Eaves, Overhangs, and Soffits

FEMA

Home Builder's Guide to Construction in Wildfire Zones **Technical Fact Sheet No. 6**

Purpose

To provide guidance on the design and construction of eaves, overhangs, and soffits in wildfire zones. The guidance pertains to both new and existing buildings.

Key Issues

- Windborne embers, convective heat, and radiant heat can be trapped under overhangs and in the upper portion of exterior walls. Overhangs and walls can ignite if not constructed of noncombustible or fire-resistant materials.
- Typical construction materials for eaves, overhangs, and soffits are not fire-resistant and are therefore susceptible to ignition by embers and hot gases.
- Once an eave, overhang, or soffit has ignited, fire can spread onto the roof, into the attic, or onto and through the exterior wall.
- Soffits normally have vents as part of the attic ventilation system. Unprotected vents can allow embers and hot gases to enter the attic (see Fact Sheet #8, Vents).

Typical Design and Construction

Eaves. Eaves are located at the down-slope edge of a sloped roof and serve as the transition between the roof and fascia/wall. An eave typically has a metal edge flashing and gutter that are attached to a wood fascia trim board.

Overhangs. Overhangs are extensions of the roof beyond the exterior wall (i.e., the joists, rafters, or trusses and the decking they support cantilever past the wall). An overhang protects the upper portion of the wall that it is attached to from rainfall, and it also shades the windows under it from the sun. Overhangs can be open, in which the trusses/rafters and decking are exposed (see Figure 1), or enclosed by a soffit.

Figure 1. An open overhang. The exposed timber rafters and decking are susceptible to ignition, and embers and hot gases can enter the attic through unprotected vents.

Soffits. A soffit encloses the underside of sloped- or flat-roof overhangs. Soffits are commonly constructed from fiber-cement panels, metal panels, stucco, vinyl panels, or wood sheathing. Metal panels, untreated wood panels, and vinyl

panels are vulnerable to damage from wildfires. Metal panels conduct heat and can distort and allow passage of embers and hot gases. Untreated wood panels can ignite, and vinyl panels can melt and fall away.

Guidance for New Buildings

- Consider designing the building without overhangs (see Figure 2) to avoid the fire-related problems associated with soffits or minimize as much as possible the extent of the overhang to reduce the potential for entrapment of embers and hot gases.
- If no overhangs or short overhangs are unacceptable because of aesthetics or a desire to protect the walls from rainfall or windows from the sun, implement the following recommended measures:
  - Enclose overhangs with soffits that have a minimum 1-hour fire-resistance rating to prevent embers and hot gases from making contact with the joists, rafters or trusses, or the underside of the roof decking.
  - Use flat, horizontal soffits (see Figure 3) instead of attaching the soffits to the sloped joists, which creates sloped soffits. A flat soffit reduces the potential for entrapment of embers and hot gases.
- For the fascia, use noncombustible or fire-resistant materials (e.g., fire-retardant-treated lumber, fiber-cement board).
- For eave vents, follow the guidance in Fact Sheet #8, Vents.

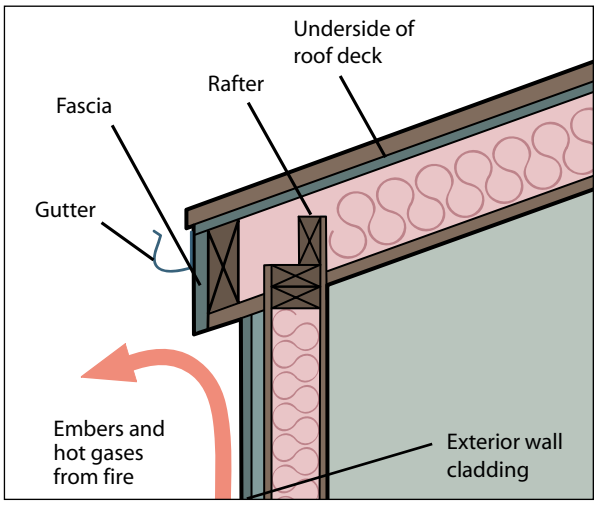

Figure 2. An eave with essentially no overhang.

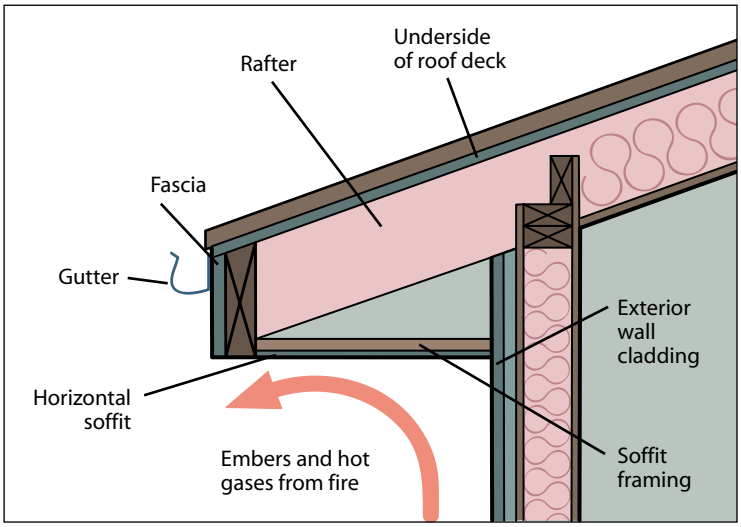

Figure 3. An enclosed overhang with a horizontal soffit.

Guidance for Existing Buildings

- Install a soffit under open overhangs according to the guidance provided above.
- Evaluate the fire-resistance of existing soffits and replace soffits that are not fire-resistant according to the guidance provided above. Some existing soffits (such as those constructed of plywood) can be covered with a noncombustible or fire-resistant material such as fiber-cement board or stucco.
- In very high Fire Severity Zones, install exterior 5/8-inch fire-resistant gypsum board between the existing and new soffit materials for enhanced fire resistance.
- If the fascia is combustible, cover the fascia board with a noncombustible or fire-resistant material (e.g., fire-retardant-treated lumber, fiber-cement board).
- For eave vents, follow the guidance in Fact Sheet #8, Vents.

Considerations

Planting combustible vegetation under eaves and overhangs should be avoided (see Fact Sheet #4, Defensible Space).

Effectiveness

All mitigation measures listed in this Fact Sheet are effective in all Fire Severity Zones.

Resources

Under Eave SFM Standard 12-7A-3, 2001 California Referenced Standard Codes (Part 12, Title 24, C.C.R.). http://www.fire.ca.gov/fire_prevention/downloads/Part_12_CA_SFM_12-7A-3_Test_Standards.pdf.