LIVING WITH WILDFIRE

Home Ignition Zone Assessment
Reducing Risk of the House
DATE, 2010

Focus on the Home Ignition Zone

- Create sustainable, fire-wise environments for our homes by starting from the house out rather than from the wildland in
  - Building materials and design
  - Homesite materials and maintenance
  - Personal responsibility
  - Community cooperation

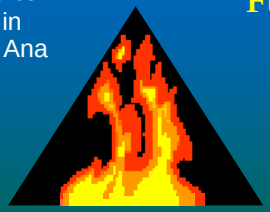
Living with Wildfire Home Ignition Zone Assessment

INSERT Date of Class, 2010

- Introductions
  - RB United and instructors
- Reducing Risks of the House
  - Overview by NAME
  - Walk around the house with checklist
- Reducing Risks of the Homesite
  - Overview by NAME
  - Walk around the homesite with checklist
- Applying the Checklist
  - Walk around second house with checklist
  - Closeout and next steps

Fire Basics: The Fire Triangle

Oxygen: fires burn aggressively in strong Santa Ana winds



Fuel: vegetation, wood decks, houses, gazebos, etc.

Heat: fuels can ignite from embers, heat or flames

By Anne Fege, David Bacon, and Kay Stewart
For RB United (Rancho Bernardo)
Contact Anne Fege afege@aol.com

Embers

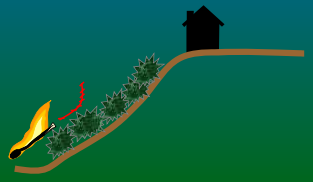
- The transfer of heat through objects in direct physical contact (conduction)
  - Smoldering pieces of fuel carried by winds that can travel well ahead of fire front and ignite homes and vegetation far from the main fire
  - Ember attack is the main cause of structure losses and damages (80%)
  - Example: embers falling on wood roof, landing on horizontal surfaces, or entering into vents

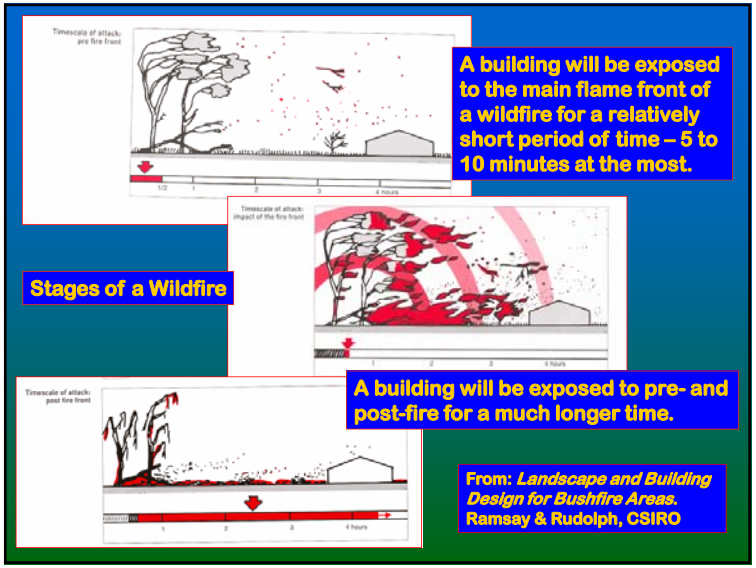
Heat

- Transfer of heat through rays (radiation)
  - Vegetation (ignited by embers!) burning next to combustible materials
  - Examples: woodpile burning next to house, neighbor's house burning…..

Flame

- The transfer of heat through gases or liquid (convection)
  - Flame length depends on burning material (chaparral, trees, shake roofs, houses)
  - Typically southern California wildland flames concentrate two to five minutes in one place, not hot or long enough to ignite structures





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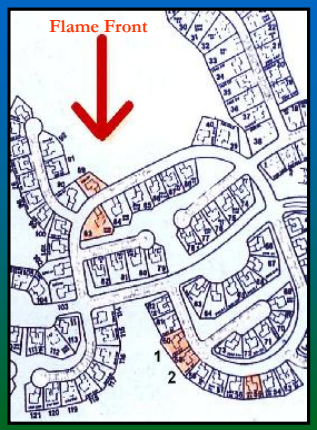
How do houses ignite?

- Houses marked in orange burned down
- Based on the concept of defensible space, houses 1 and 2 should not have burned down because they were 300 feet from the actual fire
- Embers ignited the roof of one house which in turn ignited its neighbor



How do houses ignite?

- Most damage caused by wind-blown embers
- In the Witch Fire area, 13% of houses burned
  - Only 2% of houses burned were built after 2004
- More than 12,000 structures saved within ¼ mile of fire perimeter
  - Defensible space and landscaping
  - Fire-resistive building materials and methods
  - Personal responsibility to do this!

Homeowner's Assessment Checklist

- Center for Fire Research and Outreach
  - University of California at Berkeley
  - Steve Quarles, Wood Performance and Durability Specialist
  - http://firecenter.berkeley.edu/toolkit/homeowners.html

How do houses ignite?

- Roofs and roof coverings can cause houses to ignite if:
  - Embers land on combustible roof covering
  - Embers burn through roof covering
  - Embers blow under roof tiles
  - Heat of burning house next door ignites roof

Scripps Ranch 2003

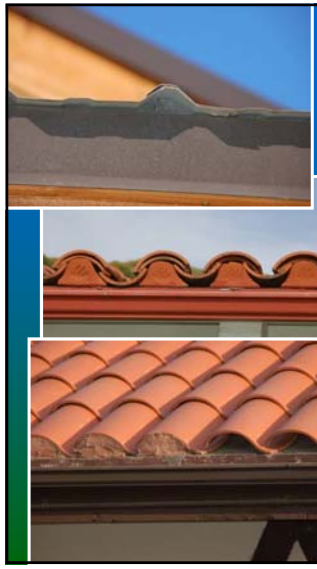
By Anne Fege, David Bacon, and Kay Stewart
For RB United (Rancho Bernardo)
Contact Anne Fege afege@aol.com

Is the roof covering something other than Class “A” fire rated? R1

- Fiberglass asphalt composition and tile roofs have Class “A” ratings
- Other roof assembly ratings depend on materials between roof covers and plywood (assembly)
- Treated wood shake shingles and proper assembly can meet Class “A” tests…

Does the roof have any unstopped openings at the edge or ridge (e.g., open tiles)? (R2)

- Roofing alone will not save the structure
- Roof edge protection systems are designed to resist ember penetration



Roof Edges

- ***704A.1.2 ‘Where roof profile allows for a space between roof covering and deck, the spaces shall … prevent the intrusion of flames and embers.’***
- Tile and metal roofs need edge protection, like bird stops or cement mud

Is the roof in poor condition (e.g., broken pieces, open areas, badly curled shingles)? (R3)

- Repair and replace broken tiles and composite shingles

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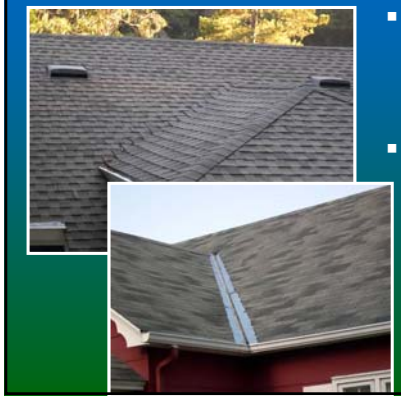
Is there vegetative fine fuels, or other combustible debris in the roof valleys? Does the roof have a "complex design"? (R4, R5)



- With interwoven asphalt composite shingles, no additional protection is required at the valley
- Underlying cap sheet required for other roof assemblies

How do houses ignite?

- Vents are essential for moisture management
- Houses ignite if:
  - Embers enter structure through vents
  - Flames enter structure

Scripps Ranch 2003

Does the roof have open eaves (i.e., exposed rafter tails) or vents? (R6)

- Do gaps greater than 1/8" exist between the blocking and rafters? (R6a)
- Are there vent holes between rafters? (R6b)
- Are there unscreened vents or screened vents with a mesh size >1/4" (e.g., crawl space)? (S7)

Vents

- ***704A.3.2.1 Exterior Wall Vents. Vent openings in exterior walls shall resist the intrusion of flame and embers into the Structure or vents shall be screened with a corrosion-resistant, non-combustible wire mesh with ¼ inch (6 mm) openings or its equivalent.***

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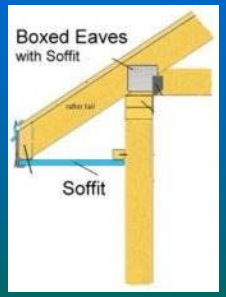
Roof Vents

Attic ventilation

New Vent Designs

- Vents have a baffled design that blocks embers
- Still allow sufficient air flow to remove excess moisture and (where necessary) reduce heat load in attic
- More vents may be needed to maintain air flow function

Does the roof have boxed-in (soffited) eaves? (R7)



- Is there a vent in the soffit? (R7a)
- Is the soffit material combustible? (R7b)
- Seal cracks to attic
- Remove combustible materials on the ground
- High cost retrofit for property risk reduction

Is the chimney opening unscreened? (R8)

- Spark arresters with a ½" screening are required
- Keep screens maintained!
- Spark arresters prevent fireplace embers from igniting exterior landscape and roofing
- Also required for outdoor fireplaces

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Is there debris in the roof gutters? (R9)

- Check and clean out gutters every June
- Install gutter screens where debris builds up
- Or rent a son-in-law to get on the ladder and clean out the gutters!

How do houses ignite?

- Windows, doors, siding, and garages can cause houses to ignite if:
  - Embers enter house through unsealed (or open) windows, exterior and garage doors
  - Heat breaks windows
  - Heat from burning vegetation or woodpile ignites siding
  - Embers enter cracks in siding

Does the home have single pane windows? (W1)

- Outer pane broken, inner intact (dual-pane annealed)
- Install dual pane windows, one pane must be tempered glass
- Tempered glass in doors and skylights

Is the window or window frame in poor condition (e.g., window can't be closed, frame is warped)? (W2)

- Thermal failure of window trim without loss of the double pane windows
- Failure of vinyl window frames

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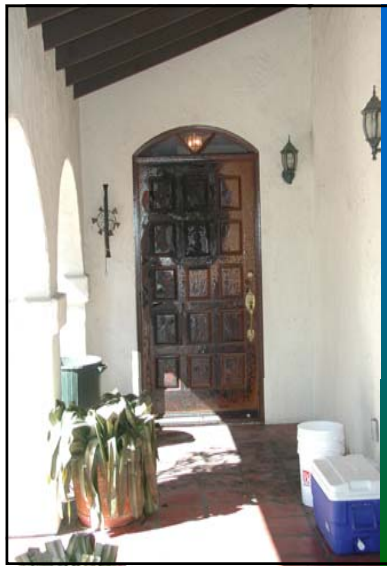

Doors and Assembly

- Doors do burn!
  - (Gavilan Fire, February 10, 2002)
- Door ignites and burns through, then interior ignites
- Embers enter house through unsealed doors

Is the siding combustible (untreated wood, vinyl, or wood or wood-plastic composite material)? (S1)

Are there any other gaps (openings) located in the building envelope? (S2)

Is the trim combustible? (S3)

- Repair cracked and missing siding
- Paint/stain and maintain wood siding and trim
- Fill holes around light fixtures



Is there an attached garage or one close (within 30') to the home? **(**G1)

What's stored behind the door?

- Boxes
- Papers
- Oil and paint
- Other ignitable materials?

Does the garage have a vehicle access door? (G2)

Are there any gaps under or around garage doors? (G3)

- Gaps in assembly
- Identify where can embers enter
- Weatherstrip around doors and garage

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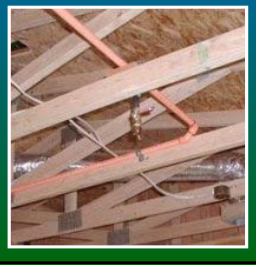
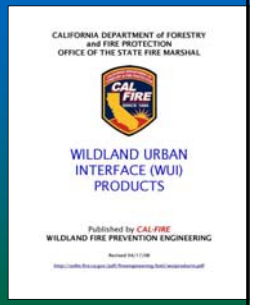


Question: Should I install sprinklers?

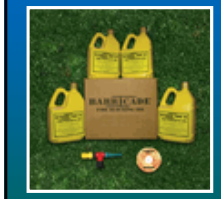
- Designed as a "life safety" system for residential fires
- Will slow or even stop the spread of fire if embers enter the living spaces of your home
- Some areas require in new construction

Question: Where do I get information on materials?

- International Code Council Evaluation Service, Inc. (ICC-ES)
  - Technical evaluations of building products, components, methods, and materials
  - Division 06—wood and plastics
  - Division 07—thermal and moisture protection (foams, gels, etc.)
  - www.icc-es.org
- Office of State Fire Marshal "approved" products http://osfm.fire.ca.gov/strucfireengineer/pdf/bml/wuiproducts.pdf



Question: Should I buy foams or gels?



- Use products tested by International Code Council (ICC-ES)
- You or your service provider must apply it during wildfire event… will you be home, or can the provider get to your house?

Living with Wildfire: Home Ignition Zone Assessment

- Walk around the house with the checklist!
- Start at the top—roof and vents
- Windows and walls (siding)
- Doors and openings

Remember! Create sustainable, fire-safe environments for our homes by starting from the house out rather than from the wildland in.

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