Wildfire Ignition Resistant Home Design (WIRHD) Program

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WIRHD Program Overview

- Sponsor:
  - Department of Homeland Security, Science and Technology Directorate, Infrastructure Protection & Disaster Management Division.

- Why sponsored:
  - DHS focus on protecting the homeland and communities.
  - Prepare and protect instead of respond and recover.
  - Help put mitigation into homeowner’s hands.

October 2007 Southern CA Wildfires, Schuler
Severe Fire Conditions

Wildland Fire

Urban Fire

Fire Protection Resources

Decision to Protect

Homes Destroyed

*Homes that don’t ignite, don’t burn. Learn how to protect your home against ignition with the new WildFIRE Wizard software tool.
WIRHD Program Partners

WIRHD Program

Stakeholders

Peer Review Panel
CREATE YOUR PLAN VIEW

Click the add block button to begin building your house. Your selection will appear at the top left of the grid. Once the block is on the grid, click and drag to position. Use multiple blocks to make the shape of your house.

To resize the block, click and drag the corners.

To add multiple stories right-click the block.

To delete the block or feature, right-click on it and select.

Click next to continue.

Add Block
WildFIRE Wizard Example (continued)

ADD ROOF FEATURES

Step One:
Select the roof shape by right-clicking on each house block.

Step Two:
Select your additional roof features by using the icons.

Roof Covering Type

- ASPHALT SHINGLES
- WOOD SHINGLES
- METAL ROOF
- TILE

Roof Features

- DORMER
- CHIMNEY
- SKYLIGHT
- VENT
ADD WALL FEATURES, FRONT SIDE

Select your wall features by using the icons below.

Doors
- Exterior Door Metal
- Exterior Door Glass
- Exterior Door Wood
- Single Garage Door Metal
- Double Garage Door Metal

Windows
- Single Pane Window
- Dual Pane Metal
- Dual Pane Vinyl
- Dual Pane Wood
ADD WALL FEATURES, RIGHT SIDE

Select your wall features by using the icons below.

**Doors**
- Exterior Door Metal
- Exterior Door Glass
- Exterior Door Wood
- Single Garage Door Metal
- Double Garage Door Metal

**Windows**
- Single Pane Window
- Dual Pane Metal
- Dual Pane Vinyl
- Dual Pane Wood
ADD WALL FEATURES, BACK SIDE

Select your wall features by using the icons below.

Doors
- Exterior Door Metal
- Exterior Door Glass
- Exterior Door Wood
- Single Garage Door Metal
- Double Garage Door Metal

Windows
- Single Pane Window
- Dual Pane Metal
- Dual Pane Vinyl
- Dual Pane Wood
ADD WALL FEATURES, LEFT SIDE

Select your wall features by using the icons below.

**Doors**
- Exterior Door Metal
- Exterior Door Glass
- Exterior Door Wood
- Single Garage Door Metal
- Double Garage Door Metal

**Windows**
- Single Pane Window
- Dual Pane Metal
- Dual Pane Vinyl
- Dual Pane Wood
ADD FEATURES OF THE HOME IGNITION ZONE

Select all features of the areas surrounding your home (Home Ignition Zone - HIZ), including neighboring areas. You may resize some of the features by dragging the bottom-right hand corner of the icon.

All areas of the Home Ignition Zone without structures, landscaping materials, or added vegetation are green grass.

Landscape Materials

- Dry Grass
- Pine Straw
- Mulch: Synthetic
- Mulch: Fine Fuel
- Mulch: Large Fuel
- Stone Bed

Structures
If a wildfire was to endanger your neighborhood, the primary source of the wildfire [within a 1/3 mile of your home] would occur from which of the following?

- A) A large forest, such as a national park
- B) A grassland or field
- C) An overgrown area made up of shrubs, small trees, coarse undergrowth, etc.
- D) My neighbors homes/other buildings would be the largest source
- E) There is no major source within 1/3 mile of my home

If A-D was chosen above, how far from your home is the primary source?

- A) 10 feet or less
- B) 100 feet or less
- C) 200 feet or less
- D) 1/3 mile or less

Lastly, within the primary source area, how densely populated is the source?

- A) Thick forest/shrubs/grassland
- B) Thin forest/shrubs/grassland or neighboring homes within 60 ft.
- C) Clumps of trees/shrubs/grassland or neighboring homes 60-200 ft apart
- D) Individual trees, shrubs or homes greater than 200 ft apart
CREATING YOUR CUSTOMIZED REPORT

Please be patient - this could take up to 5 minutes.
RESULTS & RECOMMENDATIONS

Planning, proper placement and type of vegetation along with the use of wildfire resistant building materials can greatly reduce your wildfire risks. The following recommendations will provide you information about the features of your home that are most likely to ignite or catch fire. The flame symbol indicates that the feature is a vulnerability and special attention should be paid to the corresponding mitigation message. You can protect yourself and your home by implementing the following recommendations.

**Shed - Metal**

Sheds, gazebos and other outbuildings made of fire resistant materials must be hardened from ignition by blocking all openings (doors, windows, vents, etc.) that would allow embers to enter and ignite materials inside the structure.

- **FEMA**
- **FIREWISE**
- **FLASH**

**Fence**

Fences attached to the home are considered an extension of the structure. Combustible fences attached to a house can lead a fire directly to your home.

A combustible fence should be replaced or a section of the fence, or other flammable attachment, which connects to the structure should be made from non-combustible materials (metal, stucco, stone, etc.).

- **FEMA**
- **FIREWISE**
- **FLASH**

**COST ANALYSIS**

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Description</th>
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<tbody>
<tr>
<td>Free-$</td>
<td>Less than $500</td>
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<tr>
<td>$</td>
<td>$501 - $1,000</td>
</tr>
<tr>
<td>$$$</td>
<td>$1,001 - $5,000</td>
</tr>
<tr>
<td>$$$$</td>
<td>Greater than $5,000</td>
</tr>
</tbody>
</table>

Cost Information based on ISFH, Mega Fire: The Case for Mitigation

**LANDSCAPE**

**FRONT SIDE**

**Mona's House**
**Medium tree**

Medium trees near homes can be fire hazards. Deciduous trees, that drop their leaves, do not ignite easily but deposit flammable litter on or near your home. Evergreen type trees and others containing volatile resins are usually highly flammable. Flammable trees should be at least 30 ft. from structures or made ignition resistant by pruning lower branches, removing debris and litter around their bases, and separating them from other flammable trees and vegetation.

To reduce the risk of trees igniting, remove ladder fuels (limbs or branches within six (6) feet of the ground) and flammable vegetation underneath and surrounding trees that would allow flames burn under the tree and up its branches.

**Small tree**

Small trees near homes can be fire hazards. Deciduous trees, that drop their leaves, do not ignite easily but deposit flammable litter near your home. Evergreen type trees and others containing volatile resins are usually highly flammable. Flammable trees should be at least 30 ft. from structures or made ignition resistant by pruning lower branches, removing debris and litter around their bases, and separating them from other flammable trees and vegetation.

Consider replacing highly flammable trees with a more ignition resistant species.

**Medium shrub**

Flammable shrubs are a high fire hazard when located next to your home. Maintain shrubs and vegetation around your home to be ignition resistant by removing dead leaves and debris on and around the vegetation or replace flammable shrubs within 30 feet of your home with ignition resistant vegetation.
Large Tree

Large trees near homes can be fire hazards. Deciduous trees, that drop their leaves, do not ignite easily but deposit flammable litter on or near your home. Evergreen type trees and others containing volatile resins are usually highly flammable. Flammable trees should be at least 30 ft. from structures or made ignition resistant by pruning lower branches, removing debris and litter around their bases, and separating them from other flammable trees and vegetation.

To reduce the risk of trees igniting, remove ladder fuels (limbs or branches within six (6) feet of the ground) and flammable vegetation underneath and surrounding trees that would allow flames burn under the tree and up its branches.

Neighboring Home - Medium

Neighboring homes or other structures near your home can increase your fire hazard. When a neighboring structure burns it provides a concentration of heat and embers that lasts much longer than vegetation burning in the same area.

It is important that residents within 100 feet from each other maintain their homes to resist ignition from flames and embers. Fuels surrounding homes in close proximity must be treated to reduce the potential for flames to reach them or flying embers to ignite them. Awareness and understanding that leads to community action is a key to success.

Hip Style Roof

The roof is a vulnerable part of the home during a wildfire because of its ability to gather combustible litter and collect wildfire embers. The likelihood that a home will survive a wildfire is greatly influenced by the lack of debris and litter on the roof, and the ability of the roof to resist ignition from windblown embers.

The more complex the roof style (盐城s, dormes...
Asphalt Shingles

Glowing embers can be blown and deposited miles from a fire. These embers can ignite combustible roof litter or enter a structure’s openings which can lead to the ignition of a home.

Block openings to interior attic spaces with noncombustible screening or approved fire stops to prevent embers from entering and igniting interior spaces.

Clear leaves and other debris from roof surfaces, gaps and cavities during seasonal fire conditions.

Chimney

To prevent fireplace/stove embers from igniting roof coverings and debris, chimney and stove exhausts should have a spark arrester constructed of metal mesh. Chimney spark arresters usually require openings be not more than 5/8 inch diagonal and 1/2 inch square.

Metal Roof Gutters

Metal gutters are noncombustible but provide an area for flammable debris and embers to collect, which will ignite and burn allowing flames to contact surfaces and potentially catch a home on fire.

Gutters should be maintained and cleared of all combustible debris before and during seasonal fire conditions to prevent ignition by windblown embers. Consider installing a gutter cover device or use non-combustible screening to help keep flammable debris from collecting in gutters.
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Ember Exposure Probability

Ember Receptivity: Very Low
Ember Exposure: Very High
Overall Ember Danger: Very Low

Your roof is very resistant to fire, so the ember reception probability is reduced accordingly.
Use the links at left to see fire testing videos for more information on the ember threat.

The latest wildfire research and investigations demonstrate that homes can be designed and maintained to survive even the most severe wildfire. Homeowners should know that large flames aren't always the cause of your home igniting. Many homes are lost from small embers and low intensity surface fires that ignite your vegetation, home or structure. By following these recommendations you will find that by taking even small steps you can greatly reduce your wildfire risk.

For additional information:
Watch: The Tale of Two Homes-Wildfire, Wildfire How-to Animation, SRNL Ember Testing
Visit: Firewise, Ready Set Go, Flash, IIHHS, FEMA