**Zone 0 (0-5 feet) Ember Resistant Zone**

**Purpose***:*

* Zone 0 reduces the likelihood of structure ignition by reducing the potential for direct ignition of the structure from flame contact, by embers that accumulate at the base of a wall, and/or indirect ignitions when embers ignite vegetation, vegetative debris or other combustible materials located close to the structure that result in either a radiant heat and/or a direct flame contact exposure to the structure.
* Zone 0 is the horizontal area within the first five feet around the structure and any outbuildings and attached decks, and stairs. The zone also includes the area under attached decks and stair landings. To be most effective, the zone should incorporate a 6-inch vertical area between the ground and the start of the building’s exterior siding. (*Note: the appropriate vertical height would be dependent on whether combustibles are retained in Zone 0 and coupled with Chapter 7A requirements. The Office of the State Fire Marshal is the regulatory authority for this vertical zone since this zone would be part of the built environment.)*
* Zone 0 is a critical component of structure defense and, when coupled with Zones 1 and Zone 2, is essential to defensible space.

The following table describes the workgroup’s review of individual components that commonly appear in the area immediately surrounding a building and attached decks. The workgroup has developed this list to help the Board of Forestry understand the items that the workgroup has evaluated and to provide analysis of each individual item. The workgroup was anonymously polled, and seven members shared their viewpoints on whether to recommend that these items be allowed in Zone 0. In general, implementing Zone 0 will be easier for new construction than for existing buildings.

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| **Proposed Action**  | **Allowable Item in Zone Zero** | **Fire Protection Benefits** | **Considerations** | **Committee Feedback** |
| No combustibles (vegetation, mulch, wooden structures) and no trees. Includes stored wood. | * Rock or other noncombustible mulch product (i.e., gravel, lava, decomposed granite)
* Statuary, fountain
* Attached decks and stairs
* Cement or stone pavers
 | Reduces the potential damage from ember deposition (and ignition) creating the potential for direct flame contact, and radiant heat exposure to the structure within the first 5 feet. | * Public awareness of Zone 0 is limited. Note the Mill Valley experience.
* Reduces need for interpretation from the D-space inspector or Authority Having Jurisdiction (AHJ)
* Easiest to maintain
* Retrofitting (existing buildings) will be more costly than implementing for new construction.
* Easier to implement with new construction
* Implementation more difficult for buildings built on a slope.
* Could link standards to decks meeting Chapter 7A compliance?
* The entire footprint of the under-deck areas needs to comply.
 | * This action provides the highest standard and greatest benefit for reducing the vulnerabilities to structures.
* 7 of 7 members of the workgroup agree that this should be allowable in Zone 0
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|  | Existing mature tree with the bole within or touching the Zone 0 perimeter. A mature tree would have branches above the roof, not under the eaves, and would have ladder fuels eliminated.  | None  | * May help in gaining public support and in providing shade for a building.
* Shade trees are identified in the green energy codes (5.106.12) and possibly in energy code guidance.
* Retaining trees adjacent to the building creates a regular source of needles, leaves, branches, and other items that will accumulate on or near the building.
* A mitigation could be to require noncombustible gutter covers? However, 7A will not apply to existing construction. It would be a change to ask a CAL FIRE inspector to evaluate construction details. LRA/SRA inspectors may have different training/skills.
* Easier to implement with new construction. (Note this applies to all Zone 0)
* If the tree is not maintained, there is some potential for an adjacent radiant heat source if the tree ignites.
* What would be the definition and characteristics of well-maintained tree?
* Tree type likely matters. Perhaps have a greater tolerance for hardwoods over conifers. The bole of palm trees are very fiberous. Will inspectors be able to identify tree types or tree characteristics? These concepts could also apply to Zone 1.
* When and under what fire exposures do trees serve as a radiant heat shield?
* The majority of trees on a property are likely out of Zone Zero.
 | 4 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Irrigated and mowed lawn (2-3 inches) | If green, yes | * May help in gaining public support.
* Thatch can burn under certain conditions.
* Homeowner practices vary, and this requires sufficient water to maintain grass during dry conditions (including drought).
* Grass is a one-hour fuel
* Without water, plant conditions change quickly.
* The presence of the vertical noncombustible zone could be helpful for the allowance of a mowed and dry lawn.
 | 5 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Synthetic lawn | None | * They are a petroleum-based product.
* Need to research how many have a fire-rating? SYNLawn has met ASTM E 10 Class A in a roofing application. How would an inspector know what the rating is?
* IBHS experiments suggested that they can be subject to smoldering ignition. A flaming exposure study conducted by NIST suggested significant BTU production and flame heights.
* Combustible materials may accumulate on the surface. Their ignition would result in a flaming exposure.
* Hazard does not change seasonally
* The presence of the vertical noncombustible zone could be helpful for an allowance
 | 1 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Irrigated, non-woody, herbaceous plantings, with separation between groupings.The workgroups definition: All ground cover (< 3” in height) and plants (< 16“ in height) shall be minimally set back from structures, decks, and other plants 1.5 times the height of the plant or 12-inches, whichever is greater. Ground covers and plants shall have high water content. No combustible mulch. | None | * Will help with public support
* The more vegetation allowed in Zone 0, the more likely the fire protection benefits will be compromised.
* Plants shed leaves and will require ongoing maintenance.
* What type of mulch is incorporated? Combustible mulches may be added for water retention, creating an additional vulnerability.
* Noncombustible mulch could be between plantings.
* This green vegetation can catch leaves, needles, and other debris, allowing for unanticipated accumulations of combustibles.
* Note that the vertical zone may need to increase in height if these combustibles are allowable.
* Could be difficult to interpret
* Allowable height and spacing for non-woody plants? What about decorative grasses?
* Succulents could be difficult to evaluate as many thatch and can be woody (e.g., ice plant is woody).
* Could home hardening actions be used to mitigate these additions? Such as siding type and assembly, proximity to windows and combustible doors, etc.
 | 5 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Combustible decorative structures (trellis, pergola, shade covering, planters, privacy wall, etc.)Generally, these structures are detached if they are located within the 5 feet zone.Structures that rest upon deck?Often unpermitted. | None | * Will help with public support
* Depending on the dimensions of the combustible materials and arrangement, these structures may compromise the fire protection benefits. These structures also weather, and their vulnerability increases over time. How they are constructed also affects vulnerabilities.
* Workgroup interpretation: if these structures are a part of the deck, they would not be evaluated; however, the vegetation would be evaluated.
* If made of ignition-resistant material or ignition-resistant construction, would these be allowable?
* There is guidance under 7A for detached misc. items
 | 1 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Combustible gate or fence that attaches to the building within Zone Zero. | None | * A combustible fence can transmit fire to the home via an attached gate.
* The gate can be replaced using noncombustible materials.
* Perpendicular attachment is the concern.
 | 0 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Combustible fence running parallel to the building within Zone Zero. | None | * Helps with public support
* More difficult to implement for existing construction
* Combustible fences directly ignite from embers on a privacy fence, less lightly on a good-neighbor fence. Or embers ignite adjacent vegetation that can ignite the fence.
* Use of a steel fence along the property line, parallel to neighboring homes, would provide protection should one home ignite (Australia Bushfire CRC study)
* Could home hardening actions be used to mitigate the presence of the fence?
 | 3 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Covered storage facilities (facilities and sheds that could include firewood, tools, pumps, etc.) | None, unless built to the most restrictive Chapter 7A compliance options. | * Helps with public support
* Difficult to implement
* If made of ignition-resistant material or ignition-resistant construction, could these be allowable?
 | 0 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Bender board, (combustible) | Potentially beneficial, if noncombustible | * Petroleum-based boards are the concern; however, some can be made of metal or cement.
* Used to separate garden beds and their placement can lead to the house or follow fence lines
 | 3 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Landscape materials (lumber or round logs, railroad ties, creosote-treated, pressure-treated)  | none | * Always combustible
* Used as retaining walls
* Fences are often adjacent
* Logs can be used to make garden bed separation or create height
* Can be buried
 | 1 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Potted plants combustible pot (decorative wine barrels, wood pots) | None | * What plant is involved?
* Woody plant?
* Plant conditions can change throughout the season.
 | 0 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
|  | Potted plants noncombustible pot (cement, metal, ceramic) |  | * What plant is involved?
* Woody plant?
* Plant conditions can change throughout the season.
 | 5 of 7 members of the workgroup agree that this should be allowable in Zone 0 |
| **Address each item below as a part of an educational strategy and note their specific vulnerabilities** |
|  | Garbage, recycling, compost receptacles. Dumpsters associated with commercial buildings and apartments. | None | * Helps with public support
* Difficult to enforce.
* Could require that these receptacles be stored in a noncombustible structure in Zone 0.
* Could an educational strategy be used to ask that these items are relocated during wildfire evacuation?
 |  |
|  | Vehicles | None | * Helps with public support
* Difficult to implement
* NIST post-fire evaluations have identified ignited RV’s / trailers as one of the pathways for fire spread to the home
* Could an educational strategy be used to ask that these items are relocated during a wildfire?
 |  |
|  | HVAC, heat pumps, swamp cooler on a combustible surface | ? | * What are they placed upon? A combustible deck or noncombustible surface?
* Elevated platform or on ground?
* May trap debris
* Exposed pipes may have insulation that connects to the house
* Is there any data to suggest they are a problem? (Workgroup observation has noted their issue)
* Covered under engineering code for new installation and likely out of the BOF authority.
* Use an educational strategy and what people do to hide the structure.
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|  | Outdoor kitchens | none | * Propane tanks common
* Wood cabinets
* Stored combustibles
* May trap debris
* May have their own covering or roofing
* Located on patio or deck?
* Use an educational strategy and identify their unique vulnerabilities.
 |  |
|  | Attached patio covers, retractable awnings,other shade structures (vertical or horizontal), umbrellas  | none | * If attached to the structure, not subject to Zone 0.
* Type of construction materials vary, often made of synthetic materials
* Can catch debris and embers
* Use an educational strategy and identify their unique vulnerabilities.
 |  |
|  | Portable BBQs | none | * Common on decks or in Zone 0
* Hazard is the propane tank
* Multi-family building have their own guidance
* Could an educational strategy be used to ask that these items are relocated during a wildfire?
 |  |
|  | Pet and animal structures  |  | * Generally combustible
* Often trap debris and embers
* Location matters
* Many of these structures are small and can be relocated during a wildfire. Chicken coop or rabbit hutch may be an exception.
* Could an educational strategy be used to ask that these items are relocated during a wildfire?
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**Zone 1 (5-30 feet) Lean, Clean, and Green Zone**

**Purpose**: Zone 1 reduces the likelihood of fire burning directly to the structure. This is accomplished by modifying fuels and creating a discontinuity between planting groups that limits the pathways for fire to burn to the structure and reduces the potential for near-to-building ember generation and radiant heat exposures. An additional purpose of this zone is to provide a defendable zone for fire personnel to stage and take direct action.

*Note: A similar table to Zone 0 is in development that will recommend minor changes and clarifications to Zone 1.*

**Zone 2 (30-100 feet) Reduced Fuel Zone**

**Purpose:** Zone 2 actions are designed to reduce the potential behavior of an oncoming fire in such a way as to drop an approaching fire from the crown to the ground. Fuel modification includes removing dead vegetation and reducing living vegetation to eliminate fuel ladders and create vegetation separation between individual or islands of trees or shrubs. These vegetation modification requirements are more significant for those properties with steeper terrain, larger and denser fuels, highly volatile fuels, and areas subject to frequent fires. Additional benefits of the Zone 2 include facilitating direct defense actions, improving the function of Zones 0 and 1 by reducing the flame heights, and the potential for ember generation and radiant heat exposure to structures.

Should we include this existing language? Actions include the removal of all dead and downed brush and trees, the thinning of all species to break up the fuel continuity, the elimination of ladder fuels, and the trimming up of all living fuels. Fuel reduction means arranging trees, shrubs, and other fuels so that it is difficult for the fire to transfer from one fuel source to another.

*Note: A similar table to Zone 0 is in development that will recommend minor changes and clarifications to Zone 2.*