Housing in Burnable Landscapes

Presented at
“Together is Better” Workshop
California Fire Safe Council and Farmers Insurance

by

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Buildings in wildfire prone areas must be protected from:

✓ **Embers** (lofted vegetation or construction materials that are burning)

✓ Flame impingement (near-by vegetation or debris, construction material, fire wood or other woody debris)

✓ Radiant Heat (dense vegetation, an adjacent building/deck fire)
Ember Exposure
Flame impingement exposure on siding
Radiant Exposure on Siding

Western Fire Center, Kelso WA

Radiant Panel
Radiant exposure from neighbor’s house ~40 ft
There is an explicit link between management of near-home vegetation and your home surviving a wildfire. Both *building materials* and *defensible space* are necessary.
Burning [12”x 12”] ‘A Brand’ placed on roof covering. Will flame penetrate through the covering to the underside of the roof deck into the attic?

Flame penetrated through to the underside of the roof sheathing, into what would be the attic. As built, this is not a ‘Class A’ roof.
Complex roof designs

Intersection of roof-to-wall. Collection point for debris & embers.
‘edge effects’ – ember entry locations

Inspect and maintain (repair) bird stops
Debris in gutters - if ignited (by embers) the fire will expose roof edge, not your Class A roof covering.
Vents: what kind are more vulnerable to embers?
Finer mesh screens can become plugged with debris, or paint, thereby having a negative impact on the ‘moisture management’ function of vents.

- Fine mesh screen, covered over with paint
- Vent cover, manually close
- 1/8” mesh, debris build up
How about finer mesh screen?
No through-roof or ridge vents.

- Use of foam insulation.
- Thermal barrier moved from ceiling to roof line. The space below the insulation is conditioned space.
Flame spread up the wall ...

Penetration into stud cavity
Burn through at a joint in a combustible (wood) soffit. This view is from the perspective of the attic.
Performance of windows – the glass is the most vulnerable part of the window.

Frame failure

Horizontal separator on single- / double-hung window. (The horizontal separator in hung vinyl windows should be reinforced with an aluminum cross piece.)

Glass failure
Attached Decks – typical exposures

Ember exposure to top of deck

Under deck ground fire exposure
Performance related to decking

WPC, not 7A compliant

‘7A’ compliant WPC

WPC, not 7A compliant

Photo taken about 1 hour into test
Performance related to storage of combustibles
Performance related to vegetation and slope
Other components / factors ...

Garages – More ‘leaky’ to brands than anything but vents. Combustibles are commonly stored in garages.
Lattice fence-to-siding
Components
Welcome to the Fire Information Engine Toolkit!

Are you concerned about wildfire? These tools can help homeowners, community leaders, and researchers better understand where wildfires occur and how to protect homes and neighborhoods. To begin, click the drawer above that matches your needs.

Quick links:
- Homeowner Wildfire Assessment
- Evaluación de Riesgos de Incendios
- Current Fire News
- Community Wildfire Assessment
- After Fire Resources
- HiFire Fire Spread Model

Developed by the Center for Fire Research and Outreach in the College of Natural Resources at the University of California, Berkeley.

http://firecenter.berkeley.edu
### ROOFING

1. Is your roof covering something other than Class-A fire rated?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

2. Does your roof have any unshaded openings at the eave or ridge (e.g., open tiles)?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

3. Is your roof, or a portion of your roof, in poor condition?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

4. Is there vegetation or other debris in your roof valleys?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

5. Does your roof have a complex design that might allow debris, and possibly embers, to collect?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

6. Does your roof have open eaves (i.e., exposed rafter tails) with gaps greater than 1/8 inch between the blocking and rafters?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

7. Does your roof have open eaves with vent holes in the between-rafter blocking?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

8. Does your roof have boxed-in (soffited) eaves with vents in the soffit?
   - [ ] Yes
   - [ ] No
   - [ ] N/A

9. Does your roof have boxed-in eaves with combustible?
   - [ ] Yes
   - [ ] No
   - [ ] N/A
'Report Card'

Fire Information Engine
Homeowner Wildfire Assessment
REPORT CARD

Summary

Address:

This report groups your answers into high, moderate, and low categories. Answers that received a high rating are the most important to address immediately. Although answers falling into the low category may not require immediate attention, you should continually monitor these items because the results will differ as your home ages and your yard changes seasonally and annually.

This is only an estimate of the vulnerability of your home and its immediate surroundings to a wildfire event. Your structure could be at greater risk depending on other factors including its distance to wildland areas, the slope of your property, the amount of vegetative and other fuels within 100 feet of your home (even if those fuels are not on your property), and other factors too complex to list completely.

A brief possible solution to each issue is provided under each question. Click the + image to see more in-depth information.

Number of highs: 2 | Number of moderates: 11 | Number of lows: 18
http://osfm.fire.ca.gov/bml.html

Click on ‘WUI Products’

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http://osfm.fire.ca.gov/structfireengineer/pdf/bml/wuiproducts.pdf
Thanks for your attention …

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http://firecenter.berkeley.edu/quarles/squarles.htm

http://cecontracosta.ucdavis.edu/Wood_Durability