

by Larry Wainright

One of the most recurrent technical questions in the industry is explained.

Beginning with the May 2001 *SBC Magazine*, the issue of sealing a truss placement diagram (TPD) has been the topic of numerous articles. Searching on the words “truss placement” at www.sbcmag.info, you find over a dozen articles including features in June 2002, April 2007 and August 2007. Additionally, over half of the *SBC Tech Notes* (www.sbcindustry.com/technotes.php) written to clarify code issues and help educate the marketplace on structural building component topics are dedicated to “Seals and Truss Placement Diagrams.” Yet despite all the information available, we still receive numerous questions as to why a TPD should not be sealed.

Question

I have submitted my construction documents along with the truss design drawings and the truss placement diagram to my local building official with my application for a building permit for a single family residence. The building official wants an engineer’s seal on the TPD. The truss manufacturer told me that this is not a good idea. Can the truss placement diagram be sealed and if not, why?

Answer

The answer to this question depends on a number of circumstances such as professional engineering laws in the state, the building code in force, any local statutes that may be enforced, or the presence of a registered design professional (RDP) on the project.

The majority of residential structures in the United States are built using the prescriptive code of the *2006 International Residential Code (IRC)*. Trusses are simply replacements for the prescriptively applied joists and rafters, and are highly engineered structural elements.

When the building designer involved with a residential project is a RDP, he must evaluate the structural components (e.g., rafters, joists, I-joists, and trusses) to ensure their adequacy for the project. The placement of trusses is just one of the elements the RDP must consider. Whether or not required by the statutes of the jurisdiction where the project is located, the RDP may effectively delegate the design of the trusses to a truss design engineer. The RDP will then review and approve all engineering performed by the truss design engineer.

In preparing the construction documents, the building designer needs to provide the truss design engineer with the information necessary to properly design the trusses for the building. According to *ANSI/TPI 1-2002 Chapter 2*, which is adopted by reference in *2006 IRC*, the following information must be provided:

ANSI/TPI 1-2002 Chapter 2

2.5.2 The Building Designer...shall provide the following:

2.5.2.1 All Structural Element and Truss orientations and locations;

2.5.2.2 Information to fully determine all Truss profiles;

2.5.2.3 All Structural Element and Truss bearing conditions;

2.5.2.4 The location, direction, and magnitude of all dead and live loads applicable to each Structural Element and Truss...

2.5.2.5 All Structural Element and Truss anchorage designs required to resist uplift, gravity, and lateral loads;

at a glance

- ❑ Truss placement diagrams (TPD) are intended to assist in positioning trusses and related components supplied by the component manufacturer.
- ❑ On residential projects, the truss design engineer is responsible for the single truss design depicted on each truss design drawing.
- ❑ Since the TPD is not typically prepared under the truss designer engineer’s supervision, it is not considered an engineered document.
- ❑ It is not legal in most states for a truss design engineer to seal a non-registered person’s work for which he has no direct supervision.

- 2.5.2.6 Allowable vertical and horizontal deflection criteria and any specific criteria...
- 2.5.2.7 Proper transfer of design loads affecting the Structural Elements and Trusses;
- 2.5.2.8 Adequate connections between Trusses and between Structural Elements...but not Truss to Truss girder connections...
- 2.5.2.9 Permanent bracing design for the Building...and permanent bracing for all Structural Elements and Trusses...

2.5.3 The Building Designer shall be responsible for the adequacy of the design of the Building Structural System [and]...shall evaluate the effect of the Trusses and the Structural Elements supplied, on the Building Structural System.

Assuming the requisite information is provided within the construction documents issued by the RDP or building designer, the truss design engineer's sole responsibility is to properly design the individual trusses according to this information. Once designed, a truss is then depicted on a truss design drawing. The truss design engineer is therefore specifically responsible for the single truss design depicted on each truss design drawing.

Conversely, the TPD is prepared by component manufacturer personnel. These individuals are not typically truss design engineers; they can be the truss manufacturer's salespeople, truss technicians or truss take-off specialists. Although these people are usually highly trained and skilled in their work, they are generally non-engineers. Because the TPD is typically prepared outside the truss designer engineer's scope of work, these diagrams may not be reviewed or even seen by the truss design engineer and are therefore not prepared under the truss design engineer's direct supervision.

Because a TPD is generally neither created by nor created under the immediate personal supervision of a licensed design professional, they cannot be sealed. For a truss design engineer to seal a non-registered person's work for which he has no direct supervision violates engineering law in most states.

TPDs are intended to assist customers, erectors and code enforcement officials in positioning or locating the trusses and related structural components supplied by the component manufacturer. Their function is to serve as detailed installation instructions. They indicate the component manufacturer's assumed location for each truss or related component that has been designed and manufactured according to the information on the construction documents. From this perspective, a truss or related structural building component is no different than a window that is manufactured and in turn installed within a building. A window may be a highly engineered component of a house with specific installation specifications and instructions; however, there is no requirement to provide an engineer's seal on the installation instructions for windows.

While the IRC remains relatively silent on the issue, the IBC has recognized the confusion and the 2006 IBC has been revised to

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include this language regarding truss placement diagrams:

2303.4.1.3 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall not be required to bear the seal or signature of the truss designer.

Exception: When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.

Since the TPD is not normally prepared under the supervision of the RDP, they are not required to be sealed. It should also be noted that this exception was removed from the 2009 IBC to further clarify that the TPD is not an engineered document and therefore should not require an engineer's seal. **SBC**

For further information:

- www.sbcindustry.com/technotes.php
- www.sbcindustry.com/ttbplacewww.sbcmag.info/Archive/2007/aug/0708_sealingtpd.pdf
- www.sbcmag.info/Archive/2007/apr/0704_hill.pdf
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