

PURPOSE

This structural protection plan is designed to provide structural resources with common expectations, procedures and terminology in order to execute efficient structural protection during wildland fire/urban interface incidents.

PROCEDURE

The components of effective structural protection are based on the integrated actions surrounding three critical actions; Structural Triage, Structural Preparation and Defensible Tactical Action. The successful implementation of these actions is based on the following critical factors: TIME, RESOURCES and FIRE CONDITION. These factors must be strongly considered in the decision making of when and how to execute the critical structure protection actions.

I. Structural Triage

Utilization of the OSFM Structural Protection Checklist should be utilized when triaging structures with the goal of placing each structure in one of the following categories. These categories will be utilized to determine the structural prep and defensible actions given consideration of available time, resources and fire condition.

<p>Defensible – Stand Alone (Low Risk)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Safety zone present <input type="checkbox"/> Requires little or no attention <input type="checkbox"/> Will require patrol or homeowner presence after fire passage 	<p>Non-Defensible – Prep and Go (High Risk)</p> <ul style="list-style-type: none"> <input type="checkbox"/> No safety zone present <input type="checkbox"/> If time allows, rapid mitigation, apply foam or gel <input type="checkbox"/> Set trigger point for safe retreat <input type="checkbox"/> Go to nearest safety zone, return to area after fire passage
<p>Defensible – Prep and Hold (Moderate Risk)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Safety zone present at or near structure for apparatus and firefighters <input type="checkbox"/> Structure has a higher probability of ignition without firefighter intervention 	<p>Non-Defensible – Check and Go (Extreme Risk)</p> <ul style="list-style-type: none"> <input type="checkbox"/> No safety zone present <input type="checkbox"/> Inadequate time for mitigations <input type="checkbox"/> If time allows, ensure lives are not threatened <input type="checkbox"/> Set trigger point for safe retreat <input type="checkbox"/> Go to nearest safety zone, return to area after fire passage

II. Structure Preparation

Structural preparation is executed based on the Structural Protection Checklist and is a factor of TIME, RESOURCES and FIRE CONDITION. If a fire front is imminent or highly likely the goal is to defend what can be saved and accomplish as much of the Structure Prep Priorities as feasibly possible. This section is intended to provide structural protection resources with a clear guideline of what structure prep objectives are expected based on the mode of operation. This is a critical component of the structure prep plan, if there are other actions not addressed in this plan it is recommended that those actions are discussed with the appropriate supervisors.

Prioritize Structural Prep Actions based on the greatest chance of savability. Complete prep actions on the structures using the following order.

1. **Low Risk- Stand Alone.** Reinforce and ensure prepped for standalone defense.
2. **Moderate risk- Prep and Hold.** Time sensitive, these structures provide biggest gains.
3. **High Risk- Prep and Go.** Time sensitive.
4. **Extreme Risk- Check and Go**

Structure Prep Priorities

The following outlines the order of priority in which preparation should be conducted. Two general levels of structure prep are identified: Surface Prep and Full Prep. The three critical factors of time, resources, and fire condition will determine which level and priority should be accomplished. This determination may occur in conjunction with the Division/Group Supervisor.

Depending upon these critical factors, attempt to accomplish as much as feasibly possible starting with Surface Prep priorities down through the Full Prep priorities. *The ultimate goal with any of the following prep work is to minimize and/or eliminate the direct flame contact to the edge of a combustible building material.*

SURFACE PREP

Should always be completed first. Allows crews to conduct initial prep work without physically altering structures or property providing crews opportunity to conduct work if fire front is not imminent and it is unclear if fire front will affect the area.

Priority #1 ROOF (critical ignition component)

- Clean out gutters and ember traps at the vertical intersections and horizontal surfaces, remove receptive fuel beds, leaves, needles, debris and any other flammable materials on or attached to the roof.
- If fire is imminent, flush gutters with water and plug down spouts.

Priority #2 INTERIOR

- Close windows.
- Turn lights on, close interior doors and unlock and shut exterior doors.

Priority #3 EXTERIOR

- Relocate easy to move flammable/combustible items surrounding structure (lawn furniture, toys, propane cylinders, gas cans etc.) to an area of cover or outside preparation perimeter (garage, shed, barn etc.).
- Clear decks, walkways and other areas of light receptive fuels (leaves, needles ect.). Consider base of exterior walls, decks or other areas of adjoining combustible surfaces of the structure.

FULL PREP

Complete Surface Prep priorities first and then determine which of the following Full Prep tasks need to be/can be completed.

Priority #4 EXTERIOR

- Remove receptive fuels adjacent to the structure 5-10 feet (fine dead fuels, leaves, grass, bark dust, firewood, etc).
- Cover attic and basement vents. (metal window screen is preferable). Consider foil in areas susceptible to ember traps.
- Shut off gas, LP/NG.
- Remove attached fences 10 feet from structure for access and removal of combustibles.

Priority #5 SECONDARY PRIORITIES

- Remove vegetation within 30 feet of structure scatter flat.
- Limb trees 5 to 7 feet from ground and remove receptive fuels from underneath around drip line of trees.
- Remove debris and ember traps around structure.
- Remove lawn furniture and toys- place in home if possible.
- Remove and scatter wood pile or cover to avoid ignition by ember shower.
- Move cars if possible.
- Construct hand-line around structure, outbuildings, or immovable fuel sources/hazards.
- Consider burn out plan. If needed, develop and communicate to appropriate supervisor.
- Consider use of sprinkler kits. Only if adequate structural prep has been obtained.
- Consider use of structure wrap or fire gels.
- Consider extreme prep tactics (additional limbing or falling of trees).
- Consider egress preparation. Limbing/brushing 5 to 10 feet on either side of road/driveway.
- Consider the need for escape route, Temporary Refuge Area (TRA) and/or Safety Zone preparation.

FIRE IMMINENT

Consider when fire front is imminent and structure is categorized as defensible.

- ❖ Fire imminent- fire front directly threatening structures, estimated to impact area within 30 minutes.
 - Determine defensible action.
 - Stretch hose lines.
 - Ladder roof, hose to roof.
 - Initiate Structural Prep Priorities if not already complete- Start with Surface Prep and complete as much as possible before initiating defensible stand.
 - Consider use of foam on and around structures.
 - If time plug downspouts and fill gutters with water.
 - Consider burn out operations.

III. Defensible Tactical Action

The following tactical actions allow firefighters combating an urban interface wildland fire to utilize common terminology and actions in order to safely and effectively defend structures. Consider and coordinate LCES and utilization of **PACE** (Primary, Alternate, Contingency, Emergency) planning upon initiating tactical action.

Primary Tactical Action

Primary tactical actions are based on the triage category and level of structure prep accomplished prior to arrival of fire front. Primary tactical action may be supplemented or transition to another primary action or secondary tactical action as needed.

1. STAND ALONE

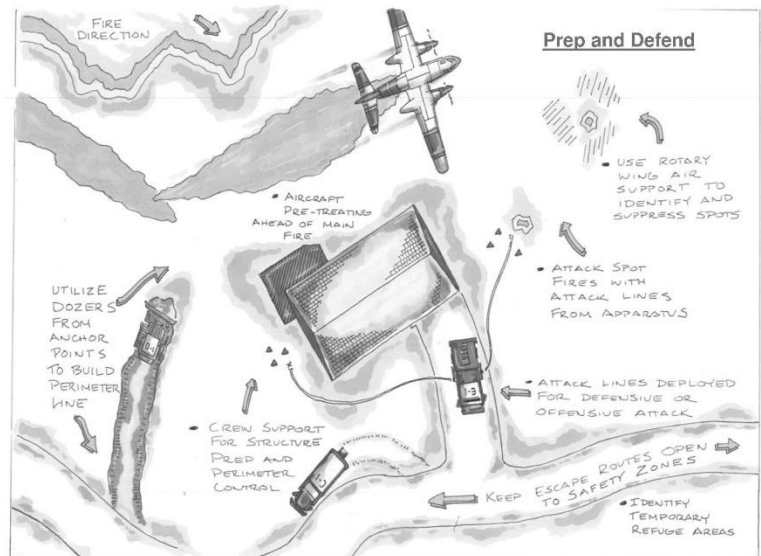
Triage Category: Defensible (Low Risk)

- **Purpose:** Adequate safety zones and escape routes allow for safe and effective preparation and defensible stand.
- **Indicators:** Structure requires little or no preparation or protection.
- **Actions:** Ensure adequate structural preparation measures are in place. If needed make defensible stand as fire front approaches.
- **Considerations:** Situational awareness. Tactical patrol before and after fire front. Increased possibility of occupants holding in place.
- **Secondary Tactical Action:** Tactical Patrol, Mop Up

2. PREP & DEFEND

Triage Category: Defensible (Moderate Risk)

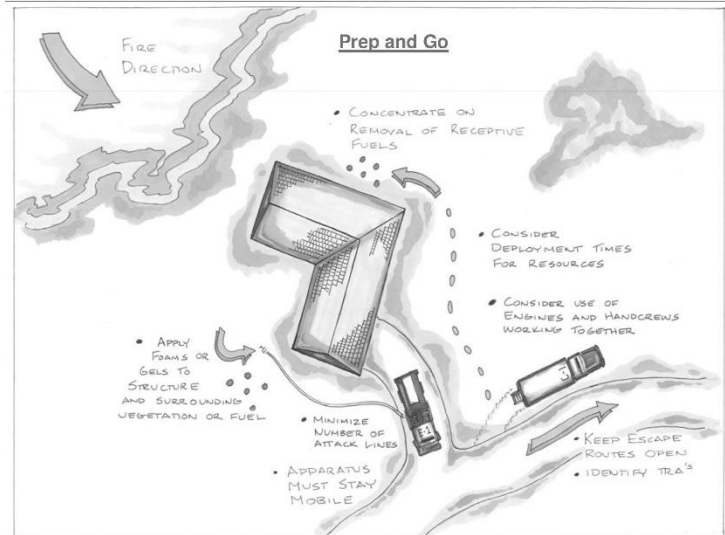
- **Purpose:** A tactic used when it is possible for fire resources to stay and defend structures as the fire front arrives.
- **Indicators:** Safety zones, TRAs, and escape routes are present and adequate time allows for safe preparation of structure for defense prior to fire front impact.
- **Actions:** Aggressive structure prep following Structure Prep Priorities. Adequate time, resources and conditions to make a defensible stand as fire front approaches.
- **Considerations:** Situational awareness, escape routes and safety zones must be identified and maintained. Utilization of PACE planning in case of adverse fire behavior changes. Fire behavior must allow for firefighters to safely remain in place and engage the fire.
- **Secondary Tactical Action:** Anchor and Hold, Bump and Run, Tactical Patrol, Mop Up.



3. PREP & GO

Triage Category: Defensible (High Risk)

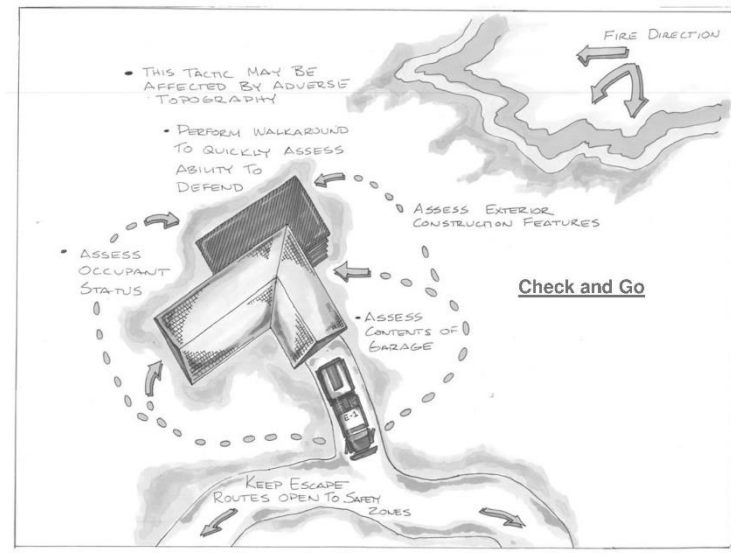
- **Purpose:** No safety zone present.
- **Indicators:** Time allows for rapid mitigation measures.
- **Actions:** Rapid triage, prep and retreat to TRA or Safety Zone.
- **Considerations:** Set trigger point for safe retreat and re-engage tactical action.
- **Secondary Tactical Action:** Bump and Run, Retreat and Re-engage, Tactical Patrol, Mop Up.



4. CHECK & GO

Triage Category: Non-Defensible (Extreme Risk)

- **Purpose:** Inadequate defensible space prohibits safe defense actions.
- **Indicators:** Extreme fire behavior, compressed time constraints.
- **Actions:** Rapid evaluation to check for occupants who may require removal or rescue, then withdraw to a Safety Zone.
- **Considerations:** Retreat and return re-engage action when able.
- **Secondary Tactical Action:** Retreat and Re-engage, Tactical Patrol, Mop Up.

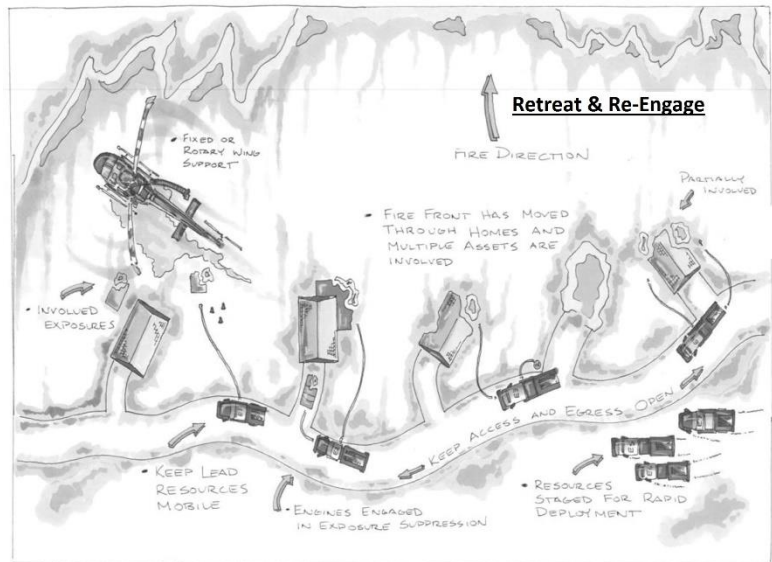


Secondary Tactical Action

Secondary tactical action should be utilized to supplement and support the primary tactical action.

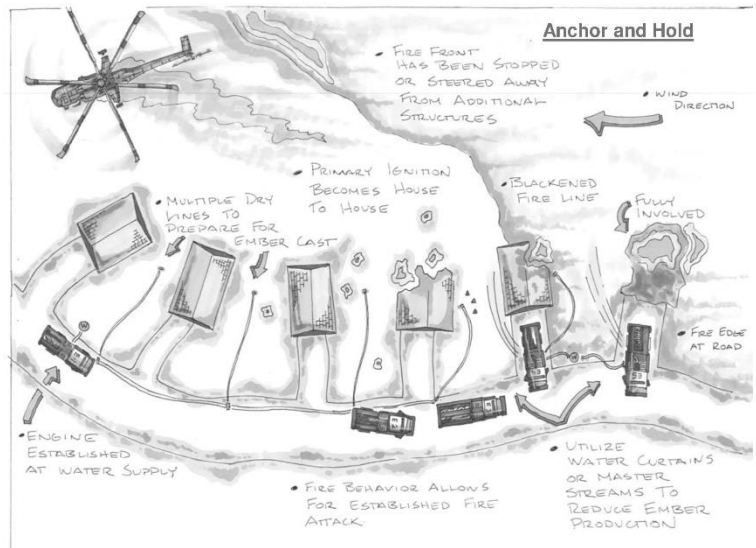
1. RETREAT & RE-ENGAGE

- **Purpose:** Follow up tactic used when Check and Go, Prep and Go or Bump and Run tactics are initially used.
- **Indicators:** When there is insufficient time to safely set up ahead of the fire or the intensity of the fire would likely cause injury to personnel located in front of the fire.
- **Actions:** Retreat to TRA or safety zone and return behind the fire front to search for victims, minimize property loss, effect perimeter control, extinguish hot spots around structures, control hot spots and reduce ember production.
- **Considerations:** Adequate escape routes, TRA and safety zones



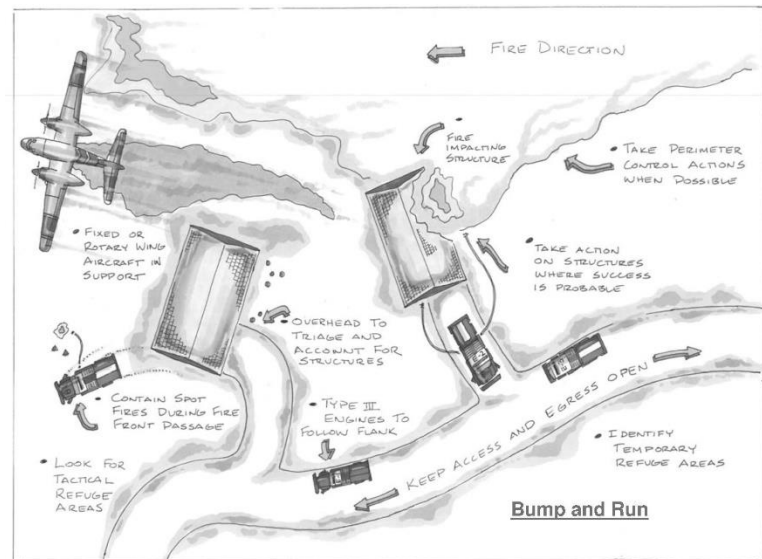
2. ANCHOR & HOLD

- **Purpose:** Defend exposures, stop structure to structure ignitions, reduce ember production and extinguish structure fires.
- **Indicators:** Primary mechanism of fire spread is STRUCTURE to STRUCTURE in common neighborhoods or commercial areas.
- **Actions:** Tactical utilization of control lines and large water streams from fixed water supplies.
- **Considerations:** Only utilized when water supplies are abundant. Utilization of gels and class "A" foams to assist in mop-up and prevent secondary ignitions.



3. BUMP & RUN

- **Purpose:** Often used when inadequate resources are available to conduct perimeter control or other structure defense tactics.
- **Indicators:** Defensive tactic when fire front impact is imminent. Offensive tactic when resources are attempting to steer the fire to an established end point where other resources have prepared control lines. Structure prep is minimal due to compressed time constraints.
- **Actions:** Resources move ahead of the fire front to extinguish spot fires, hot spots and defend structures. Resources remain mobile, able to maneuver quickly, leapfrogging from one structure to another.
- **Considerations:** Situational awareness and utilization of PACE Planning. May involve direct attack with fire line and firing operations. FFs must move if structures become involved and quick knockdown cannot be achieved. Utilization of additional resources behind “bump and run” for perimeter control and tactical patrol.



4. TACTICAL PATROL

- **Purpose:** Tactic used before or after fire front that relies on mobility of assigned resources to continually monitor assigned areas.
- **Indicators:** Tactical patrol should be initiated before or after fire front, in which active or smoldering fire presents risk to structures, established fire lines, or identified areas of significance.
- **Actions:** Patrol and monitor identified areas of risk for potential spot fires in front of fire front or for hot spots, rekindled fires and hazards after fire front has passed. Initial action and/or request for resources should be initiated to mitigate any potential threats identified while conducting tactical patrol.
- **Considerations:** While patrolling areas in front of fire maintain awareness downwind of fire for potential ember showers and spot fires. After fire front has passed, tactical patrol may be utilized in conjunction with mop up operations. Good communication and coordination with other resources should be maintained to ensure that potential threats or hazards are identified and mitigated accordingly.

5. MOP UP

- **Purpose:** Tactic used after the fire front has passed to extinguish hot spots and smoldering fires in designated areas
- **Indicators:** After fire front has passed in which hot spots and smoldering fires present secondary risk to structures or fire line integrity. Mop up is a critical component to securing an area and should be considered immediately after the fire front has passed.

- **Actions:** Mop up should be initiated in areas that present the greatest threat. Hazards and snags should also be identified during mop up operations and mitigated according to operational objectives. Mop up actions may be in conjunction with identified mop up standards identified in the incident operational objectives.
- **Considerations:** It is easy for firefighters to become complacent during mop up operations. It is important to maintain LCES and situational awareness during the mop up phase of a fire. Strong consideration should be given to local fire behavior and weather patterns. While mop up can be a time consuming and rigorous task, it is important that efforts and resources are applied to ensure that hot spots and smoldering fires are properly mitigated (i.e. removal of scorched or flashy fuels, avoidance of cold-capping).

SPECIAL CONSIDERATIONS

Safety Zone- A preplanned area of sufficient size and suitable location that is expected to protect fire personnel from known hazards without using fire shelters.

Temporary Refuge Area (TRA)- A preplanned area where firefighters can immediately take refuge shelter and short-term relief without using a fire shelter in the event that emergency egress to an established Safety Zone is compromised. Examples: lee side of structure, inside of structure, large lawn or parking area, inside apparatus.

NOTE: Although Safety Zones and viable escape routes shall always be identified in the WUI environment, they may not be immediately available should the fire behavior increase unexpectedly. Often a TRA is more accessible and will provide shelter and/or short term relief from an approaching fire without the use of a fire shelter. Utilization of a TRA will allow firefighters to develop an alternate plan to safely survive the increase in fire behavior.

Always have an exit strategy:

- **Employ tactical maneuver to avoid heat injury, move away from the fire**
- **Move to a Temporary Refuge Area (TRA)**
- **Withdraw along Escape Routes**
- **Move into a Safety Zone**

Firescope California. 2013. Wildland Urban Interface (WUI) Structure Defense