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Technical Bulletin

FROM SPEIGHT, MARSHALL & FRANCIS, P.C.

**Structural Engineers - Steel Detailers - Precast Concrete
Detailers**

July 2001

Bulletin No. XVI

On a regular basis, we plan to distribute these informational leaflets about crucial - but often ambiguous - structural engineering topics. With the knowledge of our featured subjects, our goal is to help our clients improve their profitability while reducing their liability. We suggest distributing a copy of our technical bulletins throughout your office and keeping them on hand for quick reference.



Introduction:

A high incidence of failures of wood truss systems occur during and after construction. Failure to install proper temporary and permanent truss bracing is the main reason for these failures. The bracing required to keep trusses stable during construction, insuring they perform as designed, is the most overlooked aspect of wood truss construction.

Temporary Bracing

- N **Purpose:** To hold the trusses in proper alignment during construction until permanent bracing is installed.
- N **Responsibility:** The Truss Erector. Temporary bracing should be installed in accordance with "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses" published by the Truss Plate Institute.

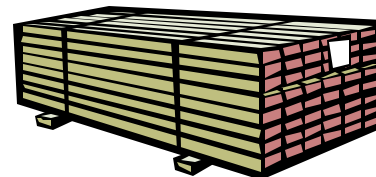
Temporary bracing must be installed as the trusses are erected, not sometime afterwards. Failure to install temporary bracing in a timely manner is the primary cause of the collapse of wood truss systems during construction.



Permanent Bracing

- N **Purpose:** To hold the trusses in proper alignment and to longitudinally brace compression web/chord bracing.
- N **Responsibility:** Structural Engineer and Truss Designer working closely together. Permanent bracing must be anchored to the other permanent structural elements which provides a key component in the overall performance of the structure.

There is a good deal of functional overlap between temporary bracing and permanent bracing. To a certain extent the same actual bracing elements can serve both functions. Some of the permanent truss bracing is provided by permanent elements not available during erection such as plywood sheathing or directly applied ceiling sheathing. Hence, separate temporary bracing may be required. Unlike temporary bracing that is anchored to the ground, permanent bracing will be anchored to the walls or other permanent elements of the building which extend up to the level of the trusses.



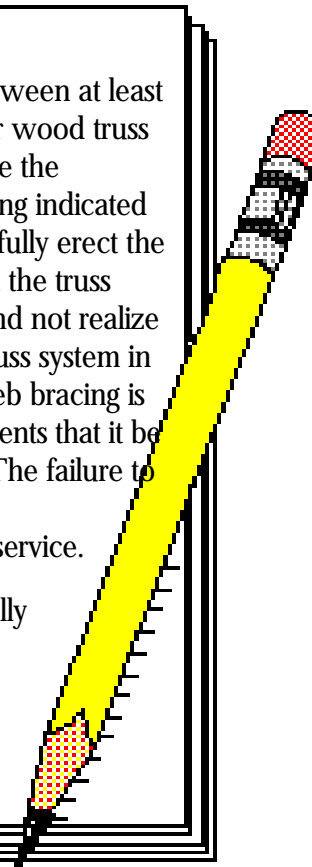
Compression Web/Chord

- N **Purpose:** To keep the slender compression elements of the truss from buckling under compression.
- N **Responsibility to specify:** Truss Designer. This bracing should be shown on the truss shop drawings. Compression bracing is fastened to the same member in each truss and is erected perpendicular to the trusses. However...compression web/chord bracing must ultimately be anchored directly to a structural element capable of resisting longitudinal loads from the brace or must itself be braced at intervals by permanent bracing. The structural engineer, not the truss designer, typically specifies the anchorage of permanent bracing required for compression web/chord bracing.

Conclusion:

Because the responsibility for designing and specifying truss bracing is spread between at least three parties, confusion often exists about the extent of truss bracing required for wood truss systems to be erected and perform properly in service. The truss erector may see the permanent bracing indicated on the structural drawings or the compression bracing indicated on the truss shop drawings and conclude that this bracing is sufficient to successfully erect the trusses. Likewise, an Architect or Engineer may see the compression bracing on the truss shop drawings as well as the temporary bracing required for the truss erection and not realize that some of the permanent bracing required for the proper functioning of the truss system in service must be designed by him/her or the structural engineer. Compression web bracing is usually clearly delineated; however, the builder may be unaware of the requirements that it be anchored or braced by other elements not shown on the truss shop drawings. The failure to communicate where these three types of bracing are required could lead to a disastrous collapse or failure either during construction or during service.

The specification of temporary and permanent bracing for wood trusses is virtually impossible to fully address on Contract Documents. Therefore, it is extremely important for all parties, both design and construction, to work closely together throughout the process to assure trusses are adequately braced. This is a controversial subject and this technical bulletin merely represents a small part of the complex overall picture.



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