Structural Building Components Association

Metal Plate Connected Wood Truss Design Process Summary

Metal plate connected wood trusses (MPCWT) are commonly used in light-frame construction. When MPCWT's are specified for the construction of a project, several different organizations and individuals will be involved in the process, from design to manufacture to installation. These include the Owner, Building Designer, Contractor, Truss Manufacturer, and Truss Designer, all defined terms as taken from the *National Design Standard for Metal Plate Connected Wood Truss Construction*, ANSI/TPI 1 ("TPI 1"). Each of these has a different responsibility in the process as set out in TPI 1, which is published by the Truss Plate Institute. TPI 1 is furthermore incorporated by reference into both the *International Building Code* (IBC) and the *Residential Building Code* (IRC).

Both the IBC and IRC require that wood trusses be designed in accordance with the provisions of the code and accepted engineering practice. Section 2303.4.1.4.1 of the IBC states:

> *Where required by the registered design professional, the building official or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.*

Similarly, Sections R502.11.1 and R802.10.2 of the IRC state:

> *The truss design drawings shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1.*

The IBC outlines the design, manufacture, and quality requirements for MPCWT in Section 2303.4 and references TPI 1 in Section 2303.4.6. The IRC includes requirements for the design and manufacture of wood trusses in Sections R502.11 and R802.10, which both reference TPI 1.

Chapter 2 of TPI 1 defines the requirements and responsibilities of the Owner, Contractor, Building Designer, Truss Manufacturer, and Truss Designer with respect to the application of trusses in the construction of a building. It is important to note that these responsibilities are prefaced by the following provision in Section 2.3 of the TPI 1 standard shown below.

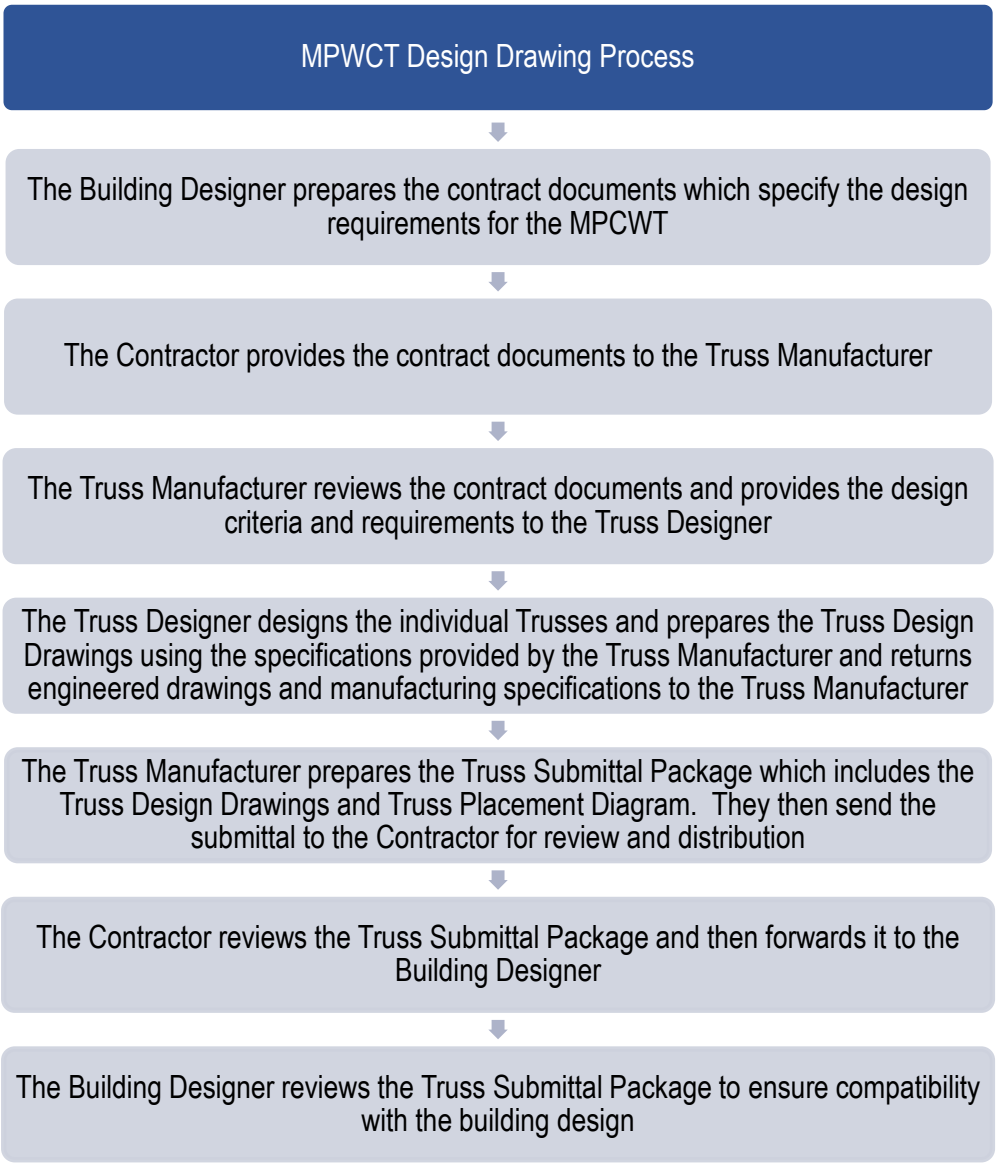
> *Where the Legal Requirements mandate a Registered Design Professional for buildings, the Building Designer and the Truss Designer shall be Registered Design Professionals.*

2701 E. Grauwyler Rd., Building 1, DPT #1026
Irving, TX 75061-3414
O: 608-274-4849 | F: 608-274-3329
sbcacomponents.com

Below is a summary of responsibilities provided in TPI 1.

- The Building Designer, who when required is a Registered Design Professional (i.e. an architect or engineer), is the individual responsible for the design of the building structural system and understands how the vertical and lateral loads are being resolved within that system. The Building Designer is responsible for preparing construction documents that provide sufficient information, including required spans and loading information, for the Truss Manufacturer and Truss Designer. The Building Designer should also review the Truss Submittal Package for compatibility with the building design. This includes a review of the truss design and criteria used by the Truss Designer.
- The Contractor is responsible for providing the Truss Manufacturer with all pertinent construction document information and that information in turn is provided by the Truss Manufacturer to the Truss Designer, who in turn is responsible for the preparation of the Truss Design Drawings.
- The Truss Manufacturer is responsible for reviewing the contract documents so that they can provide design parameters to the Truss Designer. These parameters are often communicated to the Truss Designer electronically using proprietary software. Where and/or when required, the Truss Manufacturer will also prepare the Truss Placement Diagram which is intended to graphically represent the location of the individual truss members to assist with truss installation in the field. Finally, the Truss Manufacturer will compile the Truss Submittal Packet, which will include the Truss Design Drawings from the Truss Designer and the Truss Placement Diagram, and then submit them to the Contractor for review and distribution. It should be noted that this work performed by the Truss Manufacturer is typically done by a truss technician, not a Truss Designer or Registered Design Professional.
- The Truss Designer is responsible for the design of the individual truss members and preparation of the Truss Design Drawings. The Truss Designer will review the truss design criteria and design requirements provided by the Truss Manufacturer to design the trusses. Most MPCWT's are designed with the assistance of proprietary software.

In context of these responsibilities, the process of developing and approving MPCWT design drawings becomes clearer. Below is a graphical representation of the process.



It is important to understand that the Truss Designer's responsibility is limited to the design of the individual truss members, and not either the roof system or floor system. It is important that the Building Designer reviews the Truss Submittal Package to ensure it conforms to their design intent. Additionally, the Truss Designer is not usually an employee of the Truss Manufacturer. The Truss Manufacturer will typically employ a truss technician who is responsible for reviewing the contract documents and providing design criteria and requirements to the Truss Designer. The truss technician is typically not a Registered Design Professional and is not performing design services. The primary function of the truss technician is to convey the truss specifications as supplied by the Building Designer to the Truss Designer who is often employed by the Metal Plate Connector supplier and is a registered Design Professional.

The process to develop drawings for MPCWT for use in light-frame construction involves individuals from multiple different organizations. These relationships have been carefully drafted and documented in the codes and reference standard to ensure that the process conforms with industry practices and is in compliance with regulatory requirements. Following this process is important to ensure the MPCWT delegated design process is conducted in a manner that provides a clear, transparent, and documented Truss Submittal Packet for the Building Designer to review.