

Feel the (Heart) Burn...

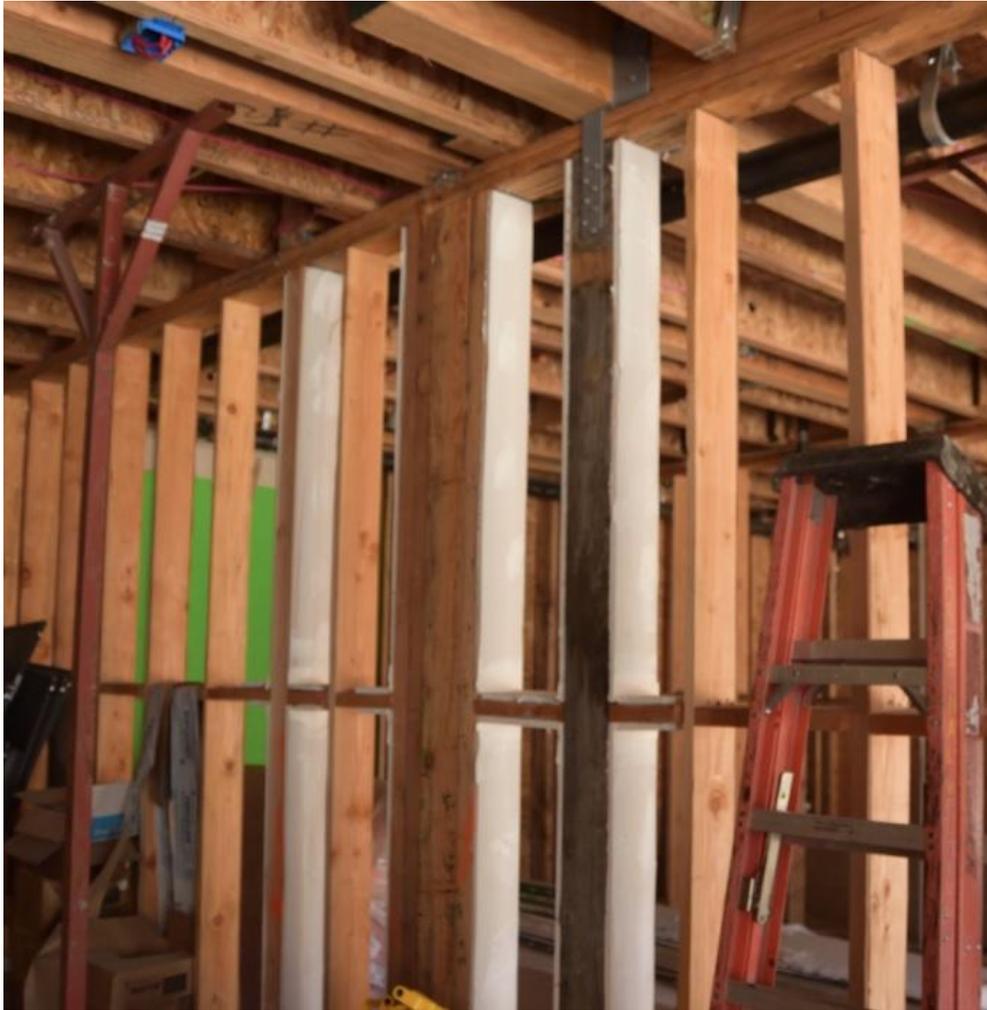


Figure 1 - Wood posts to be individually protected

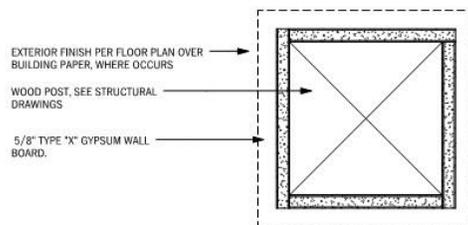
Once every 3 years, the International Code Council bestows the AEC profession with a set of engraved tablets that are intended to guide our practices in producing buildings that are safe and navigable for their occupants. Behind each provision undoubtedly lies good reason, or at least good intent, but users of the code could be forgiven in some instances for doubting this to always be the case.

One such example is Chapter 7, Fire and Smoke Protection. The particular example we feature here is the requirement to individually encase columns. The specific provision is found in 704.2 which states “*Where columns are required to have protection to achieve a fire resistance rating, the entire column shall be provided individual encasement by protecting it on all sides for the full column height...*” (Italicized emphasis added.)

Up until recently, it was widely understood that the columns referred to are those that are exposed and not occurring within walls. For type VA construction, a single layer of

5/8" Type X Gypsum wallboard furring is customarily used to address the requirement (Figure 2). However, the current Bay Area boom in multiunit housing has coincided with a rise in uncertainty about what is a wood column and where exactly columns are required to have individual protection. This has resulted in some jurisdictions taking the interpretation that *all* posts and columns, regardless of location and material, therefore need to be individually protected. With today's preference for homes with open floor plans thus requiring beams to break up joist spans, the resulting detailing of posts that occur within walls that are already fire protected is awkward at best (Figure 3).

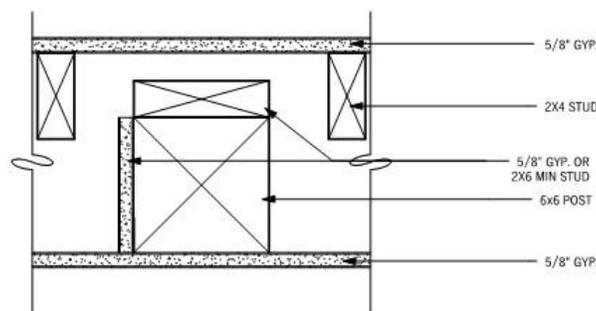
CBC TABLE 721.2.1.4(2)	
1 HR FIRE RATED	STC - N.A.



1 HR WRAP AT WOOD POST

SCALE: 3" = 1'-0"

Figure 2



FIRE PROTECTION AT PARTY WALL

Figure 3

A review of the provisions of Section 721.6.2, Calculated Fire Resistance of Wood Assemblies, demonstrates the basis of standard Type VA 1 hour wall assemblies: 40 minutes of Type X Gypsum wall board + 20 minutes of 2x wall studs = 1 hour of fire protection. Section 721.6.3 goes on to specifically address the durability of wood posts exposed on 3 and 4 sides. The lack of provisions for posts “exposed” on 2 sides, as is the case being called for in the aforementioned jurisdictions, is one indication the individual encasement of posts within membrane protected walls was not intended. Another is the use of computational tools provided in AWC Technical Bulletin 10 that provide guidance in calculating the ultimate load capacity based on char of wood members. The ratio of post-char capacity/original capacity of members for any char duration increases as the size of the member does.

Followers of IBC 704 may be aware that in 2012, columns went from “where columns are required to be fire resistance rated” to “where columns are required to have protection to be fire resistance rated”, and similarly obscure changes were made to provisions for secondary elements including king studs and shear wall boundary elements. While in the 2015 cycle, no changes were made in the language, recently approved changes to the 2018 IBC 704 language will finally demystify at least these provisions as they relate to wood posts. Specifically, it will provide an exception within light-frame construction section 704.1 that matches the standard of practice that has been in place for years.

704.4.1. Light-frame construction. Studs, columns, and boundary elements that are integral elements in walls of light-frame construction, and are located entirely between the top and bottom plates or tracks shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the wall.

This of course isn't slated for adoption until the 2018 code cycle, however it is expected that many jurisdictions will be forward-looking and welcome the clarity of the new provisions.

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