



A Tradition of Stewardship
A Commitment to Service

Planning, Building & Environmental Services

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Proposed Fire Resistive Measures

1. Reduced Length of Eaves

Eaves are an extension of the roof structure beyond the exterior walls of a building. During a fire, hot air can be trapped underneath the eaves, circulate in a vortex pattern, and rapidly heat the materials of the structure until it combusts. The longer the eave length, the more hot air would be trapped underneath.

Currently, the California Residential Code proscribes the materials that must be used for the underside of roof eaves for the purpose of fire resistivity. The CRC allows for flexibility in those materials, but all of the options reduce the flammability of the structures. However, there is no standard for the length of eaves in the California Residential Code. Many local jurisdictions have different local standards to address local conditions, such as snow accumulation, sun exposure, and building density. Because the length of roof eaves correlates to the length of exposure to extreme heat during a fire event, the Building Division proposes establishing a limit to the length of roof eaves such that they extend no further than 18 inches from the exterior wall, measured at a 90 degree angle from that wall.

2. Accessory Structures

Accessory structures, such as sheds, gazebos, trellises, and patio covers, often provide additional fuel for wildland fires. When those structures are placed near a residence or other building, they act as kindling, allowing the fire to gain in intensity as it approaches a structure. Further, the fire can more easily jump from these accessory structures to the main dwelling.

The California Residential Code does not require small accessory structures to be constructed of fire resistive materials unless they are attached to, or installed within 3 feet of, a building. However, the code does permit local agencies to impose that requirement on all accessory structures within 50 feet of the building. The Building Division recommends adopting that amendment to require that all such accessory structures are constructed of fire-resistive materials. The amendment would also clarify that "Attached miscellaneous structures" includes patio covers, trellises, and carports.

3. The California Residential Code allows a local agency to require enclosed attics, enclosed eave soffit spaces, and enclosed rafter spaces. By eliminating openings to the attic, air born embers are less likely to enter the structure reducing the possibility of ignition within the structure where fire has the ability to spread unchecked and far more rapidly.

- **Section R337.6.1 General** currently reads:

Where provided, ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters and underfloor ventilation shall be in accordance with section 1203 of the California Building Code and sections R337.6.1 through R337.6.3 of this section to resist building ignition from the intrusion of burning embers and flame through the ventilation opening.

- **Proposed Amendment:**

All attics, enclosed eave soffit spaces, enclosed rafter spaces where ceilings are applied directly to the underside of roof rafters shall be in accordance with 1202.3 of the California Building Code and Section R806.5 of the California Residential Code.

4. Enclosed Underside of Decks and Balconies

Building appendages, such as decks, balconies, and other structures that extend beyond the building envelope are often constructed of wood materials that are more combustible than the main structure. Further, they frequently are exposed underneath the decking. This exposure poses an increased fire hazard, as it can funnel and trap heat and embers from a wildland fire underneath a flammable structure. A burning deck or balcony increases the contact between the main structure and the flames, which counteracts any other fire-resistivity measures for the structure.

The Building Division proposes adopting an amendment requiring one of two measures to reduce this phenomenon. The underside of a deck or balcony could be enclosed to the grade underlying the structure, which would eliminate the convection effect of hot air being trapped underneath the deck. Alternatively, the deck or balcony could be made of fire-resistant materials, including heavy timber construction material, so that the fast-moving wildland fires will not have time to light the structure on fire.

Conclusion

The building department has performed extensive research to determine the feasibility, benefits and cost associated with adopting more restrictive fire resistive measures for the construction of light framed residential construction. During the course of our research we looked at many different possibilities, based on the information found we have determined that the preceding measures would offer the most significant protection against the destruction of light framed construction caused by wildland urban fires.

It is our belief that all four of the proposed recommendations would offer a varied degree of protection depending on the magnitude of the fire event of which they are exposed to, however the cost associated with items 3 & 4 we feel would be far too cost prohibitive and burdensome to offset the fire protection achieved.

Recommendations one & two would offer additional fire protection without burdening the property owner with an overwhelming financial impact.