110.3.5

Type IV Connection Protection

CHANGE TYPE: Addition

CHANGE SUMMARY: A new inspection has been established, applicable only to Type IV-A, IV-B and IV-C construction, that deals with connections where fire-resistance is provided by wood cover.

2021 CODE TEXT: **110.3.5 Type IV-A, IV-B and IV-C connection protection inspection.** In buildings of Type IV-A, IV-B and IV-C construction, where connection fire-resistance ratings are provided by wood cover calculated to meet the requirements of Section 2304.10.1, inspection of the wood cover shall be made after the cover is installed, but before any other coverings or finishes are installed.

CHANGE SIGNIFICANCE: The inspection function is arguably the most critical aspect of building department operations. As the construction process moves forward, specified inspections of the work being done must be completed prior to such work becoming concealed and inaccessible for evaluation. A listing of the required inspections, where applicable, begins with a potential preliminary inspection and continues through various stages of the work, ending with a final inspection. The scope of each inspection is indicated and the extent of work to be available for inspection is provided. A new inspection has been established, applicable only to mass timber construction of Types IV-A, IV-B and IV-C, that deals with connections where fire-resistance is provided by wood cover.

Connections of structural members, and their protection to achieve a fire-resistance rating, represent a significant component of mass timber buildings' structural integrity, and therefore warrant a specific new

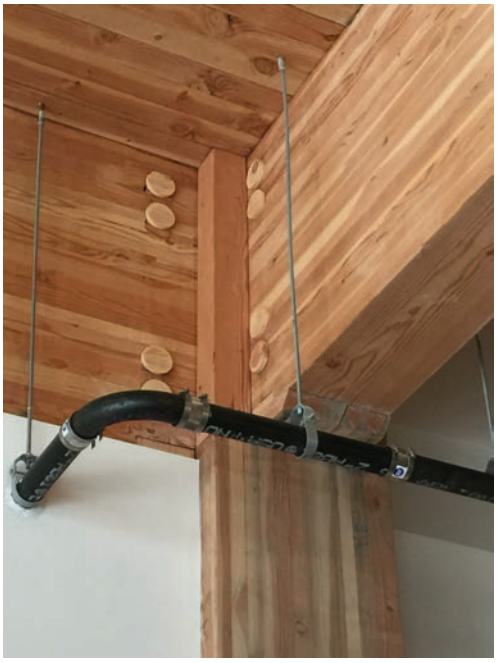

Photo courtesy of American Wood Council

Wood cover protection of structural member connections to achieve a fire-resistance rating.

requirement for building department inspections. Special inspections are not required for this aspect of construction as this field inspection process does not require any special expertise nor special tools for testing that are outside the day-to-day work of building inspectors. These new requirements are parallel to, and generally the same as, the inspection of fire-resistive protection for connections of traditional heavy timber that have been done in the course of building department inspections for more than 100 years. This mandate does not preclude the building official from requiring special inspections in special cases as established in Section 1705.1.1.

It is likely that designers will choose to overlay wood connections using additional wood cover that will protect the underlying wood and steel. This additional thickness of wood can be provided by oversizing the structural element or by adding a collar or other architectural embellishment at the connection. For oversized wood structural elements, the inspector will need to check the approved building plans to determine the required dimensions of the oversized structural element to be used to meet the fire-resistance rating. Where the plans indicate the addition of wood members to protect the connection, the inspector will need to verify that the additional wood members are in place and meet the minimum dimensions set forth in the approved construction documents.

Section 110.3.5, now reformatted as Section 110.3.6, has historically required the inspection of gypsum board when used as a component of fire-resistance-rated assemblies. The connection being protected may be steel-to-mass timber, concrete-to-mass timber, or any other combination of materials. Gypsum board is assigned a fire-resistance-rating time based on board thickness and other performance properties of the product, such as a Type X certification. When the connection protection calls for the addition of gypsum board to add fire-resistance time, the thickness, number of layers and other properties should be inspected.

It is also possible for additional material added at the connection location to be a combination of both gypsum board and wood. Architecturally, the designer may choose to add a $^{5}/_{8}$-inch Type X gypsum board collar, which is equivalent to 40 minutes of protection, and cover it with a layer of wood trim equivalent to 20 minutes of protection, thus providing 1 hour of protection at the connection location.