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Protecting Your Business from Wildfire

Wildfires are a risk throughout the U.S. and pose a significant threat to buildings and lives in wildfire-prone areas. As more and more businesses expand into the wildland-urban interface—or WUI, a term used to designate wildfire-prone areas where homes and businesses are also located—the wildfire risk to businesses will also grow. In this environment, business protection must take into account both the materials and design features of the building, as well as the selection, location and maintenance of landscape plants, including grasses, shrubs, bushes and trees. This article provides an overview of wildfire hazards, mitigation strategies, and useful resources developed by IBHS to help you protect your business from the threat of wildfire.

Three Sources of Wildfire Ignition
Most people associate wildfire damage with direct flame contact from the wildfire as it burns past the building. However, buildings also can be damaged or destroyed when they are exposed to burning embers and/or radiant heat. Building ignitions during wildfires occur when a component of a building is exposed to one or more of these three wildfire exposures.

1. **Burning Embers**
   Burning embers (also called firebrands), and wind-blown burning embers in particular, are the most frequent cause of building ignitions. These embers are generated by the burning wildfire itself, as well as by combustible items the wildfire has previously ignited, such as landscape plants, which includes grasses, shrubs, bushes and trees. Importantly, burning embers can travel for long distances before landing on or near a building.

   Embers can ignite buildings in several ways:

   - Embers can ignite combustible construction materials directly when accumulating on or immediately adjacent to them. Combustible construction materials are those that ignite and burn such as wood, plastic, and wood-plastic products used in decking and siding.
   - Embers can ignite nearby plants and accumulated debris such as pine needles or other combustible materials such as a wood pile.
   - Embers can enter a building through openings, such as an open window or attic vent, and ignite combustible items inside the building.

2. **Direct Flame Contact**
   Direct flame contact refers to actual flames from the wildfire coming into contact with buildings or combustible items attached to or near the building.

3. **Radiant Heat**
   Fire generates radiant heat (the heat you feel when standing near an open flame). If it is high enough and the duration is long enough, radiant heat can ignite a combustible product (such as wood siding) or break the glass in a window. Additionally, exposures to lower levels of radiant heat can pre-heat materials, making them easier to ignite from a direct flame contact exposure.

Know Your Fire Hazard Severity Zone
Fire Hazard Severity Zones (FHSZ) represent the wildfire hazard in a particular area based on an evaluation of the plants and landscaping, fire history, slope and other terrain features that may impact the growth and spread of fire. Zones are typically classified as "moderate," "high," or "extreme" (also referred to as "very high").

Businesses can request the FHSZ rating and other relevant information from local building or fire officials in their area. Depending on the construction ordinances in a given community, certain requirements regarding materials and other construction details can be based on the FHSZ, which is also relevant to landscaping, maintenance, and other operational decisions.

Building Construction
From a building code and guidance perspective, building vulnerabilities are generally addressed on a component-by-component basis, and typically include the roof, exterior walls, windows, deck and other attachments, vents and gutters (if present), as well as design features that can affect the vulnerability of a given component.

Roofs

- Since the roof is a large, relatively horizontal surface covering the building, it is often considered the most vulnerable component, particularly from an ember exposure perspective.

- Fire ratings for roof coverings are either Class A, B or C (or, in the case of a non-fire-retardant-treated wood shake covering, not rated). IBHS recommends a Class A covering. For low-slope roofs, a Class A–rated roof cover includes testing and rating of the entire roof system assembly, which includes the roof cover, insulation, vapor or air barriers, and the type of deck. Examples of roof systems considered to be Class A regardless of the deck type include built-up roofing and ballasted single-ply membranes.

- There are a number of Class A–rated steep-slope roof coverings, including asphalt composition shingles, clay tile and steel. Some Class A tile designs provide for an opening at the eave end and ridge. These openings should be plugged with a noncombustible material to minimize entry of embers in the area under the roof covering.

Windows

- Using dual-paned windows with tempered glass will reduce the vulnerability of windows.

- Operational windows should have screens covering those sections that can open.

Vents

- At a minimum, vents should be covered with 1/8-inch noncombustible mesh screening. This will minimize the size of embers that can enter into the attic or crawlspace area.

- Vents that are perpendicular to the flow of wind, such as a gable end vent or those in under-eave blocking, are more vulnerable to ember entry. Ridge vents that are rated to resist the entry of wind-driven rain or vents in boxed-in under-eave construction are better options.

Exterior Walls

- Noncombustible siding materials such as concrete and brick will provide the greatest fire protection from flames, embers, and radiant heat.

- The distance between the ground and the bottom of the siding on the exterior wall affects a building's vulnerability, particularly when walls are made of materials that can ignite. The building code generally calls for 6 inches of clearance between the ground and the start of the siding (see below).

Example of good ground-to-siding clearance.

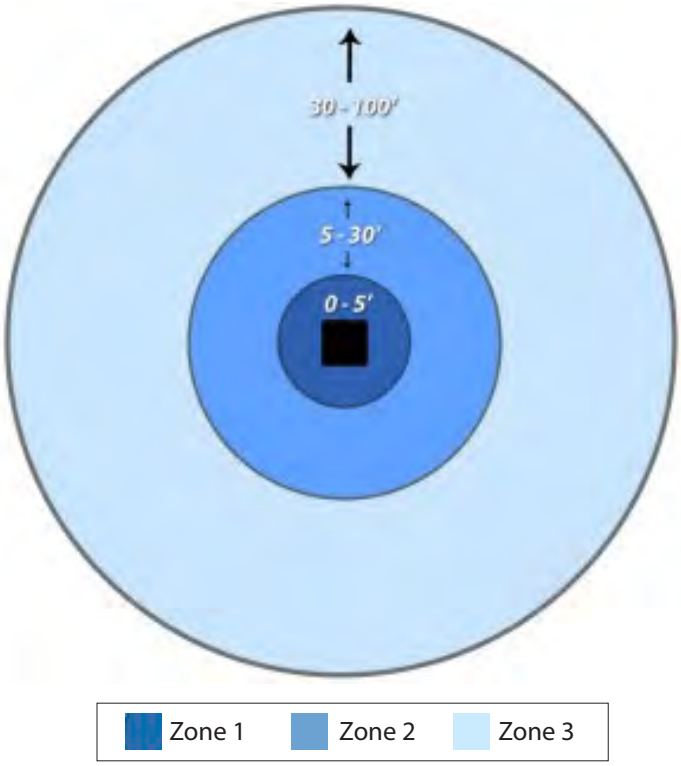
DEFENSIBLE SPACE

What is defensible space? The area between a building and an approaching wildfire, where plants and trees have been managed to reduce the wildfire threat and improve the likelihood of a building surviving without assistance from firefighters (*as described in "Fire Adapted Communities: The Next Step in Wildfire Preparedness," University of Nevada Cooperative Extension, Publication SP-10-10*).

To create defensible space around your business, it's important to understand how plants and other materials should be selected, located and managed around the property. Proper management will reduce the opportunity for the fire (or any spot fires from ember ignitions) to burn to the building, and minimize the chance for radiant heat from ignited plants and other materials to pose a threat to the building.

As seen below, defensible space is usually discussed in terms of zones that extend outward from the building. Each zone has specific recommendations for types of plants, including how they should be grouped and maintained.

Defensible Space Zones
Three zones extend outward from the building, which is represented by the dark square in the center.



Zone 1: 0–5 Feet (also called the near-building, noncombustible or low-combustible zone)
The objective of this zone is to reduce the chance that ignition will result in a direct flame contact exposure to the building. Woody vegetation (such as trees and shrubs) should not be used in this zone. Noncombustible mulches, such as rock mulch, are recommended. Because this zone is closest to the building, it requires the most careful selection and intensive management of plants, shrubs and trees, and other materials.

Zone 2: 5–30 Feet (or to the property line)
The objective of vegetation management in this zone is to reduce the opportunity for fire to climb into the crown or upper portions of trees or shrubs, and to minimize the opportunity for fire to burn directly to the building. Trees and shrubs in this zone should be in well-spaced groupings and well maintained. Eliminate tall grasses, hanging tree branches and other ladder fuels (plants that allow fire to climb up trees), and create separation between plants or plant groupings.

Zone 3: 30–100 Feet (or to the property line)
The objective of this zone is to slow down and reduce the energy of a wildfire. Tree and brush spacing should force fire in tree crowns (or fire in shrub and brush) to drop to the ground. Dead trees and shrubs should be removed. The rate of fire spread and flame length is affected by slope—a steeper slope will result in a faster-moving fire with longer flame lengths.

Vegetation Management Plan
Both naturally occurring plants and species introduced into an area influence the potential for fire to spread to buildings located on the property—with some plants, like junipers, being more likely to ignite than others. Because plants vary greatly from region to region, IBHS provides links to detailed, region-specific information at DisasterSafety.org/ibhs-risks-wildfire/ibhs-regional-wildfire-guides/.

A Vegetation Management Plan (VMP) may be required in certain wildfire-prone areas. A VMP provides important information about the land, such as:

- topography (slope and aspect).
- location of building(s) on the land.
- proposed fuel treatment details (suggested actions such as thinning and prescribed burning to minimize wildfire risks).
- environmental concerns (threatened and endangered species, state-listed sensitive species and wetlands, etc.).

The VMP also provides detailed information on how the three defensible space zones will be developed and maintained. When developing a VMP, consult a landscape professional such as a forester, range manager, or natural resource specialist.

IBHS Resources
IBHS provides specific commercial building construction and site mitigation guidelines for various wildfire hazard levels. This includes detailed information on the roof (including vents and gutters), exterior walls (including windows, doors and the under-eave area), and property information related to yard storage, land parcel/surroundings, entrances, fire hydrants, plant characteristics and combustibility.

The IBHS Best Practices Guide for Wildfire—Commercial Properties, available at DisasterSafety.org/wp-content/uploads/2015/09/Best-Practices-Guide-Wildfire_IBHS.pdf, includes guidelines for reducing wildfire risk, including specific guidance for structures located in moderate, high or extreme wildfire hazard zones. Taking these actions is important for protecting your business and avoiding the further spread of wildfires.

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