of which supports slope stabilization. The vegetation mostly closely resembles BehavePlus vegetation fuel model FM8.

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower fire spread down-slope in the absence of wind. Flat terrain tends to have little effect on fire spread, resulting in fires that are driven by wind. The project site is relatively flat, however, the slope in the southern portion of the project site has slopes up to 54% and is the location of the modeled fire.

Historical weather data for Aliso Viejo was utilized in determining appropriate fire behavior modeling inputs for the project site. Weather conditions were derived from Remote Automated Weather Stations (RAWS) data. The ALISO CANYON RAWS Station (RAWS ID 045509) was utilized to find extreme weather values for the project site. The station is approximately 2.25 miles west of the project site and adequately approximates project site weather conditions. Data from fire seasons dating back to 2016 and up through 2025 were included in the analysis.

RAWS fuel moisture and wind speed data were processed utilizing the Fire Family Plus software package to determine atypical 97th percentile weather conditions, which is typical for critical fire weather that consists of high temperatures, strong offshore winds, and low humidity. Data from the RAWS was evaluated from August 1 through December 31 for each year between 2016 and 2025 for 97th percentile weather conditions.

An analysis utilizing the BehavePlus software package was conducted to evaluate fire behavior variables and to objectively predict flame lengths measured in feet, fireline intensities measured in BTU/feet/second, rate of spread measured in feet per minute, and ember spotting distance, measured in miles.

Modeling was completed for the worst-case scenario, which is a fire burning in the landscaped and irrigated slope on the south side of the Project site under critical fire weather conditions including high temperatures, low humidity, and offshore Santa Ana winds from the east. The Santa Ana winds create a flanking fire relative to the Project site, forcing fire spread across the slope rather than up or down the slope. This type of fire would typically spread relatively slowly towards the western portions of the residential development site.

The fuel model characteristics used for the fire behavior modeling for this project are shown in Table 1 below. Fuel moisture and wind inputs for the fire behavior modeling are shown in Table 2.

Table 1. Project Fuel Model Characteristics

Fuel Model Assignment	Vegetation Description	Location	Fuel Bed Depth (Feet)[1]
FM8	Compact Litter	On-site Zone 1 and 2 fuel modification	0.2 ft.
NB	Non-burnable	Paved areas throughout the proposed Project site.	0 ft

Table 2. Fuel Model Inputs

Model Variable	Peak Weather (97th Percentile) Offshore Wind
Fuel Models	FM8
1 h fuel moisture	2%
10 h fuel moisture	4%
100 h fuel moisture	8%
Live herbaceous moisture	30%
Live woody moisture	59%
20 ft. wind speed	19 mph sustained winds with wind gusts of 30 mph
Wind Directions from north (degrees)	69
Wind adjustment factor	0.3
Slope	3-7%

3 Fire Behavior Modeling Results

The fire behavior modeling results presented in Table 3 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis; rather, the models provide a worst-case wildfire behavior condition as part of a conservative approach. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns.

Table 3. Fire Behavior Model Results

Fire Scenario	Flame Length[1] (feet)	Fireline Intensity[1] (BTU/feet/ second)	Spread Rate[1] (mph)	Spotting Distance[1] (miles)
Flanking fire spread east to west across south aspect slope with irrigated landscaping; Extreme 97th percentile offshore Santa Ana winds with 30 mph wind gusts.				
Compact Litter (FM8) (Off-site) Flanking (54%)	1.0	5	0.02	N/A[2]

Note:

1 Wind-driven surface fire.

2 Spotting distance is not calculated for flanking fires.

The flanking fire across the slope is expected to produce low fire behavior with flame lengths of 1.0 feet, fireline intensity of 5 BTU/feet/second, and a spread rate of 0.02 miles per hour. BehavePlus does not calculate ember spotting distance for flanking fires. The short flame lengths do not present an ignition hazard to the structures given that the structures will have a 5-foot Immediate Zone defensible space fuel modification zone.

4 Project Area Fire Risk Assessment

Wildfires are a common natural hazard in most of Southern California with a long and extensive history (Keeley & Syphard 2021). Southern California landscapes include a diverse range of plant communities, including vast tracts of shrublands and grasslands, like those found on and/or adjacent to the Project development site. Wildfire in this Mediterranean-type ecosystem ultimately affects the structure and functions of vegetation communities (Keeley 1984) and will continue to have a substantial and recurring role (Keeley & Fotheringham 2003). Supporting this are the facts that native landscapes, from forest to grasslands, become highly flammable each fall. The climate of Southern California has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds occurring during autumn after a six-month drought period each year. Based on this research, the anticipated growing population expanding into WUI areas, and the regions' fire history, it can be anticipated that periodic wildfires burn near or spot into the Project site. The most common type of fire anticipated

in the vicinity of the development area is a wind-driven fire from the northeast or southwest moving through the irrigated landscaping on the slope that forms the southern portion of the Project site.

With the conversion of the landscape to ignition-resistant development, wildfires may still drop embers on the Project site but would not be expected to burn through the Project site. Studies indicate that even with older developments that lacked the fire protections provided for the Project, wildfires declined steadily over time (Syphard, et. al. 2007 and 2013) and further, the acreage burned remained relatively constant, even though the number of ignitions temporarily increased. This is due to the conversion of landscapes to ignition-resistant, maintained areas, more people monitoring areas resulting in early fire detection and a reduction in arson, and faster notification of fire suppression resources that are located within the urban environment.

Therefore, it will be important that the latest fire protection technologies, developed through intensive research, real-world wildfire observations, and findings by fire professionals, for both ignition-resistant construction and for creating defensible space in the ever-expanding WUI areas, are implemented and enforced. The Project, once developed, would not facilitate off-site wildfire spread and would produce flame lengths that would be manageable by firefighting resources, especially given the planned ongoing maintenance of the landscaping throughout the Project site.

Given the climatic, vegetative, and topographic characteristics, along with the local fire history of the area, the Project site, once developed, is anticipated to experience periodic wildfires nearby and possibly spot into the development. The potential for off-site wildfire showering embers into the site is considered low and the risk of ignition from such encroachments or ember showers is considered low given the ignition-resistant construction and landscaping, along with fire protection features that will be provided for the structures. A more probable ignition source is human activity that ignites a fire in roadside, on-site, or off-site ornamental landscaping.

While it is true that humans are the cause of most fires in California, there is no data available that links increases in wildfires with the development of ignition-resistant communities or projects. The Project will include fire prevention policies and features that reduce the risk of ignitions and prevent on-site fire from spreading to off-site vegetation.

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