

Small Businesses in Residential Style Buildings

PROTECTING YOUR BUILDING FROM WILDFIRE

A Guide for Business Owners and Property Managers

Commercial building wildfire risks are increasing as more small businesses are being established close to or within wildfire-prone residential developments. Medical and dental offices, small retail stores, and offices for lawyers, architects, engineers and others are commonly found in residential-style buildings with features like steep-sloped shingle roofs, gable end roofs, and even car garages. The commercial businesses operating inside these structures could require exterior commercial style accommodations including parking lots and handicap ramps.

Wildfire risk now applies to every state in the United States. While fire season was traditionally thought to start in the summer and run into the fall, that no longer applies as we are consistently seeing fires outside of this time frame. This is cause for additional vigilance when it comes to the planning and preparation of small commercial structures for this risk. The following will help reduce the vulnerability of your business to wildfire, identifying the most common exposures and providing guidance on how to prepare the building and surrounding area.

Periodic inspections should be conducted to confirm that appropriate actions have been taken to help minimize the risk of ignition. Reducing risk requires inspecting their property monthly and ongoing maintenance to prevent the accumulation of combustible material.

START WITH THE BUILDING

No one action reduces risk completely—the solution requires a proactive “systems-based” approach. Wildfire research shows this critical group of actions are essential to meaningfully reduce your building’s wildfire risk. Taken together, these steps give your business the best chance of survival.



Roof

The roof is one of your first lines of defense against wildfire embers. Embers can travel miles, landing on the roof and in open gutters, which can easily ignite combustible materials like wood shake shingles and tree debris.

Class A fire-resistant rated roof covers provide the most protection from possible ignition. The most common Class A roof covers are:

- Asphalt shingles,
- Concrete, clay, slate, or masonry tiles, which should be plugged using a noncombustible material (i.e., bird-stops) or
- Metal shingles or panels.

Vinyl gutters can melt when exposed to embers or high heat, so metal gutters are recommended. The underside of building eaves can be vulnerable to direct flame contact and should be made of noncombustible materials. Additionally, a building should not have open soffits where the bottom of the roof deck and structural members are exposed, because they can ignite and lead fire to spread to other building components.



To better understand your roof, verify:

- Roof cover is Class A fire-resistant.
- Gutters are made of metal, not vinyl.
- The underside of your building eaves are enclosed with noncombustible siding material.
- There are no open soffits where the roof deck and structures are exposed.

Inspection & Maintenance:

- Maintain roof, gutters, and downspouts by clearing tree debris, such as leaves and pine needles.

Upgrade:

- Replace current roof with a Class A fire-resistant-rated roof.
- Hire a licensed and insured contractor to replace vinyl gutters with metal ones.
- Protect gutters by incorporating a noncombustible cover device. If the roof slope allows, the device should be installed so that it is parallel to the plane of the roof slope. (This may not be possible with some steeper sloped roofs.)
- Enclose eaves with a noncombustible or ignition-resistant siding material, such as fiber-cement board or 2-inch lumber (e.g., 2x4 or 2x6; not plywood).

Vents

Windblown embers can enter a building through vents in the attic, roof, gables, and/or a crawl space and start a fire within the facility.

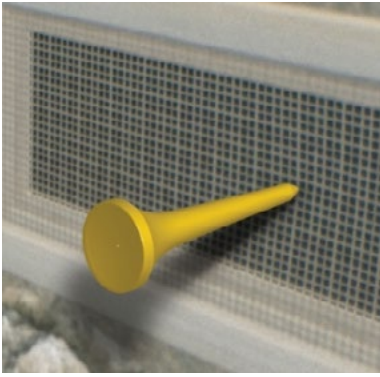
A building may have several types of vents, including roof vents, ridge and off-ridge vents, wall vents at gable ends, vents under eaves, and soffit vents. Vents that are perpendicular to the flow of wind, such as gable end wall vents, are more vulnerable to ember entry; vents that are parallel to the flow of wind, such as soffit vents or ridge vents, are less vulnerable.

Inspection & Maintenance:

- Remove debris such as leaves from any metal mesh.
- Check the mesh over all vents for damage, gaps, knicks, or holes as embers can penetrate these areas.

Upgrade:

- Replace plastic dryer vents with metal ones that have a louver or flap in lieu of metal mesh (due to design and function).
- On all other vents, install ember and fire-resistant vents or ensure they are covered with 1/8 inch or finer metal mesh.



Tips: (1) Mesh can be placed on the inside or outside of the vent. (2) You can use a golf tee to test whether the mesh is the correct size of 1/8 inch or finer. If the tee does not fit through the mesh openings, it is the correct size.

Inspection & Maintenance:

- ❑ Inspect exterior wall siding for cracks where embers can penetrate. Seal per manufacturer recommendations.
- ❑ Inspect window glazing and replace it if excessively aged, damaged, or missing.

Upgrade:

- ❑ Replace combustible siding, including wood, wood-fiber, or vinyl siding with a noncombustible material like concrete-fiber board, stucco, brick, or stone veneer.
- ❑ Remove the lowest 6 vertical inches of combustible exterior siding and replace with 6 inches of noncombustible material, such as stone veneer or brick.
- ❑ If present, replace decorative shutters with metal shutters or remove them.
- ❑ Install exterior windows, skylights, and glass openings within doors with multipaned glass with at least two tempered panes or glass blocks (windows only).

Exterior Walls, Windows, & Doors

In a wildfire event, embers accumulate against buildings at the exterior walls and other horizontal surfaces like decks or ramps and can easily ignite a building. Walls should be made of noncombustible or ignition-resistant materials. The bottom of exterior walls should have a 6-inch noncombustible vertical clearance.

When a window fails, it creates an opening large enough for fire or embers to enter the building, igniting it from the inside. Non-tempered glass is prone to breaking when exposed to wildfire conditions, and single-paned windows are vulnerable. Depending on the type of glass, a window that is exposed to flames may break after only 1-3 minutes of exposure.

IBHS's Wind-driven Building-to-Building Fire Spread experiments also found when window frames are exposed to direct flame contact and radiant heat from a nearby fire, vinyl frames often melt or deform, leading to the outer-pane of glass falling out. For this reason, choose windows that are dual-paned and tempered.

Similarly, when subjected to radiant heat exposure or direct flames, personnel doors that are not solid or are made of combustible materials can fail. This provides another large opening to a building that can allow fire inside.

To better understand your building:

- ❑ Determine if the walls and doors are made of noncombustible or ignition-resistant materials.
- ❑ Ensure there is a minimum of 6 vertical inches (measured from the ground up and from any attached horizontal surface like a ramp) of noncombustible wall material such as brick, stone, fiber-cement siding, or concrete.



- ❑ Replace vinyl-framed windows with a noncombustible metal frame such as aluminum.
- ❑ Replace exterior doors with one of the following:
 - Solid doors with a surface or cladding that is noncombustible or ignition-resistant such as: metal, solid hardwood (e.g., oak), or fiberglass.
 - Install a noncombustible storm door as the outermost exterior door.

Decks & Accessibility Ramps

Decks and accessibility ramps can act as a source of ignition for embers on top and embers and flames underneath if they are not properly designed, installed, and maintained.

Inspection & Maintenance:

Top surfaces

- ❑ Clear all debris and remove any trees or shrubs. A few small, potted plants or flowers no taller than 36" in noncombustible planters are acceptable.
- ❑ Limit items to those composed of only noncombustible or ignition-resistant materials such as cast aluminum furniture. A small number of combustible items that can be easily removed and stored when necessary (chair cushions, door mats, etc.) are acceptable.

Underneath

- ❑ Clear all debris, including leaves and trash.
- ❑ Remove any vegetation, including grass and weeds.
- ❑ Do not store anything underneath the structure.

Upgrade:

- ❑ Install hardscape such as concrete, gravel, or pavers out to 5 feet and leave noncombustible bare soil underneath the deck or ramp. Ensure the area under and around the deck or ramp is free from any vegetation, furniture, and debris.



- ❑ Enclose the area under the deck or ramp to reduce the accumulation of debris using one of the following methods:
 - Install noncombustible, corrosion-resistant 1/8 inch or finer mesh around the outer edge of the deck from the walking surface to the ground to prevent ember intrusion. If a material such as lattice is installed over the mesh, it should also be noncombustible.
 - Fully enclose with a noncombustible wall covering/cladding.
- ❑ Replace deck and ramp with posts, joists, railings, stairs, and walking surfaces with no gap, noncombustible materials such as metal or light-weight concrete.

Fences

Wooden and vinyl fences can be a source of fuel ignition and act like a wick leading fire straight to your building.

Inspection & Maintenance:

- ❑ Remove any leaves that build up along the fence.
- ❑ Verify that back-to-back fences are not installed.
- ❑ Remove rows of bushes or privacy trees.

Upgrade:

- ❑ Replace combustible fencing within 5 feet of the building, including where it attaches to the building, with noncombustible fencing material such as metal/aluminum.
- ❑ If present, work with neighboring businesses or homes to remove back-to-back fences.



Continue with Defensible Space

Defensible space refers to the area around your business that can be designed and maintained to eliminate fuels and act as a buffer to help lower the chance fire will spread to your building.



Building Ignition Zone – The First 5 Feet Around the Business

The Building Ignition Zone is one of the most critical aspects of wildfire mitigation at the parcel level and includes a noncombustible space from the edge of the exterior walls to a distance of 5 feet from the building footprint, as shown above. When decks and/or covered porches, including stairs are present, the building ignition zone should extend around them.

Inspection & Maintenance:

- Area should be free from all vegetation (trees, shrubs, bushes, plants, grass, weeds, etc.). Any overhanging limbs or branches from nearby trees and bushes should be trimmed back to be outside the 0–5-foot noncombustible building ignition zone.
- The area should be free of combustible items such as furniture, firewood, trash cans, storage, etc.
- The area should be free of any parked or stored inventory, boats, RVs, or other vehicles.
- Area should not have any combustible signage.



Upgrade:

- Install noncombustible ground cover, such as gravel, paving stones, or concrete.
- Install building identification signage. This should be provided at each vehicle access entrance and be visible from both directions of travel.
 - Signage should be made from a noncombustible material.
 - Street numbers should be at least 4 inches high and reflective, as well as applied to a contrasting background.

Landscaping in the Remainder of the Parcel

The remainder of the property beyond the 5-foot noncombustible zone to at least 30 feet should have defensible space created and regularly maintained. Defensible space separates fuels to reduce flame intensity and propagation near a business.

Inspection & Maintenance:

- Routinely remove fallen pine needles, leaves, and other debris from trees accumulated around the business.
- Care for trees with a trunk of 4 inches or greater in diameter:
 - Should be pruned to have a canopy-to-canopy distance of at least 10 feet between other trees.
 - Tree limbs and branches must be pruned to a minimum height of 6 feet off the ground.
- Care for shrubs and bushes, including trees with a trunk of less than 4 inches in diameter:
 - Should not be placed under larger trees.
 - Should have spacing between them of at least twice the height of the tallest bush or shrub. Rows of shrubs or bushes should be removed.
- Remove dead vegetation.
- Do not store combustible items—such as wooden pallets, propane tanks, and flammable liquids—in this zone.
 - Small amounts of flammable liquids that are needed onsite should be stored in fire-rated cabinets at least 30 feet away from the building.
- Create islands or groupings of small, fire-resistant vegetation in parking lots that will result in a discontinuous path, thereby making it difficult for the fire to burn directly to the building.

Upgrade:

- Make sure small structures like sheds, garbage containment, and other outbuildings are located at least 30 feet away from your main building. If they can't be moved, consider retrofitting or enclosing them with noncombustible materials. Structures within 30 feet of your main building should be maintained with a 0–5-foot building ignition zone, just as with the main building.
- If the property is gated, the gate should open inward and have an entrance at least 2 feet wider than the driveway. Any gate should be located at least 30 feet from a roadway intersection. If secured, the gate should have a key box or lock of a type approved by the local authority having jurisdiction (AHJ).
- Fire hydrants should be located within 250–500 feet of the building and should be connected to a reliable public or private water supply. If there are no fire hydrants within 500 feet, contact the fire authority having jurisdiction (FAHJ) or local water department to understand the feasibility of adding hydrants so that one can be installed.



PROTECTING YOUR BUILDING FROM WILDFIRE

It is important to remember that **protection against wildfire** requires a holistic, systems-based approach since mitigation efforts are **most effective as the sum of all action items**. All completed tasks are essential to meaningfully reduce your building's risk. Together, **proper mitigation and routine maintenance are critical** and can begin to give your small business the best chance of survival. For more information about business wildfire preparedness visit **IBHS.org**.