



# Research Report

## What Should Constitute a Truss Submittal Package and a Jobsite Package?

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Structural Building Components Association

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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:

In order to promote the safe installation of building components including trusses, manufacturers send out a Jobsite Package to the construction site with the truss delivery. These Jobsite Packages include the Truss Submittal Package. The Truss Submittal Package includes the information that if required will be submitted to the Contractor/Building Designer, who if required will submit it to the local building official.

A primary purpose of the Structural Building Components Association (SBCA) is to promote industry best practices that enhance product application knowledge and foster improved jobsite safety. In order to facilitate code compliance and job site safety, it is in the best interest of all parties dealing with structural building components to use standardized information, as applicable, which can be provided with each truss delivery, in the Jobsite Package.

### Key Definitions

From ANSI/TPI 1 Chapter 2:

**BCSI** - *Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses* jointly produced by the Structural Building Components Association (SBCA) and the Truss Plate Institute (TPI).

**BCSI-B1** - *Guide for Handling, Installing, Restraining & Bracing of Trusses* of the Building Component Safety Information (BCSI).

**BCSI-B2** - *Truss Installation and Temporary Restraint/Bracing* of the Building Component Safety Information (BCSI).

**BCSI-B3** - *Permanent Restraint/Bracing of Chords and Web Members* of the Building Component Safety Information (BCSI).

**BCSI-B7** - *Guide for Handling, Installing & Bracing of 3x2 and 4x2 Parallel Chord Trusses* of the Building Component Safety Information (BCSI).

**BCSI-B10** - *Post Frame Truss Installation & Temporary Restraint & Bracing* of the Building Component Safety Information (BCSI).

**BCSI-B11** - *Fall Protection & Trusses* of the Building Component Safety Information (BCSI).

**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.

**Building Official** - Officer or other designated authority charged with the administration and enforcement of the Building Code, or a duly authorized representative.

**Construction Documents** - Written, graphic and pictorial documents prepared or assembled for describing the design, (including the Framing Structural System), location and physical characteristics of the elements of a Building necessary to obtain a Building Permit and construct a Building. Where required by the statutes of the jurisdiction in which the project is to be constructed, the Construction Documents or parts of the Construction Documents, shall be prepared by a Registered Design Professional.

**Contractor** - Owner of a building, or the person who contracts with the Owner, who constructs the building in accordance with the Construction Documents and the Truss Submittal Package. The term "Contractor" shall include those subcontractors who have a direct contract with the Contractor to construct all or a portion of the construction.

**Cover/Truss Index Sheet** - Sheet that is signed and sealed, where required by the legal requirements, by the Truss Designer, and depending on the legal requirements shall be permitted to contain the following information: (1) identification of the building, including building name and address, lot, block, subdivision, and city or county; (2) identification of Construction Documents by drawing number(s) with revision date; (3) specified building code; (4) computer program used; (5) roof dead and live loads; (6) floor dead and live loads; (7) wind load criteria from a specifically defined code (e.g., ASCE 7) and any other design loads (such as ponding, mechanical loads, etc.); (8) name, address and license number of Building Designer, if known; (9) a listing of the individual identification numbers and dates of each Truss Design Drawing referenced by the Cover/Truss Index Sheet; and (10) name, address, date of Cover/Truss Index Sheet and license number of Truss Designer

**Diagonal Bracing** - Within a Truss system, structural member(s) installed along a portion of a Top Chord, Bottom Chord, or Web plane, at approximately 45 degrees to a Lateral Restraint member to provide a load path for the Lateral Restraint (See *BCSI-B1*, *BCSI-B2*, *BCSI-B3*, *BCSI-B7*, and *BCSI-B10*).

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**Jobsite Package** - The Jobsite package is a package containing pertinent information sent to the job site to promote the safe installation of the structural building components.

**Lateral Restraint** - Also known as continuous lateral brace or CLB. A structural member installed at right angles to a chord or web member of a truss to reduce the laterally unsupported length of the truss member (See *BCSI-B1*, *BCSI-B2*, *BCSI-B3*, *BCSI-B7*, and *BCSI-B10*).

**Owner** - Person having a legal or equitable interest in the property upon which a Building is to be constructed, and: (1) either prepares, or retains the Building Designer or Registered Design Professional to prepare the Construction Documents; and (2) either constructs, or retains the Contractor to construct the Building.

**Permanent Individual Truss Member Restraint** - Restraint that is used to prevent local buckling of an individual Truss chord or Web member due to the axial forces in the individual Truss member (See *BCSI-B2* and *BCSI-B3*).

**Registered Design Professional** - Architect or engineer, who is licensed to practice their respective design profession as defined by the legal requirements of jurisdiction in which the project is to be constructed.

**Truss Design Drawing** - Written, graphic and pictorial depiction of an individual truss that includes the information required in Sections 2.3.5.5

**Truss Designer** - Person responsible for the preparation of the Truss Design Drawings.

**Truss Manufacturer** - Person engaged in the fabrication of trusses.

**Truss Placement Diagram** - Illustration identifying the assumed location of each truss.

**Truss Submittal Package** - Package consisting of each individual Truss Design Drawing, and, as applicable, the Truss Placement Diagram, the Cover/Truss Index Sheet, Lateral Restraint and Diagonal Bracing details designed in accordance with generally accepted engineering practice, applicable *BCSI* -defined Lateral Restraint and Diagonal Bracing details, and any other structural details germane to the trusses.

**Structural Building Components** - Specialized structural building products designed, engineered and manufactured under controlled conditions for a specific application. They are incorporated into the overall building structural system by the Building Designer. Examples are roof trusses, floor trusses, floor panels, wall panels, I-joists, beams, headers, lintels, structural sheathing, columns, etc.

### Background:

The 2009, 2012 and 2015 *IBC* include code requirements regarding Truss Submittal Packages as follows:

#### Chapter 23 WOOD

**2303.4.1.1 Truss design drawings.** The written, graphic and pictorial depiction of each individual truss shall be provided to the *building official* for approval prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site.

**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. ...

#### **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.

#### SECTION 2211 COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION

**2211.3.1 Truss design drawings.** The truss design drawings shall conform to the requirements of Section B2.3 of AISI S214 and shall be provided with the shipment of trusses delivered to the job site. The truss design drawings shall include the details of permanent individual truss member restraint/bracing in accordance with Section B6(a) or B 6(c) of AISI S214 where these methods are utilized to provide restraint/bracing.

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The 2009, 2012 and 2015 *IRC* include code requirements regarding truss submittals as follows:

**R502.11.1 Design.** Wood trusses shall be designed in accordance with *approved* engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional where required by the statutes of the *jurisdiction* in which the project is to be constructed in accordance with Section R106.1.

**R502.11.4 Truss design drawings.** Truss design drawings, prepared in compliance with Section R502.11.1, shall be submitted to the *building official* and *approved* prior to installation. Truss design drawings shall be provided with the shipment of trusses delivered to the job site. ...

**R802.10.1 Truss design drawings.** Truss design drawings, prepared in conformance to Section R802.10.1, shall be provided to the *building official* and *approved* prior to installation. Truss design drawings shall be provided with the shipment of trusses delivered to the job site. ...

**R802.10.2 Design.** Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional where required by the statutes of the *jurisdiction* in which the project is to be constructed in accordance with Section R106.1.

The 2009, 2012 and 2015 *IRC* include code requirements regarding truss bracing as follows:

**R106.1.2 Manufacturer's installation instructions.**

Manufacturer's installation instructions, as required by this code, shall be available on the job site at the time of inspection.

**R502.11.2 Bracing.**

Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the construction documents for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, the SBCA *Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses*.

**R802.10.3 Bracing.**

Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the construction documents for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practice such as the SBCA *Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses*.

The minimum standard to which metal plated connected wood trusses are to be designed and manufactured in the United States is *ANSI/TPI 1-2014*. *ANSI/TPI 1-2014* is the latest edition and is referenced by the 2015 *IBC* and *IRC*, *ANSI/TPI 1 2007* is referenced by the 2009, 2012 *IBC* and *IRC*. *ANSI/TPI 1* both establishes minimum requirements for the design and construction of metal plate connected wood trusses, and defines the accepted responsibilities for all parties involved in the design and application of metal plate connected wood trusses (Chapter 2). One of the Truss Manufacturer's responsibilities is to supply the Truss Submittal Package to the contractor which is defined by *ANSI/TPI-1-2014*.

**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 location and the method to be used per Section 2.3.3

**2.3.3 Requirements for the Permanent Member Restraint/Bracing of Truss Systems.**

**2.3.3.1 Method of Restraint.** The method of Permanent Individual Truss Member Restraint/Bracing and the method of anchoring or restraining to prevent lateral movement of all Truss members acting together as a system shall be accomplished by:

**2.3.3.1.1 Standard Industry Details.** Standard industry Lateral Restraint and Diagonal Bracing details in accordance with *BCSI-B3: Permanent Restraint/Bracing of Chords & Web Members* and/or *BCSI-B7: Temporary & Permanent Restraint/Bracing for Parallel Chord Trusses* of the Building Component Safety Information (*BCSI*).

**2.3.3.1.2 Substitution with Reinforcement.** Permanent Individual Truss Member Restraint shall be permitted to be replaced with reinforcement designed to prevent buckling (e.g., buckling reinforcement by T-reinforcement or L-reinforcement, proprietary reinforcement, etc.).

**2.3.3.1.3 Project Specific Design.** A project specific Truss member permanent Lateral Restraint/bracing design for the roof or floor Framing Structural System shall be permitted to be specified by the Building Designer or any Registered Design Professional.

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**2.3.3.2 Absence of Truss Restraint/Bracing Method or Details.** If a specific Truss member permanent bracing design for the roof or floor Framing Structural System is not provided by the Owner, Building Designer or any Registered Design Professional, the method of Permanent Individual Truss Member Restraint and Diagonal Bracing for the Truss Top Chord, Bottom Chord, and Web members shall be in accordance with *BCSI-B3* or *BCSI-B7*.

**2.3.3.3 Trusses Spanning 60 Feet (18 m) or Greater.** For Trusses with clear spans 60 ft. (18 m) or greater, see Section 2.3.1.6.

**2.3.6.7 Truss Submittal Packages.** Where required by the Construction Documents or Contract, Legal Requirements or the Building Official, the Truss Manufacturer shall provide the appropriate Truss Submittal Package to one or more of the following: Building Designer and/or Contractor for review and/or approval per Section 2.3.4.2

**Section 2.3.4.2. Information Provided to the Building Designer.** The Contractor, after reviewing and/or approving the Truss Submittal Package, shall forward the Truss Submittal Package to the Building Designer for review.

**Section 2.3.4.3 Truss Submittal Package Review.** The Contractor shall not proceed with the Truss installation until the Truss Submittal Package has been reviewed by the Building Designer.

Industry guidelines for handling, installing, restraining and bracing the trusses, as provided in *BCSI*, are a crucial part of the Jobsite Package. While certainly not meant to be interpreted as superior to other possible methods or specifications concerning the handling, installing, restraining and bracing of trusses, the information provided in *BCSI*, if correctly implemented, helps to ensure consistent jobsite safety and acceptable structural performance.

### **Application:**

If pre-approval is required/requested the Truss Submittal Package is submitted to either the Building Designer and/or the Contractor for approval. The Truss manufacturer should send a Jobsite Package to every construction site. The Jobsite Package will include the Truss Submittal Package along with any other pertinent information regarding the installation of the structural building components.

Property damage, serious bodily injury and/or death are possible if the Contractor fails to properly handle, install, restrain and brace trusses. In an effort to minimize the potential for these types of disasters and to ensure that trusses are handled safely and correctly, the truss industry has developed *BCSI*, which includes simple, safe and proven methods that are consistent with accepted framing construction practices. This information is to be included in a Truss Submittal Package as defined in *ANSI/TPI 1* and as described in the *IBC* and *IRC*. In order to facilitate code compliance and job site safety, SBCA provides a standard Jobsite Package as a tool in helping Truss Manufacturers effectively fulfill their duty to educate and warn the Contractor per *ANSI/TPI 1* and building code requirements, and provide the Contractor with important standardized installation and safety information with every jobsite delivery. The truss manufacturer may add additional documents to the job site package. These additional documents may include information on other products (metal connectors/hangers, LVL, LSL, I-joists, steel beams, wall panels, etc.).

The SBCA standard Jobsite package for Wood Trusses consists of the following documents in a zippered plastic bag:

- *Information for Framers* insert in English/Spanish
- *Cover Sheet.* English/Spanish warnings on the front and some of the *ANSI/TPI 1* design responsibilities on the back.
- *TTB Checklist for Handling and Installing*
- BCSI Summary Sheets:
  - BCSI-B1: *Guide for Handling, Installing, Restraint & Bracing of Trusses*
  - BCSI-B2: *Truss Installation & Temporary Restraint/Bracing*
  - BCSI-B3: *Web Member Permanent Bracing/Web Reinforcement*
  - BCSI-B4: *Construction Loading*
  - BCSI-B11 *Fall Protection & Trusses*

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Figure 1 - Standard SBCA Jobsite Package Installation and Safety Information

SBCA has additional versions of the package for English/French, long span trusses, cold-formed steel trusses, and wall panels. Custom Jobsite Packages can be assembled. Or additional documents can be added to SBCA's standard Jobsite Package. It is recommended that the Truss Submittal Package that component manufacturers provide with each truss delivery includes the SBCA Jobsite Package. This will provide builders and erectors with best practice information regarding handling and installing components.

SBCA's legal counsel Kent Pagel provides the concepts behind this recommendation in his Structural Building Components (SBC) Magazine article entitled "[Legal Edge: He Who Supplies the Jobsite Package 'Makes the Rules' in Litigation](#)" (June/July 2009):

"Each of the documents contained within a JOBSITE PACKAGE provides the requisite information for component manufacturer customers and erectors to properly and safely unload, handle, store, install and brace manufactured structural components. Typically, manufacturers also add their truss design drawings and truss placement diagrams, and at times, some company-specific additional information to their JOBSITE PACKAGES and then make sure to include a JOBSITE PACKAGE with each delivery. For proof that the JOBSITE PACKAGE has in fact been received by the customer and the truss installer, an increasing number of component manufacturers are charging their customers for the JOBSITE PACKAGES. They mark up the cost of the JOBSITE PACKAGES modestly, but more importantly when a customer has paid for the package, during a dispute the argument that the component manufacturer never provides jobsite and product handling, installation and bracing documentation, is all but eliminated."

Further in Structural Building Components (SBC) Magazine article entitled "[The Jobsite Package: A Critical Picket in Your Fence of Protection](#)" (March 2008), the following reasons why providing genuine warnings and instructions is incumbent on the component manufacturer:

**REASON:** A Jobsite Package may very well prevent a truss collapse from occurring!

**REASON:** The Jobsite Package is geared entirely at the persons who handle, store, erect and brace structural components. As such, it is important that these persons be provided guidelines and other solid information relating to safe and proper use of trusses and components.

**REASON:** It is good risk management to provide industry-based guidelines and documentation to help your customers intelligently handle, store, brace and install the products you manufacturer and sell.

**REASON:** History has provided the industry and individual companies with sufficient notice that we must all act proactively to warn, instruct and educate. Component manufacturers are often wrongly accused of having done something wrong and it has become a reflex reaction for them to be named in each lawsuit where trusses hit the ground during or after erection. Thus, component manufacturers should take appropriate steps to warn, instruct and educate.

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### **Conclusions:**

Truss Submittal Packages consisting of the individual truss design drawings, placement plan and locations of individual truss members restraint/bracing locations (if required) may be submitted to the Contractor/Building designer for approval before manufacturing the trusses. The Contractor/Building Designer may be required to submit the Truss Submittal Package to the local building official for approval.

Jobsite Package including the Truss Submittal Package along with any other pertinent information (i.e. hanger installation guides, LVL details, etc.) is sent to the job site to promote the safe installation of the structural building components.

At a minimum, the Jobsite Package should provide the following (in addition to the Truss Design Drawings and Truss Placement Diagram, if/when required by the contract):

- For Sloped Roof Trusses: *BCSI-B1* and *BCSI-B3* Summary Sheets
- For Floor and Flat Roof Trusses: *BCSI-B1* and *BCSI-B7* Summary Sheets

### **References:**

SBCA, Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses ([BCSI](#)). Structural Building Components Association, 6300 Enterprise Lane, Madison, WI 53719

CFSC, Guide to Good Practice for Handling, Installing, Restraining & Bracing of Cold-Formed Steel Trusses ([CFSBCSI](#)). Structural Building Components Association, 6300 Enterprise Lane, Madison, WI 53719.

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