

## IDENTIFYING HAZARDS FOR A SPECIFIC SITE

Wildfire criteria may apply anywhere in the country where a building is located in proximity to wildfire-prone areas. Applicability is determined by a site-specific fire hazard severity zone (FHSZ) assessment of vegetation, topography, fire history and other factors. Businesses can request their FHSZ rating and other relevant information from local building or fire officials in their area. Such assessments may also be conducted using the RECOMMENDATIONS sections below, which contain descriptions of “moderate,” “high,” and “extreme” (sometimes also referred to as “very high”) wildfire hazard zones. If it is determined that a building is in one of these zones, the building should be built or maintained in accordance with the program recommendations associated with that hazard zone. (Note: The guidance in this document does not apply in downtown urban areas.)

## WILDFIRE-SPECIFIC DESIGN GUIDANCE

Because many designers are not as familiar with wildfire hazards, as compared to other perils, this guide provides background information and describes a coupled approach to addressing wildfire hazards which deals with both the building and surrounding vegetation. Specific design recommendations for various wildfire hazard levels are provided following the Background and Definitions section below.

## BACKGROUND AND DEFINITIONS

Building ignitions during wildfires occur when a component of a building is exposed to one or more of the three basic wildfire exposures: burning embers (also called rebrands), direct flame contact, and radiant heat.

Since the roof is a large surface that may be either almost horizontal or have a relatively low slope, burning embers

## RISKS ASSOCIATED WITH BURNING EMBERS

Burning embers are the most frequent cause of building ignitions. They can ignite nearby vegetation or accumulated debris, or enter the building through openings, such as an open window or attic vent. Once inside, embers can ignite furnishings or other combustible materials and accumulated debris stored in unoccupied spaces, such as an attic. Nearby ignitions can subject some portion of the building to either a direct flame contact exposure, where the flames touch the building, or a radiant heat exposure—the heat you feel when standing near a campfire or fireplace.

## RISKS ASSOCIATED WITH RADIANT HEAT

The vulnerability of a building to radiant heat depends on the intensity and duration of the exposure. If the radiant heat level is high enough, and duration long enough, it can result in the ignition of a combustible product (e.g., wood siding), or it can break the glass in a window. Exposures to lower levels of radi-



Plant characteristics associated with higher combustibility include:

- Narrow leaves or needles (often evergreen)
- Volatile resins and oils, as indicated by leaves that have an aromatic odor when crushed
- Accumulation of fine, twiggy, dry, or dead material on the plant or on the ground under the plant
- Loose or papery bark that often falls off and accumulates on the ground (e.g., palms and eucalyptus)

Plant characteristics associated with lower combustibility include:

- High moisture content in leaves
- Low oil or resin content (little or no aromatic odor when leaves are crushed)
- Drought tolerance or drought resistance (deeply rooted plants with thick, heavy leaves)
- Minimal seasonal accumulation of dead vegetation (foliage, twigs, small branches, etc.)
- Open or loose branching habit
- **Plant is short enough to enable easy maintenance and pruning**

Vegetation Management Plan (VMP): A Vegetation Management Plan provides information (narrative and figures) about topography (slope and aspect), location of building(s) on the parcel, proposed fuel treatment details and location, presence of noxious weeds on site and in the vicinity, environmentally sensitive concerns (e.g., threatened and endangered species, as well as state-listed sensitive species)

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- i. Planned landscaping planted adjacent to the building(s) should be irrigated.

have a fire resistance rating of not less than 20 minutes when tested according to UL 9 or NFPA 252. Glazing frames made of vinyl materials should have welded corners, metal reinforcement in the interlock area (i.e., at the horizontal meeting rail in a hung window, vertical member in a casement windows), and be certified to ANSI/AAMA/NWDA 101/I.S.2-97 structural requirements.

- b. Gutters should incorporate a noncombustible gutter cover device. If the roof slope allows, the gutter cover device should be installed so that it is parallel to the plane of the roof slope (with

## RECOMMENDATIONS: MODERATE FIRE HAZARD SEVERITY ZONE AREAS

Moderate Fire Hazard Severity Zones have the following conditions:

- The area has been designated as a moderate (or lower) hazard area by local or state authorities
- Flat terrain with no grades greater than 9%
- Limited wildland or conservation area exposure
- No known history of wildfires in the area
- 1. Additional Building Recommendations beyond those required for all zones:
  - The exterior siding is not restricted in this fire hazard severity zone
  - No additional recommendations
- 2. Additional Parcel/Surroundings Recommendations beyond those required for all zones:
  - No additional recommendations.

## RECOMMENDATIONS: HIGH FIRE HAZARD SEVERITY ZONE AREAS

High Fire Hazard Severity Zones have the following conditions:

- The area has been designated as a High or Significant hazard area by local or state authorities
- Hilly terrain with grades that average 10%–20%
- Has a shared border with a wildland or conservation area consisting of forested, shrub or chaparral vegetation within 100 ft of the site
- A history of wildfires in the area
- 1. Additional Building Recommendations beyond those required for all zones and the Moderate Fire Hazard Severity Zone:
  - a. Exterior windows, window walls, glazed doors, and glazed openings within exterior doors should be insulating-glass units with a minimum of one tempered pane, or glass block units, or

- Liquefied propane (LP) tanks should be located at least 50 ft from the building and other structures on the property. Acceptable alternatives include the following: (1) create a 10 ft noncombustible (rock, gravel, mulch or irrigated lawn) zone around the tank, (2) enclose the tank using noncombustible materials, or (3) unless otherwise prevented by the local AHJ, bury the tank following requirement in NFPA 58 or FM Global Property Loss Prevention Datasheet 7-55.
- b. Buildings and structures should be set back a minimum of 30 ft from any property line adjacent to a national forest, state park, open space preserve or other protected wildland.
- c. Any fire hydrants should be located within 250 ft of the building connected to a reliable public or private water supply.
- c. Attached decks, such as a balcony or porch, should meet one of the following criteria:
  - Should consist of a noncombustible solid surface decking (e.g., lightweight concrete with noncombustible top surface), and enclosed on the underside of the deck with the enclosure material being attached to the underside of the deck support structure.
  - Should consist of a combustible decking product that complies with the requirements of Chapter 7A of the California Building Code.
  - For slopes greater than 20%, a 6 ft tall noncombustible wall (e.g., concrete block, or stone) should be located on the downslope side of each attached deck, located between 20 ft and 30 ft from the outer edge of the deck and extending along the side of the building to which the deck is attached.

## RECOMMENDATIONS: EXTREME (VERY HIGH) FIRE HAZARD SEVERITY ZONE AREAS

Extreme Fire Hazard Severity Zones have the following conditions:

- The area has been designated as an extreme, severe or very high hazard area by local or state authorities.
- Steep-sloped terrain with grades that average more than 20%.
- Has a shared border with a wildland or conservation area consisting of forested, shrub or chaparral vegetation within 100 ft of the site.
- A history of wildfires in the area.

Recommendations and those specified for the Moderate and High Fire Hazard Severity Zones should also be incorporated with those specified for this hazard zone.

### 1. Additional Building Recommendations beyond those required for all zones and the Moderate and High Fire Hazard Severity Zones:

- a. Exterior wall assemblies should be clad with a noncombustible material in accordance with ASTM E 136, or with the exception of exterior-rated, pressure-impregnated fire-retardant-treated shakes or shingles, rated as an ignition-resistant material.
- b. Floor projections should maintain the fire resistance of the exterior walls, or the projections should be enclosed to the grade.

- d. Exterior windows, window walls, glazed doors, and glazed openings within exterior doors should be insulating-glass units with tempered glass, have glass block units, or have a fire resistance rating of not less than 20 minutes, when tested according to UL 9 or NFPA 80.

### 2. Additional Parcel/Surroundings Recommendations beyond those required for all zones and the Moderate and High Fire Hazard Severity Zones:

- a. For buildings built mid-slope and the slope is greater than 20%:
  - i. For slopes between 21% and 40%, the defensible space recommendations should be increased to 150 ft in the downslope direction, following the recommendations established for the 30- to 100-ft zone.
  - ii. For slopes greater than 40%, the defensible space recommendations should be increased to 200 ft in the down slope direction, following the recommendations established for the 30- to 100-ft zone.