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Education Saves Lives: The Fire Performance of Wood Trusses — Part 4 by Molly E. Butz

The CSCI Fire Performance of Wood Trusses Educational Program helps making fire ground decisions easier by creating an understanding of component installation and inspection.

If you have had the chance to visit Carbeck Structural Components Institute's (CSCI) web site at www.carbeck.org, you've probably read through CSCI's key objectives, one of which is:

"Research and education of fire departments and firefighters with respect to how effectively and safely to put out fires in structures that include structural building components."

CSCI's Fire Performance of Wood Trusses Educational Program is an excellent example of this sort of undertaking. The first three sections of the fire education program focus on the history of the wood truss industry and the truss manufacturing process. This type of background information is very useful as it provides a foundation of understanding for individuals who are unfamiliar with structural components, the engineering and quality assurance involved in their manufacturing, and the diverse applications in which they are used. Section 4 of The Fire Performance of Wood Trusses immerses the student in shipping methods, onsite storage, installation, bracing and identification of wood trusses.

The information in the fourth section of the fire education program is delivered through the second in a series of videos narrated by Captain Timothy Neal of the Houston Fire Department (HFD). The video begins with a brief review of wood truss design, construction and testing. He tells viewers that, aside from fast food chains and large hotel or apartment complexes that often use several identical trusses, many buildings require that various different trusses be designed based on strength, size and performance standards, each one engineered for specific loading conditions and architectural requirements.

Captain Neal explains that once the trusses have been manufactured, they are loaded onto specially designed truss trailers; many that have roll-off beds, making delivery easier, safer and less prone to damage. Floor trusses are stacked vertically and roof trusses are stacked either vertically or horizontally depending on the size and type of trusses being loaded. Once the truck is at the site, the trusses are rolled off onto a dry, level surface. They can also be removed by hand, forklift or crane.

He points out that trusses that will be used in two weeks or less can be unloaded directly onto the ground, but trusses that will be stored on the construction site for more than two weeks should be stored covered and off the ground so they are protected from the elements. Horizontal onsite storage is common, but vertical storage is also acceptable as long as proper bracing is in place to prevent toppling. The Wood Truss Council of America (WTCA) has a wide

selection of educational materials that can help with truss storage, installation and bracing issues.

The wood truss installation process can be broken down in these four steps:

1. Hoist
2. Brace
3. Space
4. Nail into Place

Lifting the trusses into place can be done by hand, forklift or crane. The primary concern is to avoid lateral bending of the truss itself. For trusses with spans between 30' and 60' long, a load spreader bar should be use with a crane to help hoist them into place. Trusses more than 60' will require a strongback spreader bar for safe and proper placement. After the trusses have been lifted and lowered into place, they need to be properly braced and spaced to ensure safe building completion. While roof trusses are typically spaced 24" on-center, spacing for floor trusses can range from 16" on-center to 24" on-center.

The floor or roof decking should be applied as soon as possible after the trusses are set, as it adds stability to the system and helps weatherproof the structure. Captain Neal also points out the importance of lateral and diagonal bracing and explains that the various bracing needs are indicated on the truss design drawings and supplemental industry bracing information that accompany the delivery. The structural performance of the truss system relies on the completed bracing to help tie it all together.

The choice to use components or any type of structural framing in construction is based on these four things: cost, ease of installation, speed and flexibility of installation, and structural performance. Because components can reduce costs, simplify installation and have sound structural performance, they are frequently used in the construction industry. However, Captain Neal warns, there is no way to tell from the exterior what kind of framing lies within a structure.

The video comes to a close as Captain Neal stresses the importance of pre-fire planning and inspections. The best way to learn what type of framing a structure has within its floors, walls and roofs is to look at the final approved framing plans. When plans are not available, finding and inspecting the places where framing is visible is the only option. Key items to look for can make inspecting for framing type easier. Floor spans between two known load bearing walls greater than about 17' will not be 2x10 or 2x12 construction and long roof clear spans will generally use trusses of some type. Wood truss construction can be easily identified by the web configuration used and the use of metal connector plates when visible.

There are an infinite number of unknown factors encountered while battling a fire. When firefighters are faced with the need to make immediate decisions on the fire ground, no outcome is more tragic than a life lost. The CSCI Fire Performance of Wood Trusses Educational Program helps making those decisions easier by creating an understanding of component installation and inspection.

SBC HOME PAGE

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