



Research Report

Position Statement on Sealed Truss Placement Diagrams for the State of Texas

SRR No. 1601-05

Structural Building Components Association (SBCA)

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This research report is based on practical scientific research (literature review, testing, analysis, etc.), with the goal of supporting strategic needs for code and standards development and market expansion. This research report complies with the following sections of the building code:

- [IBC Section 104.11.1](#) and [Section 1703.4.2](#) – "**Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved sources*."
- [IBC Section 202](#) – "**APPROVED SOURCE.** An independent person, firm or corporation, *approved* by the *building official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses."

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Introduction:

It can be often misunderstood whether a Truss Design Engineer has the responsibility to seal a Truss Placement Diagram (TPD). The purpose of this research report is to provide the relevant code sections from the latest editions of the International Building Code (*IBC*) for thorough analysis and interpretation. Although currently the state of Texas has adopted the 2006 *IBC*, different Jurisdictions have adopted more recent editions. For instance, the city of Schertz, Texas has adopted the 2012 *IBC* through [Ordinance No. 15-C-20](#). To be clear, the TPD is not to be viewed as an engineering document except as stated below in our analysis. Rather, it is provided to assist the installer in properly locating the trusses within the structure. All the necessary truss engineering and analysis is found on the Truss Design Drawings (TDD).

If a TPD is provided, it is recommended that the Building Designer review and approve the TPD to ensure that the intended load paths have not been altered (see [2012 IBC Section 1604.4](#) or [2015 IBC Section 1604.4](#)). If a Truss Design Engineer were to seal a TPD, it has been suggested that they could inappropriately be held responsible for ensuring the proper flow of loads through the truss to the bearing and support structure below the truss and into the foundation. A Truss Design Engineer would only undertake Building Designer responsibilities under a special set of circumstances, including that he/she is professionally capable of taking on such responsibility and that he/she are properly compensated for the work.

The Truss Design Engineer is not the Building Designer and cannot be construed as such since this is completely outside of their defined scope of work. Texas professional engineering laws and regulations are clear with respect to declaring the specific scope of work being performed by each engineer on a project. A Truss Design Engineer could only undertake Building Designer responsibilities under a special set of circumstances and when they are delegated the appropriate scope of work as a Successor Engineer. This would require authorization from the owner of the project and a contract to do so, along with being professionally capable of taking on such responsibility and being compensated for doing so.

Key Definitions:

Definitions related to trusses – not specifically defined in the International Building Code but defined in *ANSI/TPI 1 (TPI 1)* by building code reference to *TPI 1*:

TRUSS PLACEMENT DIAGRAM (TPD) – The illustration supplied by the Truss Manufacturer identifying the location assumed for each Truss, and which references each individually designated Truss Design Drawing (see 2012 *IBC* [Section 2303.4.2](#) or 2015 *IBC* [Section 2303.4.2](#))

Definitions Included in the *IBC*:

CONSTRUCTION DOCUMENTS – Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit. (2012 *IBC* [Chapter 2](#) or 2015 *IBC* [Chapter 2](#))

REGISTERED DESIGN PROFESSIONAL (RDP) – An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed. (2012 *IBC* [Chapter 2](#) or 2015 *IBC* [Chapter 2](#))

TRUSS DESIGN DRAWING (TDD) – The graphic depiction of an individual truss, which describes the design and physical characteristics of the truss (see 2012 *IBC* [Section 2303.4.1](#) or 2015 *IBC* [Section 2303.4.1](#))

TRUSS DESIGNER – The individual or organization responsible for the design of trusses (see *IBC* 2012 [Section 2303.4.1.4](#) or *IBC* 2015 [Section 2303.4.1.4](#))

Unique Definitions for Structures that require a RDP (*TPI 1-2007*):

REGISTERED DESIGN PROFESSIONAL – The Owner of the Building contracts with a Registered Design Professional for the design of the Building Structural System and who is responsible for the Construction Documents.¹

TRUSS DESIGN ENGINEER – The individual or organization responsible for the design of Trusses. Each individual truss design drawing shall bear the seal and signature of the Truss Design Engineer.²

¹ Adapted from [2015 IBC Section 107.1](#)

² Adapted from [2015 IBC Section 2303.4.1.4](#)

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Unique Definitions for Structures that do not require a RDP (TPI 1-2007):

BUILDING DESIGNER – The Owner of the Building or the individual or organization that contracts with the Owner for the design of the Building Structural System and/or who produces the Construction Documents.³

TRUSS DESIGNER – The individual or organization responsible for the design of trusses.⁴

Unique Definitions for Structures that require a RDP (TPI 1-2014):

BUILDING DESIGNER – Owner of the Building or the Person that contracts with the Owner for the design of the Building Structural System and/or who is responsible for the preparation of the Construction Documents. When mandated by the Legal Requirements, the Building Designer shall be a Registered Design Professional.

REGISTERED DESIGN PROFESSIONAL – Architect or engineer, who is licensed to practice their respective design profession as defined by the Legal Requirements of the Jurisdiction in which the Building is to be constructed.⁵

TRUSS DESIGNER – Person responsible for the preparation of the Truss Design Drawings.⁶

Other Pertinent Definitions:

DELEGATED ENGINEER⁷ – An engineer who undertakes a specialty service and provides services or creative work (delegated engineering document) regarding a portion of the engineering project. The delegated engineer is the engineer of record for that portion of the engineering project.

DIRECT SUPERVISION⁸ – The control over and detailed professional knowledge of the work prepared under the engineer's supervision. The degree of control should be such that the engineer personally makes engineering decisions or personally reviews and approves proposed decisions prior to their implementation. The engineer must have control over the decisions either through physical presence or the use of communications devices.

SPECIALTY ENGINEER⁹ – An engineer, who is not the structural engineer of record, who provides engineering criteria or designs necessary for the structure to be completed. The specialty engineer may be a delegated engineer.

SUCCESSOR ENGINEER¹⁰ – An engineer seeking to reuse already sealed contract documents under the successor professional engineer's seal must be able to document and produce upon request evidence that he has in fact recreated all the work done by the original professional engineer. The successor professional engineer must take all professional and legal responsibility for the documents which he sealed and signed and can in no way exempt himself from such full responsibility. Plans need not be redrawn by the successor professional engineer; however, justification for such action must be available through well-kept and complete documentation on the part of the successor professional engineer as to his having rethought and reworked the entire design process.

TRUSS SYSTEM ENGINEER¹¹ – An engineer who designs a Truss System.

Background:

Certain jurisdictions are requesting engineering seals to be placed on TPDs (also known as a truss placement plan, truss layout, framing plan or framing layout). The following information is intended to provide insight into Texas professional engineering law and the building code, and the ramifications of providing seals on TPD for projects governed by the [2012 IBC](#) or [2015 IBC](#).

The code language regarding Truss Placement Diagrams in the 2012 *IBC* and 2015 *IBC* was introduced in the 2006 *IBC* code change process (S165-04/05). The original code change proposal only included a definition of a TPD:

2303.4.2 Truss placement diagrams. Diagrams supplied by the truss manufacturer that identify the individually designated truss design drawings do not require the seal of a truss design engineer.

The following rationale for this addition to the code in S165-04/05 was submitted:

³ Adapted from [2015 IBC Section 107.1](#)

⁴ Adapted from [2015 IBC Section 2303.4.1.4](#)

⁷ Definition from Florida Administrative Code Rule [61G15-30.002](#) Definitions: Delegated Engineer

⁸ Definition from [Texas Engineering Practice Act and Rules](#) SUBCHAPTER F: ADMINISTRATION §131.81 Definitions

⁹ Definition from Florida Administrative Code Rule [61G15-31.002](#) Definitions: Specialty Engineer

¹⁰ Definition from Florida Administrative Code Rule [61G15-31.001](#) Procedures for a Successor Professional Engineer Adopting As His Own the Work of Another Engineer

¹¹ Definition from Florida Administrative Code Rule [61G15-31.003](#) Design of Structures Utilizing Prefabricated Wood Trusses: Truss System Engineer

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The intent of adding a definition of the term 'truss placement diagram' is to minimize the confusion that exists in the construction industry between a variety of terms that can mean the same thing, such as "construction documents", "shop drawings," etc. The term 'truss placement diagram' has been used by the truss industry and is very specific. This change, along with the clarification of the term 'truss design drawing,' will provide for much greater clarity and easier communication.

The original submission of a definition for a TPD was modified during the hearing process. The modification resulted in the code language in the [2006 IBC Section 2303.4.2](#), however, the rationale for this modified code change was not revised.

2303.4.3 Truss Placement Diagram. A diagram supplied by the truss manufacturer 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 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.

In the 2009 IBC, the truss section was reorganized ([ICC Public Hearing S66-06/07](#)). The requirement regarding TPD was revised as well ([ICC Public Hearing S217-07/08](#)) as proposed by the National Council of Structural Engineers Associations (NCSEA). This revised language accepted for the [2009 IBC Section 2303.4.2](#) is also included in the [2012 IBC Section 2303.4.2](#) and the [2015 IBC Section 2303.4.2](#).

2303.4.2 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies 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 that serve only as a guide for installation and do not deviate from the permit submittal drawings shall not be required to bear the seal or signature of the truss designer.

The rationale for the change proposed by [ICC Public Hearing S217-07/08](#) is as follows:

The truss placement diagram is an erection diagram that replicates the information on the approved construction documents per Section 106.3. As it requires no engineering input, direct supervision and the signature and seal of a registered design professional is not required.

The Commentary to the [2012 IBC Section 2303.4.2](#) confirms the original intent of the code change.

This section describes and defines the term "truss placement diagram." It is intended to minimize the confusion that exists in the construction industry between a variety of terms that are often used interchangeably, such as "installation documents," "construction documents," "shop drawings," etc. The term "truss placement diagram" is preferred by the truss industry and is very specific. The section requires a truss placement diagram to identify the location of each truss and references the corresponding truss design drawing to facilitate inspection and proper installation.

Analysis:

International Building Code

The [2012 IBC Section 2303.4](#) and [2015 IBC Section 2303.4](#) include the following relevant sections that lay out the differences between TDDs and TPDs:

2303.4.1.4.1 Truss design drawings. 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.

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2303.4.2 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 that serve only as a guide for installation and do not deviate from the *permit* submittal drawings shall not be required to bear the seal or signature of the truss designer.

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2303.4.3 Truss submittal package. The truss submittal package provided by the truss manufacturer shall consist of each individual truss design drawing, the truss placement diagram, the permanent individual truss member restraint/bracing method and details and any other structural details germane to the trusses; and, as applicable, the cover/truss index sheet.

The [2012 IBC Section 107](#) and [2015 IBC Section 107](#) provide that the plans and specifications for a project shall be prepared by a licensed architect or engineer where required by the law of the jurisdiction in which the project is being constructed. In particular, both state:

107.1 General. Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data shall be submitted in two or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

The plans and specifications should in turn clearly define the scope of the work proposed by the Building Designer:

107.2.1 Information on construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted where approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

Statutes for Professional Engineering

Texas' professional engineering laws and the *IBC* provide the basis upon which to evaluate the need to provide an engineer's seal on a TPD.

Requiring the TPD to be sealed, where it is not prepared by an engineer or under his/her immediate personal supervision, is contrary to [Texas Engineering Practice Act and Rules](#) which includes language regarding sealing construction documents:

§137.33 Sealing Procedures (a) The purpose of the engineer's seal is to assure the user of the engineering product that the work has been performed or directly supervised by the professional engineer named and to delineate the scope of the engineer's work.

(b) License holders shall only seal work done by them, performed under their direct supervision as defined in §131.81¹² of this title, relating to Definitions, or shall be standards or general guideline specifications that they have reviewed and selected. Upon sealing, engineers take full professional responsibility for that work.

Based on the above, a TPD does not require a professional engineer's seal for any building project in the state of Texas.

ANSI/TPI 1¹³

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 *TPI 1-2007*, which is referenced by 2012 *IBC* and *TPI 1-2014*, which is referenced by the 2015 *IBC*.

TPI 1-2007 includes the following regarding the use of a TPD in Chapter 2, related to the two conditions listed in Section 2.3 and Section 2.4:

Truss Placement Diagram: Illustration identifying the assumed location of each Truss.

2.3 RESPONSIBILITIES WHERE THE LEGAL REQUIREMENTS MANDATE A REGISTERED DESIGN PROFESSIONAL FOR BUILDINGS

2.3.5.4 Truss Placement Diagram. When the Truss Placement Diagram serves only as a guide for Truss installation, it does not require the seal of the Truss Design Engineer.

2.3.6.4 Truss Placement Diagram. Where required by the Construction Documents or Contract, the Truss Manufacturer shall prepare the Truss Placement Diagram that identifies the assumed location for each individually designated Truss and references the corresponding Truss Design Drawing. The Truss Placement Diagram shall be permitted to include identifying marks for other products including Structural Elements, so that they may be more easily identified by the Contractor during field erection. When

¹² See KEY DEFINITIONS section of this SRR

¹³<http://www.tpinst.org/>

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the Truss Placement Diagram serves only as a guide for Truss installation and requires no engineering input, it does not require the seal of any Truss Design Engineer or Registered Design Professional.

2.3.6.5 Required Documents. The Truss Manufacturer shall supply to the Contractor the Truss Submittal Package, including the Truss Design Drawings sealed by a Truss Design Engineer, a Truss Placement Diagram, if required by the Construction Documents or Contract, and the required Permanent Individual Truss Member Restraint and the method to be used per Section 2.3.3.

2.4 RESPONSIBILITIES WHERE THE LEGAL REQUIREMENTS DO NOT MANDATE A REGISTERED DESIGN PROFESSIONAL FOR BUILDINGS

2.4.5.3 Truss Placement Diagram. When the Truss Placement Diagram serves only as a guide for Truss installation, it does not require the seal of the Truss Design Engineer.

2.4.6.4 Truss Placement Diagram. Where required by the Construction Documents or Contract, the Truss Manufacturer shall prepare the Truss Placement Diagram that identifies the assumed location for each individually designated Truss and references the corresponding Truss Design Drawing. The Truss Placement Diagram shall be permitted to include identifying marks for other products including Structural Elements, so that they may be more easily identified by the Contractor during field erection.

2.4.6.5 Required Documents. The Truss Manufacturer shall supply to the Contractor the Truss Submittal Package, including the Truss Design Drawings, a Truss Placement Diagram, if required by the Construction Documents or Contract, and the required Permanent Individual Truss Member Restraint and the method to be used per Section 2.4.3.

TPI 1-2014 includes the following regarding the use of a TPD in Chapter 2:

Truss Placement Diagram: Illustration identifying the assumed location of each Truss.

2.3.5 Requirements of the Truss Designer

2.3.5.4 Truss Placement Diagram. When the Truss Placement Diagram serves only as a guide for Truss installation, it does not require the seal of the Truss Designer (Truss Design Engineer).

2.3.6.4 Truss Placement Diagram. Where required by the Construction Documents or Contract, the Truss Manufacturer shall prepare the Truss Placement Diagram that identifies the assumed location for each individually designated Truss and references the corresponding Truss Design Drawing. The Truss Placement Diagram shall be permitted to include identifying marks for other products including Structural Elements, so that they may be more easily identified by the Contractor during field erection. When the Truss Placement Diagram serves only as a guide for Truss installation and requires no engineering input, it does not require the seal of any Registered Design Professional including in cases where the legal requirements mandate a Registered Design Professional for buildings.

2.3.6.5 Required Documents. The Truss Manufacturer shall supply to the Contractor the Truss Submittal Package, including the Truss Design Drawings, a Truss Placement Diagram, if required by the Construction Documents or Contract, and the required Permanent Individual Truss Member Restraint and the method to be used per Section 2.3.3.

The Commentary to *TPI 1-2014* Section 2.1 includes the rationale for the change:

The 2007 edition of the Standard used the language from Appendix A of ANSI/TPI 1-2002 and language in the International Building Code (IBC) and/or International Residential Code (IRC) as its basis. Chapter 2 of the 2007 edition contained two distinct sections: one for Buildings when a Registered Design Professional (RDP) as the Building Designer is required and one when a RDP as the Building Designer is not required. Responsibilities under these two conditions are different and it was important to clarify them in the standard. As a result of having these two sections, the term Truss Design Engineer (one licensed to practice engineering) was used to define the one responsible for the design of the Trusses when a RDP is required and the term Truss Designer was used to define the one responsible for the design of the Trusses when a RDP is not required.

Having the two separate but similar sections in the 2007 edition of the Standard (Section 2.3 for when a Design Professional is required and Section 2.4 for when a Design Professional is not required) created some confusion and possible mis-use of the 2007 edition likely due to the redundant language in the two sections. In an attempt to further clarify the Standard and to remove redundant language, the 2014 edition of the Standard combined Sections 2.3 and 2.4. In doing so, the terms "Registered Design Professional for the Building" and "Truss Design Engineer" were removed and replaced with the more generic terms "Building Designer" and "Truss Designer" respectively. Depending on the job and the statutes of the jurisdiction in which the project is to be constructed, these individuals (or entities) may or may not be required to be Registered Design Professionals. The Standard now accommodates this by prefacing the Design Responsibilities section with a provision that says, "Where the Legal Requirements mandate a Registered Design Professional for buildings, the Building Designer and the Truss Designer shall be Registered Design Professionals."

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What are the Assumptions and Legal Requirements of Truss Design and Preparation of Truss Design Drawings?

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 TDD. The Truss Design Engineer is therefore specifically responsible for the single truss design depicted on each TDD.

Who Typically Prepares Truss Placement Diagrams?

Assuming the requisite information is provided in the construction documents, TPDs are prepared by component manufacturer personnel who are typically not professional engineers. The individuals preparing TPD are trained individuals who work as truss technicians, truss take-off specialists or truss salespeople. As TPD are typically prepared outside a Truss Design Engineer's scope of work, they may not be reviewed or even seen by the Truss Design Engineer. TPDs are generally not prepared within the typical duties of the Truss Design Engineer and are therefore not prepared under the Truss Design Engineer's direct supervision.

To Require Truss Placement Diagrams to be Sealed Would Violate Texas State Engineering Law.

Because TPD are generally neither created by nor created under the immediate direct supervision of a licensed design professional, they cannot be sealed. Requesting a Truss Design Engineer to seal a non-registered person's work is illegal in Texas according to the [Texas Engineering Practice Act and Rules](#) which state in pertinent part:

§ 1001.401. Use of Seal (a) On receiving a license, a license holder shall obtain a seal in a design authorized by the board, showing the license holder's name and the legend "Licensed Professional Engineer" or "Registered Professional Engineer."

RULE §137.33 Sealing Procedures. (a) The purpose of the engineer's seal is to assure the user of the engineering product that the work has been performed or directly supervised by the professional engineer named and to delineate the scope of the engineer's work.

(b) License holders shall only seal work done by them, performed under their direct supervision... Upon sealing, engineers take full professional responsibility for that work. ...

Why are Truss Placement Diagrams Prepared?

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 truss orientation, setting, or placement instructions. They indicate the component manufacturer's assumed location for each truss or related component that has been designed and manufactured.

For example, 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.

Ultimately, the Building's Designer is the best person to review and ascertain whether the load paths that they contemplated in the design process are achieved.

Findings:

The [2012 IBC Section 2303.4.2](#) and [2015 IBC Section 2303.4.2](#) both specify that a TPD does not require the seal of the Truss Design Engineer when the TPD serves only as a guide for installers. It is the responsibility of the Building Designer to review the TPD, if provided, and verify that it does not deviate from the permit submittal documents.

Conclusion

Truss Design Engineers should not be asked by RDPs, Building Designers or Building Code Officials to seal TPDs.

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References and Substantiating Data:

Please review all footnotes in this document as they provide direct references that apply to a given statement. These are intended to provide context for good decision making.

ANSI/TPI, National Design Standard for Metal Plate Connected Wood Truss Construction, Truss Plate Institute, 2007

International Building Code, International Code Council, 2006, 2009, 2012, 2015

Texas Engineering Practice Act and Rules Concerning the Practice of Engineering and Professional Engineering Licensure, Texas Board of Professional Engineers, 2015

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