



WDS STRUCTURAL LOSS PREVENTION DETAIL

1. Structural Loss Prevention (“Saves”)

- 1.1. The Wildfire Defense Program is designed to affect structural loss prevention of insured, enrolled policyholders through the implementation of risk management procedures (presuppression and mop-up strategies) which result in reduced frequency and severity of potential losses.

Wildfire causes damage or destruction to homes primarily through the physical processes of conduction or radiation. The purpose of performing presuppression and mop-up strategies are to effectively mitigate the routes by which wildfire damages structures.

DEFINITION: Structures that are threatened by fire as determined by the WDS Duty Officer, **and** receive presuppression and/or mop-up services **and** survive a wildfire incident are considered measurable loss preventions (“saves”).

- 1.2. **Description of Wildfire Threats to a home.** *“WILDFIRES SPREAD BY A COMBINATION OF A MOVING FIRE FRONT AND AIRBORNE BURNING AND GLOWING EMBERS. BUILDING LOSS DURING WILDFIRES OCCURS AS A RESULT OF SOME PART OF THE BUILDING IGNITING FROM ONE OR MORE OF THREE BASIC WILDFIRE EXPOSURES, WHICH INCLUDE 1) EMBERS (ALSO CALLED FIREBRANDS), 2) RADIANT HEAT AND 3) DIRECT FLAME CONTACT. EMBERS ARE LIGHT ENOUGH TO BE BLOWN THROUGH THE AIR, AND CAN RESULT IN THE RAPID SPREAD OF WILDFIRE BY SPOTTING (IN WHICH EMBERS ARE BLOWN AHEAD OF THE MAIN FIRE, STARTING OTHER FIRES). SHOULD THESE EMBERS LAND ON OR NEAR YOUR HOUSE, THEY COULD JUST AS EASILY IGNITE NEARBY VEGETATION OR ACCUMULATED DEBRIS OR ENTER THE HOME OR ATTIC THROUGH OPENINGS OR VENTS, IGNITING FURNISHING OR COMBUSTIBLE DEBRIS IN THOSE LOCATIONS. NEAR-HOME IGNITIONS WILL SUBJECT SOME PORTION OF YOUR HOUSE TO EITHER A DIRECT FLAME CONTACT EXPOSURE, WHERE FLAME CAN TOUCH YOUR HOME, OR A RADIANT HEAT EXPOSURE. IF THE FIRE IS CLOSE ENOUGH TO A COMBUSTIBLE MATERIAL, OR THE RADIANT HEAT IS HIGH ENOUGH, AN IGNITION WILL RESULT. EVEN IF THE RADIANT EXPOSURE IS NOT LARGE ENOUGH OR LONG ENOUGH TO RESULT IN IGNITION, IT CAN PREHEAT THE SURFACES AND THUS MAKE THEM MORE VULNERABLE TO IGNITION FROM A FLAME CONTACT EXPOSURE. WITH ANY ONE OF THESE EXPOSURES, IF NO ONE IS AVAILABLE TO EXTINGUISH THE FIRE AND ADEQUATE FUEL IS AVAILABLE, THE INITIALLY SMALL FIRE WILL GROW INTO A LARGE ONE.*

*ONE OF THE MISCONCEPTIONS ABOUT HOME LOSS DURING WILDFIRES IS THAT THE LOSS OCCURS AS THE MAIN BODY OF FIRE PASSES. RESEARCH AND ON-THE-GROUND OBSERVATION DURING WILDFIRES HAVE BOTH SHOWN THAT THE MAIN FLAME FRONT MOVES THROUGH AN AREA IN A VERY SHORT TIME: ANYWHERE FROM 1 TO 10 MINUTES, DEPENDING ON THE VEGETATION TYPE (BUTLER ET AL. 2003; RAMSAY AND RUDOLPH 2003). HOMES DO NOT SPONTANEOUSLY IGNITE-THEY ARE LOST AS A RESULT OF THE GROWTH OF INITIALLY SMALL FIRES, EITHER IN OR AROUND THE HOME OR BUILDING.*¹

¹ Quarles, Stephen L. et al. (2010, May). Home Survival in Wildfire-Prone Areas: Building Materials and Design Considerations. University of California, Agriculture and Natural Resources, Publication 8393, 1-2.

Based on these findings and research noted above, the Wildfire Defense Program Presuppression and mop-up strategies are designed to mitigate the potential for home ignition before, during and after the threat of wildfire.

Examples of Common Wildfire Threats includes but is not limited to:

- A. Firebrands (embers) are lofted through the air ahead of a fire and land within combustibles near a home which leads to an ignition. These ignited combustibles expose the home to a combination of radiant heat and direct flame contact which damages the home. (Energy Transfer Processes: Radiation and Conduction)
- B. Firebrands are lofted through the air ahead of a fire and are blown into vented areas of the home such as crawl spaces, soffits and attics. The firebrands lead to an ignition within the home and the home is damaged. (Energy Transfer Process: Conduction)
- C. Firebrands lofted through the air ahead of a fire land on combustibles on the roof and in the gutters such as leaf litter, needlecast or wooden shingles and ignite the roof which results in damage to the home. (Energy Transfer Process: Conduction)
- D. A nearby fire ignites any combination of combustibles or vegetation within 100 feet of the home and creates sufficient radiant heat to cause ignition of the home. (Energy Transfer Process: Radiation)
- E. A smoldering ground or surface fire moves through continuous fuel near the home without an open flame until it comes in contact with a combustible component of the home or adjacent fuel and ignites the home causing damage to the home. (Energy Transfer Process: Conduction)

- 1.3. **Zonal Presuppression Strategies.** Presuppression is performed on and near structures to decrease the likelihood of home ignition from embers, radiant heat and direct flame contact. Effective Presuppression allows a home to have a higher probability of withstanding a wildfire's impact without damage. Mop-up activities performed immediately after a firefront passes near a home further enhances the effectiveness of the presuppression work. This combination of well-timed tactics results in a "structural save" when the home/structure remains intact with little or no damage from wildfire (does not include smoke damage). Presuppression work is divided into specific tactics within specific zones of the Home Ignition Zone (HIZ) as described below.

- A. **ZONE 1, 0-5 ft. around the perimeter.** *"THE OBJECTIVE OF THIS ZONE IS TO REDUCE THE CHANCE OF WIND-BLOWN EMBERS FROM A NEARBY FIRE LANDING NEAR THE HOME, IGNITING COMBUSTIBLE DEBRIS OR MATERIALS AND EXPOSING THE HOME TO FLAMES. THIS ZONE IS CLOSEST TO THE HOUSE, SO IT REQUIRES THE MOST CAREFUL...MANAGEMENT OF VEGETATION AND OTHER MATERIALS."*² Presuppression activities may include but not limited to removing

² Wildfire Home Assessment & Checklist. *Insurance Institute for Business & Home Safety*. 2.

combustibles, sealing vents, securing openings, wetting vegetation, installing sprinkler systems, the use of Class A foam or fire blocking gel.

B. **ZONE 2, 5 ft.–30 ft. around the perimeter (or to the property line).** *“THE OBJECTIVE OF THIS ZONE IS TO CREATE AND MAINTAIN A LANDSCAPE THAT, IF IGNITED, WILL NOT READILY TRANSMIT FIRE TO THE HOME.”*³ Presuppression activities may include but not limited to removing combustibles, wetting vegetation, installing sprinkler systems, the use of Class A foam, application of fire blocking gel or the construction of vegetative fuel breaks.

C. **ZONE 3, 30 ft. - 100 ft. (or to the property line).** *“THE OBJECTIVE OF VEGETATION MANAGEMENT IN THIS ZONE IS TO REDUCE THE ENERGY AND SPEED OF THE WILDFIRE.”*⁴ Presuppression activities may include but not limited to removing combustibles, wetting vegetation, installing sprinkler systems, the use of Class A foam, application of fire blocking gel or the construction of vegetative fuel breaks.

- 1.4. **Documentation of Structural Saves.** As defined previously, Structural Saves occur when a home is threatened by wildfire, **and** receive Presuppression or mop-up tactics **and** survives the fire event with little to no damage. Ideally, if a structure receives Presuppression work and is subjected to a wildfire, there will be no evidence of fire damage on the property or home. Presuppression tactics are designed to work in concert and reduce the probability of ignition within the Home Ignition Zone (HIZ). **If this work is completely effective there will be very little if any evidence of an ignition or ignition source within the HIZ.**

Experts and authorities including USFS, FEMA, NFPA, IBHS and University of CA, Division of Agriculture and Natural Resources agree the most prominent threat from wildfires comes from embers that are generated by the fire and lofted by winds far ahead of the fire. Based on this phenomenon it is unusual to see a flaming fire front in the vicinity of a home. Rather, lofted embers cause small ignitions called “spot fires” near the home which lead to a home ignition. Since this is the most common process of damaging or destroying a home it is therefore unusual to see evidence of a fire which burned to the edge of one’s property due to the absence of a flaming fire front. This may create a significant challenge when documenting a structural save. Firefighters may not be present at a home when the fire moves through or near the area due to federal safety protocols. The best evidence for program effectiveness becomes the condition of the home and its surroundings after the fire threat has ceased. Using the definition above combined with photographic evidence that no property damage has occurred is the best method for documenting a structural save.

³ Ibid.

⁴ Ibid.

Homes can be considered a “save” even though a firefront did not reach the home. **It is critical to photo-document all the conditions leading to a save including:**

- ✓ Firebrands or ash fallout on property and structure. Use clear close-up photos and include an item such as a pen to demonstrate the size of the firebrand.
- ✓ Nearby ignitions, smokes, char, burned vegetation, evidence of heat, etc. Focus on the HIZ within 50’ of the home.
- ✓ Neighboring homes burned or destroyed. Try to get both homes in one photo to show perspective and distance to destroyed home.
- ✓ Partial damage to the home especially along base area.
- ✓ Any burned vegetation within 5’ of the home.
- ✓ Any fire condition that could be deemed a threat to the home within ¼ mile.
- ✓ Use intuition and personal experience to identify and photograph any condition you feel could have caused damage to the home.

- 1.5. **Summary.** It is evident that the primary and likely wildfire threat to a home is borne from embers and the secondary and less likely threat is borne from a flaming front of fire. Any metric for Program effectiveness must take this into consideration or the potential to record structural loss preventions will be markedly reduced. An applicable metric must include the ability to document saves from both ember and flaming front threats.

The Wildfire Defense Program is designed to protect a home from both types of wildfire threat however the focus is on protection from ember threat because the **majority of homes destroyed are from ember-caused ignitions**. The program metrics for structural loss prevention should include ember threat in order to capture the full spectrum of structural loss prevention. According to Steve Quarles, Ph.D. and leading fire scientist with the Insurance Institute for Business and Home Safety, “burning embers are the most important cause of home ignitions.”⁵

⁵ Quarles, Stephen L. (2012. April 25). Vulnerabilities of Buildings to Wildfire Exposures. <http://www.extension.org:80/pages/63495/vulnerabilities-of-buildings-to-wildfire-exposures>.