

Fire Engineering®

Construction Concerns: Cantilevered Balconies

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Balconies and second-floor decks have been built on single-family and multifamily residences for hundreds of years. In earlier times, they were usually supported by simple beams, whose loads were carried by the wall of the building on one side and by a row of columns on the other.

In modern lightweight-wood frame construction, these balconies and decks are often carried by cantilever beams, supported by the building wall on one side, unsupported on the other; and counterbalanced by an extension of the cantilevers to beams inside the floor-ceiling assemblies inside the building.



Photo 1 shows the framing for a second-floor deck on a house under construction. The cantilevered beams are dimensional lumber nailed together. Since this deck also serves as a canopy over the French doors on the first floor, it is supported on a beam of laminated veneer lumber (LVL) that is part of a load-bearing wall of 2x6 studs.

Photo 2 (next page) shows the connection of the cantilevered beams to the parallel-chord wood

floor trusses. Each beam is nailed into both the bottom chord of the truss and into each web member. A construction adhesive was used in addition to the nails, to prevent the nails from loosening in the future and causing the floor to squeak. This system of connection by adhesive and nails was designed by the architect and approved by the truss manufacturer's engineer. Connection of a cantilever to a parallel-chord wood truss is a modification of the truss by building-code definition, since it changes the way in which the truss members react to loads. It requires the approval of the truss designer before the modification is made.



The blueprints show that this system was designed to support a dead load of 15 pounds per square foot and a live load of 50 pounds per square foot, on both the interior floor and on the balcony. Although this may be plenty to support normal furniture and occupants in a bedroom and patio furniture, occupants, and beverages on a balcony, it may not be enough to support the dynamic load of a couple of fully equipped firefighters doing overhaul, especially if heat or fire has involved the trusses or

cantilevers below.

Photo 3 (right) shows the balcony with part of the plywood decking installed and some of the wood blocking installed between the ends of the wood trusses with the cantilever beams attached. Please note that this blocking is not firestopping, since it does not completely fill the opening between the wood joists and the wood trusses, and since it does not protect the ends of the wood trusses. Fiberglass insulation will be added to the inside, and



plywood sheathing will be extended to cover the outside of the building wall. The plywood deck will be completed and plywood paneling will be added to cover the underside of the deck. The connection between this cantilevered deck and the wood trusses will be completely concealed, as will its lack of firestopping.

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