

Housing in Burnable Landscapes

Presented at

“Together is Better” Workshop

Californina Fire Safe Council and Farmers Insurance

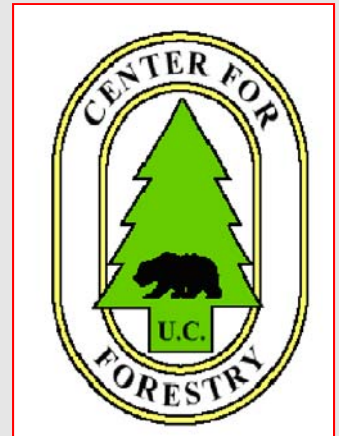
by

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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



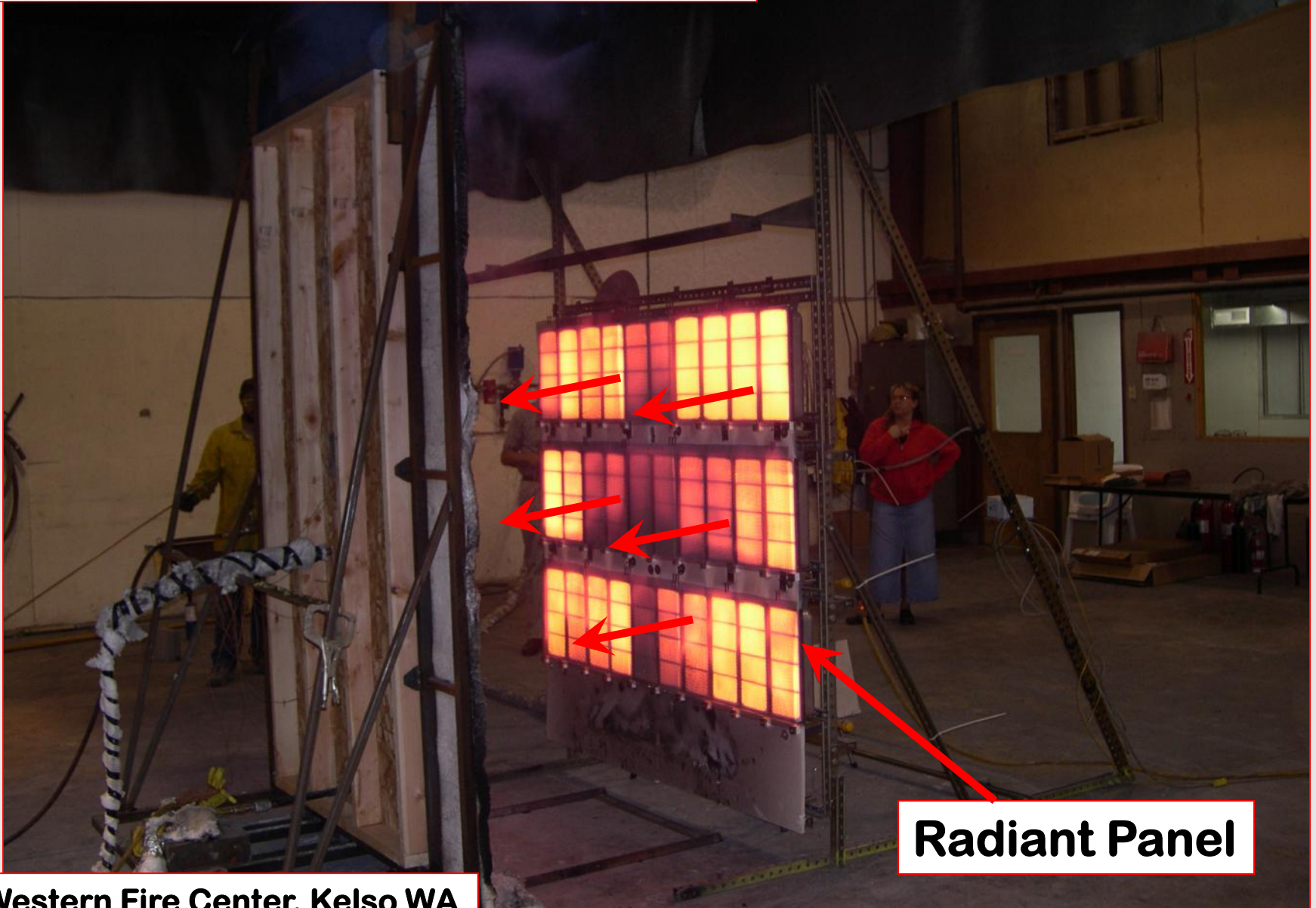


**Angora Fire,
June 2007**

Flame impingement exposure on siding

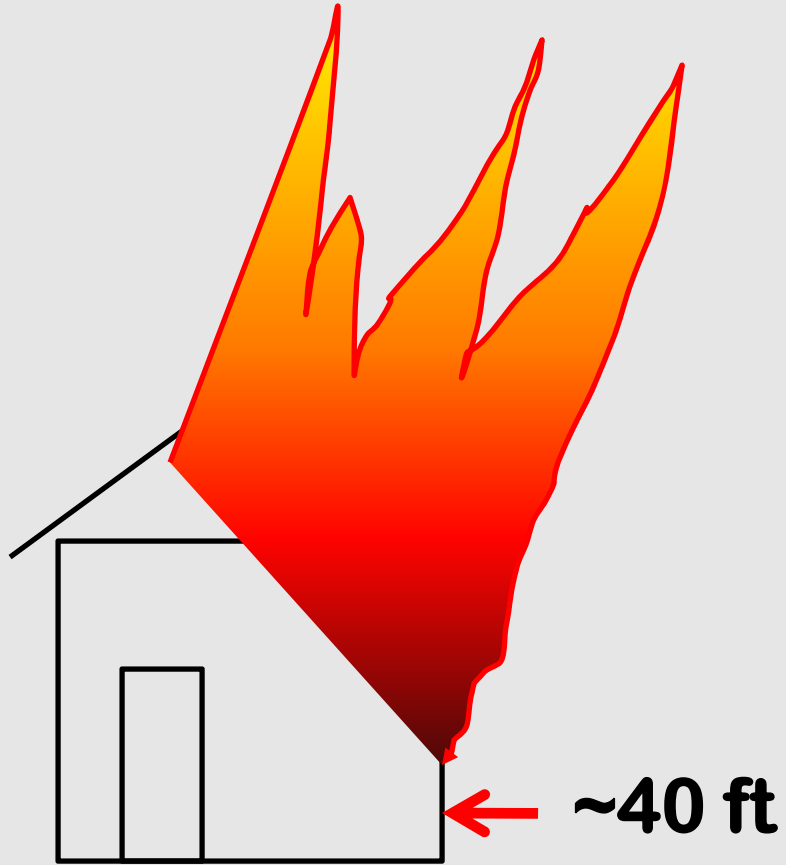


Radiant Exposure on Siding



Radiant Panel

Western Fire Center, Kelso WA



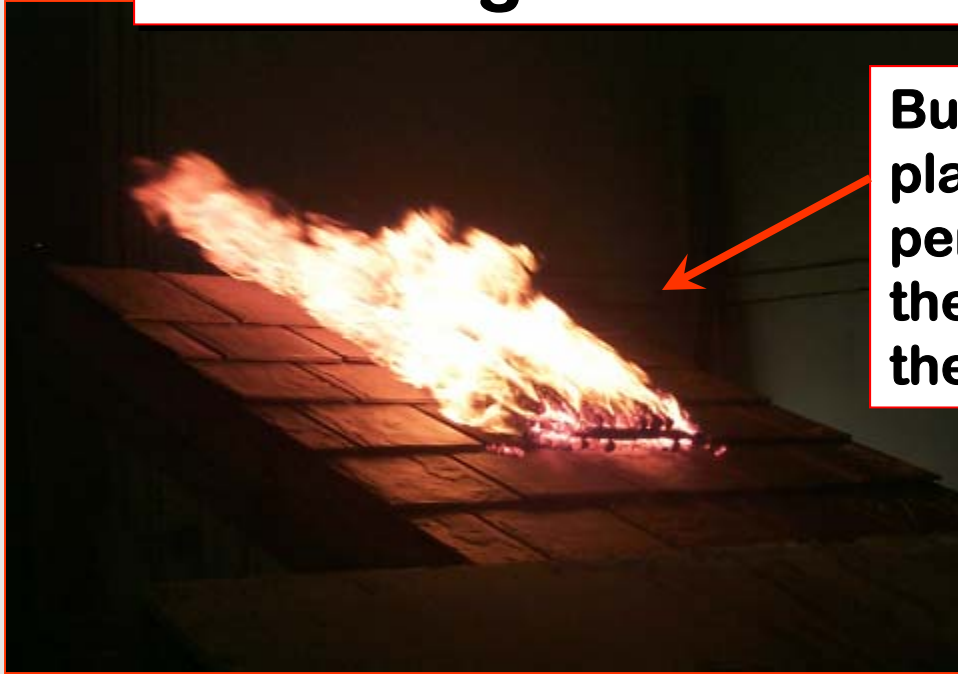
**Radiant exposure from
neighbor's house**



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.



Fire rating for roof coverings

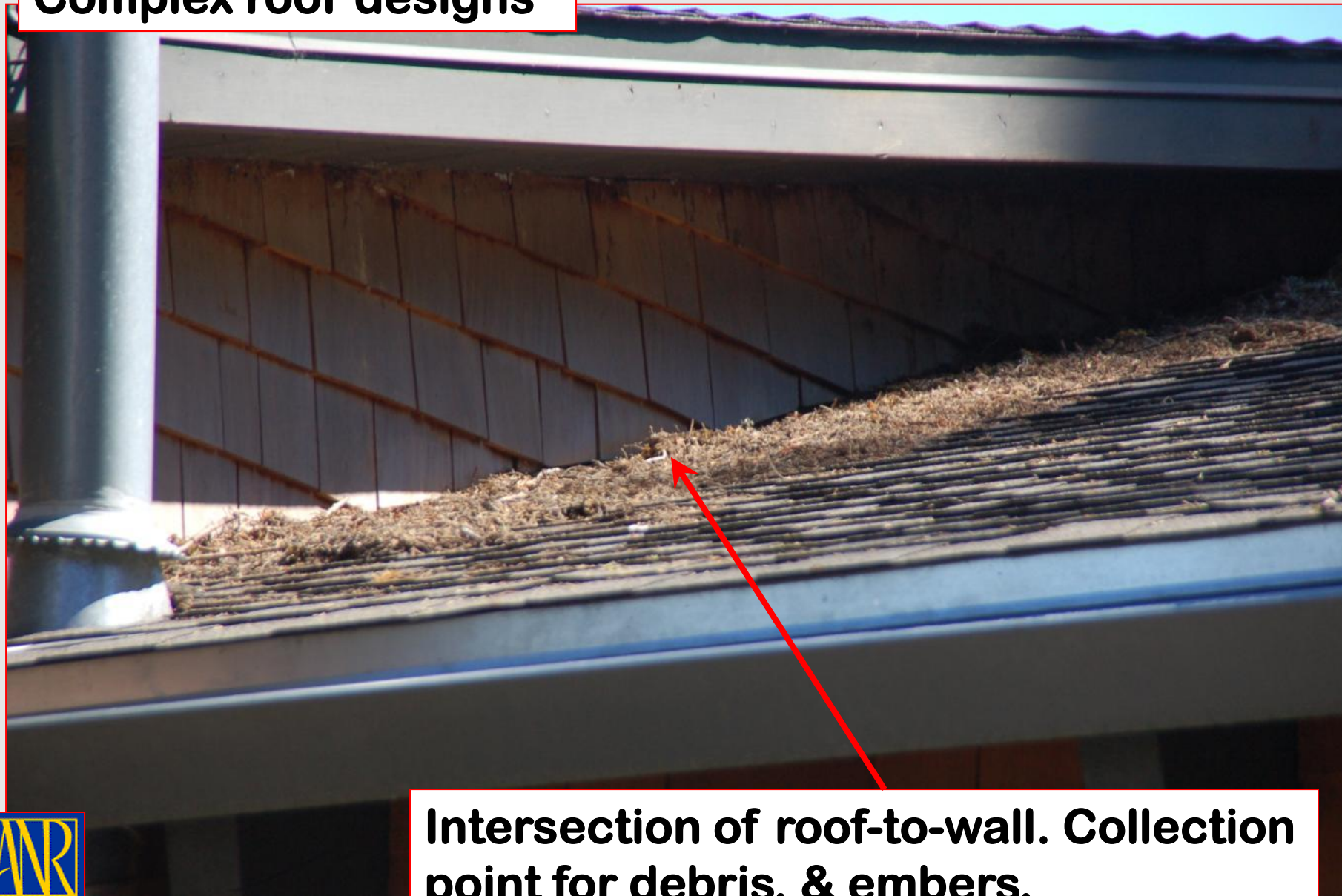


Burning [12"x 12"] 'A Brand' placed on roof covering. Will flame penetrate through the covering to the underside of the roof deck into the attic?

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.



Debris accumulation



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

A close-up photograph of a fine mesh screen, likely from a vent, which is completely covered by a thick, white, textured layer of paint. An orange arrow points from the text box to the screen.



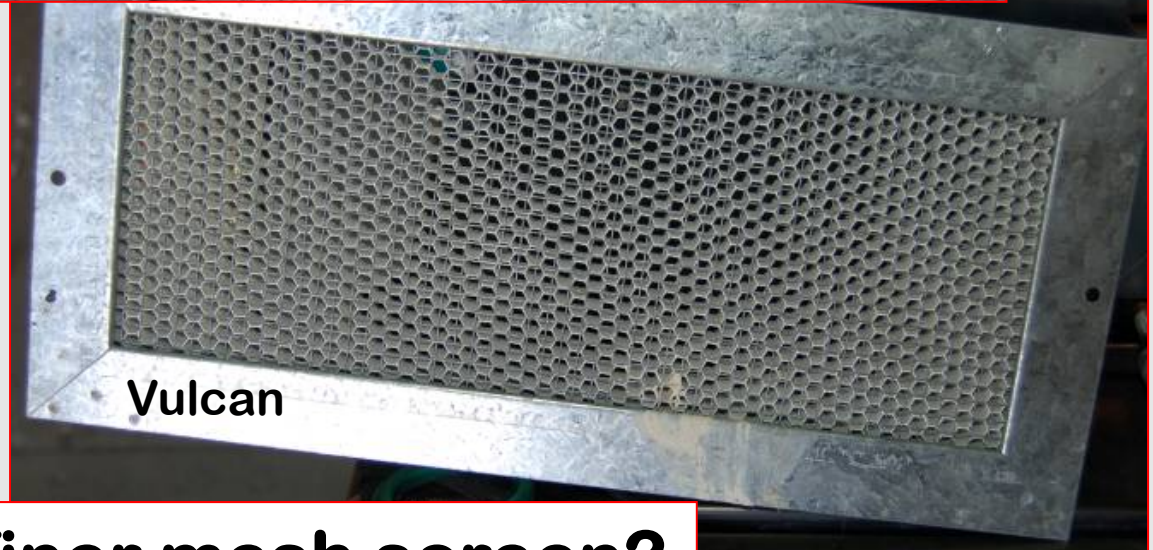
1/8" mesh, debris build up

A close-up photograph of a 1/8 inch mesh screen. The mesh is dark and heavily clogged with a thick, brown, fibrous material, likely debris or mold. An orange arrow points from the text box to the mesh.



Vent cover, manually close

A photograph showing a hand holding a white, rectangular vent cover with vertical slats. The cover is being pushed against a dark wooden wall. An orange arrow points from the text box to the vent cover.



How about finer mesh screen?

No through-roof or ridge vents.

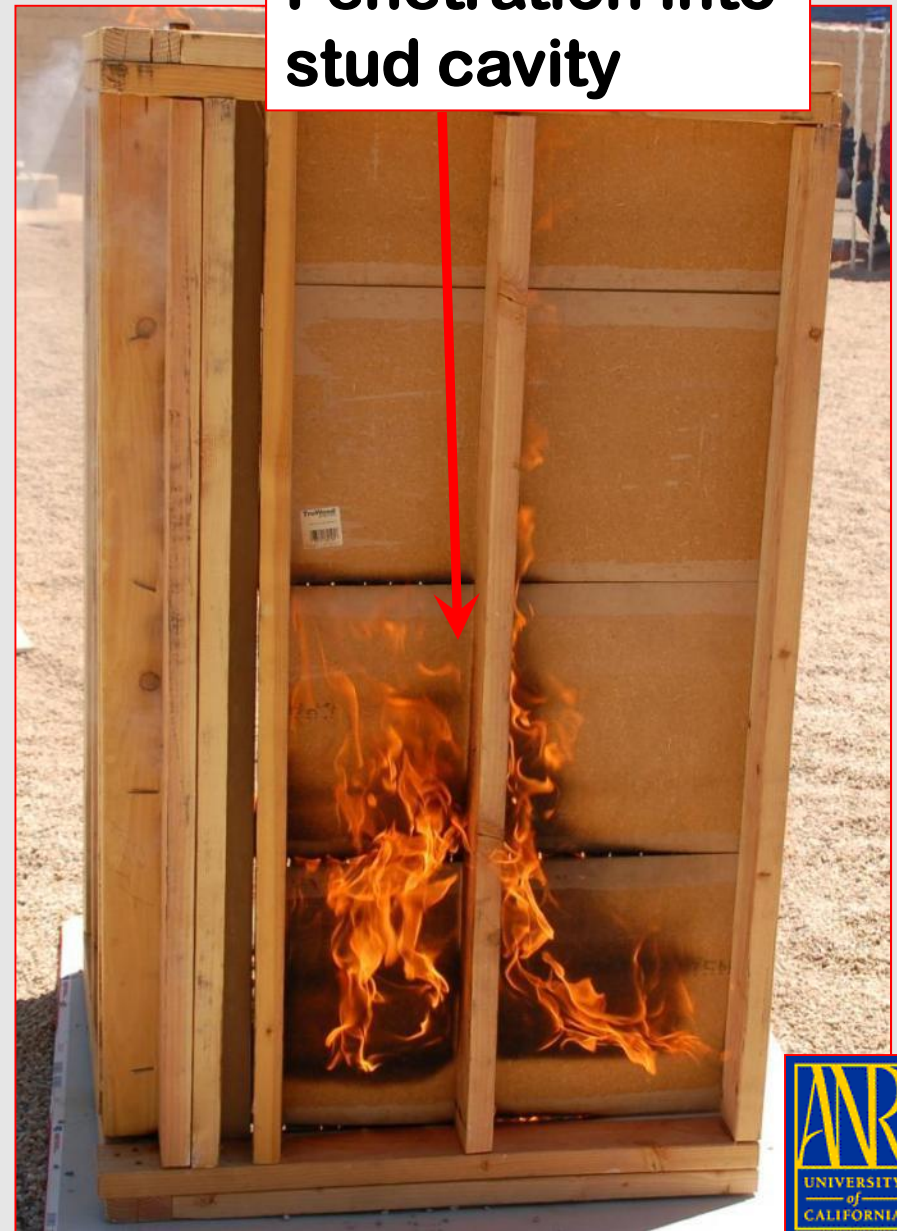


- Use of foam insulation.**
 - Thermal barrier moved from ceiling to roof line.**
- The space below the insulation is conditioned space.**



**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.



Open-eave framing



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



Window shutter

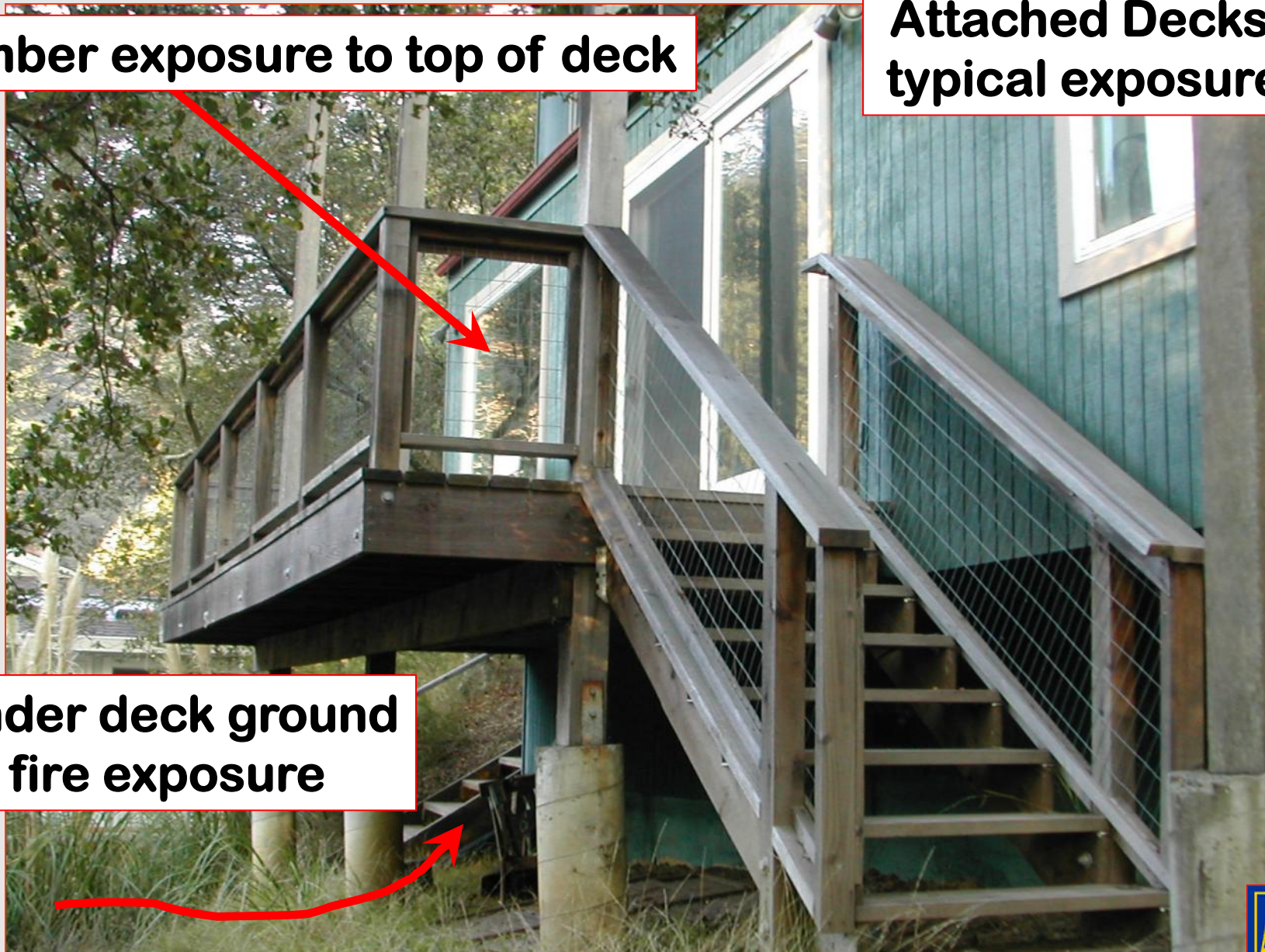




Ember exposure to top of deck

**Attached Decks –
typical exposures**

**Under deck ground
fire exposure**



Performance related to decking



‘7A’ compliant WPC

WPC, not 7A compliant

Photo taken about 1 hour into test

Performance related to storage of combustibles





Deck

**Performance related to
vegetation and slope**



**Photo courtesy Chief Craig,
Novato FPD**

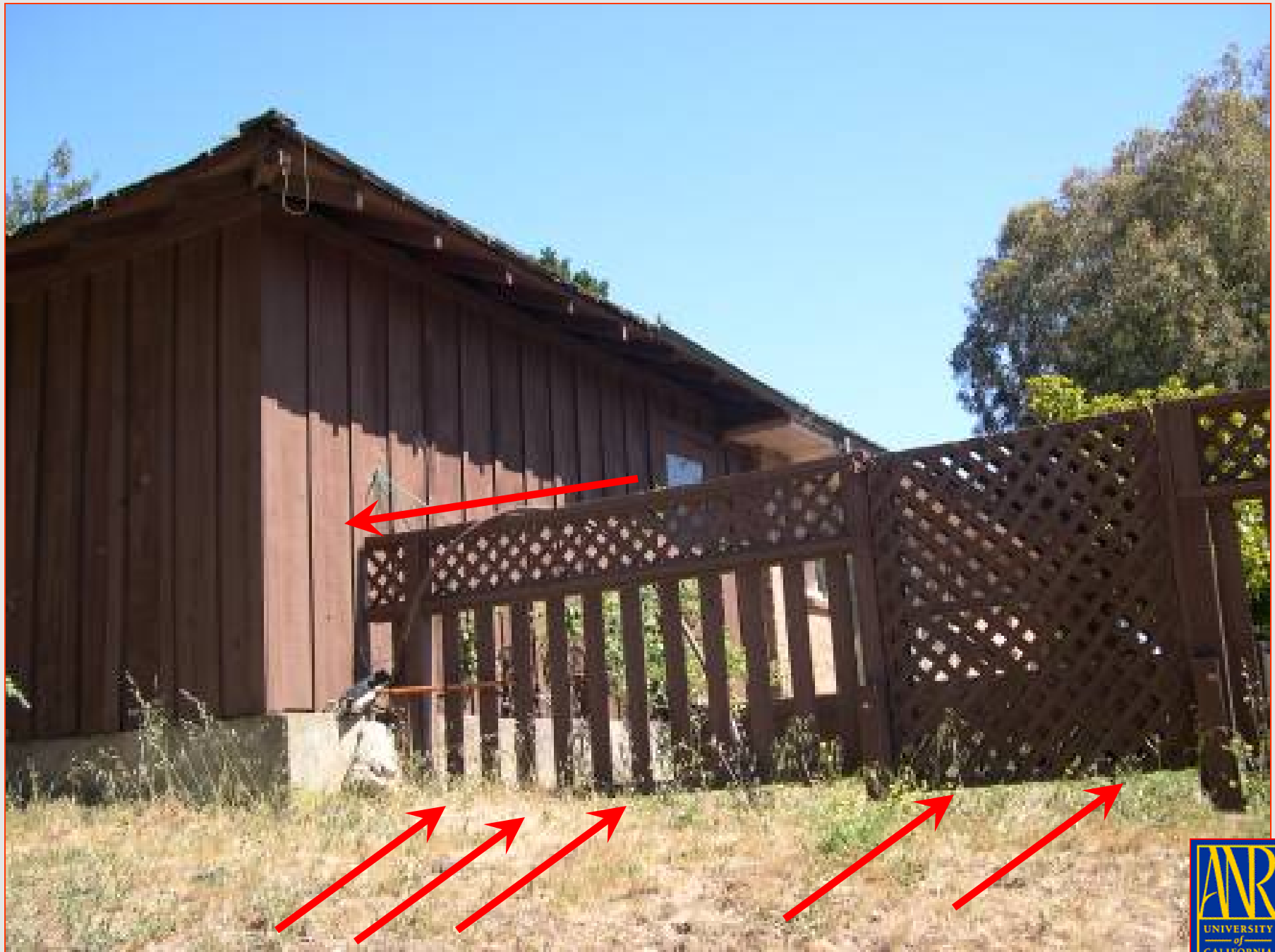
Other components / factors ...



Garages – More ‘leaky’ to brands than anything but vents. Combustibles are commonly stored in garages.



Gap and vent



Lattice fence-to-siding



'HWMG'

Homeowner's Wildfire Mitigation Guide - Home Page - Mozilla Firefox

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http://groups.ucanr.org/HWMG/

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UC Delivers ANR News Site Map

University of California Homeowner's Wildfire Mitigation Guide



Enter Search Term Here **search**

- Main Menu
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Information on this website was compiled by a number of people at University of California, Berkeley, and is based on input from fire tests, observations of wildfire damage, and input from those who are involved in firefighting. It is very important to realize that no (livable!) house is fire proof, but you can make it more fire-safe!

The website is organized to give you an opportunity to make changes to your home and the surroundings to reduce the possibility of damage from wildfires. Some of the changes can be done very quickly and relatively inexpensively. Others may require more effort, expense, and, in some cases, professional help.

The main part of the website begins with a list of features or parts that are of concern. If you click on any of these parts, you will go through a series of visual and text information on the specific item (say the roof or siding) that includes a definition of the **possible problems** and a discussion of **potential solutions**.



<http://groups.ucanr.org/HWMG/>



Components

Homeowner's Wildfire Mitigation Guide - Components - Mozilla Firefox

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http://groups.ucanr.org/HWMG/programs.htm

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Appendixes

 **Decks**
By decks, we are including all types of horizontal walkways, including landings, porches, and patios that are directly connected or very close to a house. Decks are described by the surface that you walk on (called the deck covering).

 **Fences**
Fences (and walls) are both decorative and functional (for security and privacy) and come in many materials and configurations. While we have no laboratory fire test data on fences, there are a number of observations that indicate fences--like plants--are a much greater hazard close to a house.

 **Garages**
When houses are surveyed for wildfire vulnerabilities, quite often the garage is not considered even though it could be the most hazardous aspect of the house.

http://groups.ucanr.org/HWMG

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FIET

Fire Information Engine Toolkit - Mozilla Firefox

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http://firecenter.berkeley.edu/toolkit/

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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.

FIRE INFORMATION ENGINE TOOLKIT

HOMEOWNERS RESEARCHERS

COMMUNITY LEADERS

Quick links:

- ◆ Homeowner Wildfire Assessment
- ◆ Evaluación de Riesgos de Incendios
- ◆ Current Fire News
- ◆ Community Wildfire Assessment
- ◆ After Fire Resources
- ◆ HFire Fire Spread Model

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

 Center for Fire Research & Outreach
College of Natural Resources
University of California, Berkeley

Done

start Microsoft Power

<http://firecenter.berkeley.edu>

8:22 AM

Assessment Form

Fire Information Engine: Homeowner Fire Hazard Assessment - Mozilla Firefox

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http://firecenter.berkeley.edu/homeassessment/

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web version | printer-friendly version

Fire Information Engine

Homeowner Wildfire Assessment



For explanatory information on specific questions, roll your mouse pointer over the question. You can also click here to see the glossary, which contains definitions for specific terms. Click here for Frequently Asked Questions.

ROOFING

1. Is your roof covering something other than Class-A fire rated? ☐ yes ☐ no ☐ n/a
2. Does your roof have any unstopped openings at the edge 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

Done

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'Report Card'

Fire Information Engine: Homeowner Fire Hazard Assessment - Mozilla Firefox

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http://firecenter.berkeley.edu/homeassessment/report_card.pl?template=undefined

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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

HIGH

Done

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CALIFORNIA DEPARTMENT of FORESTRY
and FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL

<http://osfm.fire.ca.gov/bml.html>

Click on 'WUI Products'



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Version (April 3, 2009)

Published by **CAL-FIRE**
FIRE ENGINEERING DIVISION
BUILDING MATERIALS LISTING PROGRAM

Revised 04/03/09

<http://osfm.fire.ca.gov/strucfireengineer/pdf/bml/wuiproducs.pdf>

Thanks for your attention ...

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(510) 665-3580

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

http://cecontracosta.ucdavis.edu/Wood_Durability

