

## Design Responsibilities for Commercial Construction Projects in the State of Idaho

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### Background:

SBCA has developed this *Tech Note* to clearly outline a component manufacturer's role and responsibility for commercial construction in the context of the building code and professional engineering law applicable in the State of Idaho. This *Tech Note* is based on the current engineering laws of the state Idaho<sup>1</sup> and the 2006 Idaho Building Code, which is based on the nationally recognized model building code, the 2006 International Building Code (IBC)<sup>2</sup>.

### Issue:

For projects involving commercial construction there is usually a registered design professional (RDP) involved. Confusion often occurs if the RDP, the owner, or the contractor assumes that the truss designer/truss manufacturer performs, at the very least, a portion of the role the RDP normally supplies. In contrast, the structural building component industry operates under the expectation that the RDP is the building designer and is therefore responsible for all of those items reserved for the building designer by the building code and applicable engineering law. Since there is so much misunderstanding in the market with regard to design responsibilities, this *Tech Note* is written to help alleviate the confusion.

### Summary of Recommendations and Conclusion:

The design of building stability bracing, connections of the truss components to the building, and the flow of loads through the building are generally required to be designed by a RDP. This RDP is usually the building designer, unless he has contractually delegated these responsibilities to another party. The building code, referenced standard ANSI/TPI 1 and Idaho engineering law all provide guidance on where these responsibilities fall.

### *Building Designer*

For residential construction projects in the State of Idaho, the "building designer" is the RDP who has responsibility for the overall building design in accordance with the state's statutes and regulations. Where the jurisdiction in which the project is constructed does not require a RDP, the building designer is the building owner, builder, or contractor.

### *Truss Designer*

The building designer (i.e., owner or contractor) typically delegates the design of all the individual trusses to the truss designer. The truss designer's responsibility is to properly design the trusses according to the information provided in the Building Designer's construction documents. The truss designer does not typically design building stability bracing, connections of the truss components to the building, or the flow of loads through the building since these are outside of the scope of his responsibility and are reserved for the building designer.

<sup>1</sup>For the latest professional engineering law see the following website: <http://www3.state.id.us/idstat/TOC/54FTOC.html>

<sup>2</sup> IDAPA 07.03.01.004, adopts by reference the 2006 International Building Code, as published by the International Code Council, Inc.



Prepared with assistance from the Inland Empire Truss Fabricators Association, a local chapter of SBCA.  
View all SBCA *Tech Notes* at [www.sbcindustry.com/technotes.php](http://www.sbcindustry.com/technotes.php)

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### ***Truss Manufacturer***

The truss manufacturer's primary responsibility is to manufacture the trusses in conformance with TPI 1. Many truss manufacturers also contract with an approved third party inspection agency to perform unannounced, periodic audits of the manufacturing facility to facilitate compliance with the building code framing inspection requirements.

### ***Contractor***

The contractor is responsible for the construction means, methods, techniques, sequences, procedures, programs and safety in the context of implementing the Building Designer's construction documents. With respect to the structural building components used, the contractor is responsible for the handling, storing, installation and bracing as defined in TPI 1, *BCSI—Guide to Good Practice for Handling, Installing, Restraining and Bracing of Metal Plate Connected Wood Trusses*, or by the building designer.

The contractor is the construction professional that is most intimately familiar with the plans and specifications and how all the materials of construction must fit together to transfer all loads through the entire building to the foundation. This expertise is critical to overall building performance success.

### ***Building Official***

The building official is the person who examines the construction documents for compliance with the IRC and is responsible for ensuring any necessary inspections are made. Upon successful inspection, the building official shall either approve that portion of the construction as completed, or shall notify the permit holder (or his or her agent) wherein the same fails to comply with this code.

When the foregoing responsibilities are diligently followed, the construction means, methods, techniques, sequences, procedures, programs and safety in implementing the construction documents should proceed smoothly. This will ensure that the expectation is well met of how the plans and specifications, and all the materials of construction, fit together to transfer all the loads through the entire building to the foundation.

### **Analysis with Recommendations:**

The Structural Building Component industry, including those involved in the design and manufacture of metal plate connected wood trusses, operates under the expectation that the Building Designer and the Contractor are professionals who are competent of undertaking the work they have agreed to perform on any given commercial project, in compliance with all the legal requirements of engineering law, the building code, and the contracts that are entered into. As such, the design of building stability bracing, connections of the truss components to the building and the flow of loads through the building are, among other things, the responsibility of the building designer. The truss designer is responsible for the design of the individual truss components and those items delegated to the truss designer as described in ANSI/TPI 1. In order to understand this issue, we must refer to the building code, referenced standard ANSI/TPI 1 and engineering law for guidance. A discussion of the responsibilities of each of the entities involved in the design process as stated in these documents follows.

### ***Building Designer***

For commercial construction projects in the State of Idaho, the "building designer" as used in this *Tech Note* is the Registered Design Professional (RDP) who has responsibility for the overall building design in accordance with the state's statutes and regulations governing the professional registration and certification of architects and engineers. According to section 106.1 (*see Appendix C for complete text*) of the 2006 IBC, the construction documents shall be prepared as follows:

**2006 IBC 106.1 Submittal documents.** ... 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....

The construction documents should clearly define the scope of the project:

**2006 IBC 106.1.1 Information on construction documents.** Construction documents shall be dimensioned and drawn upon suitable material.... Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed....

The building designer, who under Idaho law for commercial construction projects is an RDP, is also the person who reviews and coordinates any construction documents that are prepared by others to make sure they do not conflict with the scope of the project, the specifics of which are listed in IBC Section 106.3.4.1 (*see Appendix C*).

**2006 IBC 106.3.4.1 General.** ...The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building....

On typical commercial construction projects, plans for fire alarm systems, manufactured trusses and sprinkler systems may not be completed at the time that the construction documents are submitted for approval. These become known as "deferred submittals," and the building designer is responsible for reviewing them for general conformance to the design of the building. This process is defined in IBC Section 106.3.4.2 (*see Appendix C*).

**2006 IBC 106.3.4.2 Deferred submittals.** ...Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building....

Nowhere in the IBC or Idaho law does it state that the design responsibilities of the parties involved change for those products handled on a deferred submittal basis.

In preparing the construction documents, the building designer needs to provide the truss designer with the information necessary to properly design the trusses for the building. According to ANSI/TPI 1-2002 (TPI 1), Chapter 2 (*see Appendix D for complete text*), which is adopted by reference in the IBC sections 102.4, 2303.4, and Chapter 35 (*see Appendix C and E*), the following information should be provided:

**ANSI/TPI 1-2002 Section 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;
  - 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.

The truss manufacturer and truss designer must rely on the building designer to take the information provided by the truss design drawing (TDD), the *Building Component Safety Information* (BCSI) booklet, and the building designer's analysis of the flow of loads through the building to design a permanent

building stability bracing system that takes the resisted truss member buckling loads (if any), and direct these loads to the building's intended load path system as follows (*see Appendix D for the full text*):

**ANSI/TPI 1-2002 Section 2.6.6** ...The approximate location for, or the maximum spacing between, permanent lateral bracing of Truss members will be indicated on the Truss Design and it shall be the responsibility of the Owner to engage the Building Designer or others to specify how the permanent lateral bracing is to be anchored or restrained to prevent lateral movement of all Truss members together....

The building designer is the professional who is most intimately familiar with the flow of loads through the entire building and is the one who can use this knowledge to ensure bracing load transfer and overall building performance success.

### ***Building Official***

The building official is the person who examines the construction documents for compliance with the IBC, the specifics of which are listed in Sections 104.2 and 106.3 (*see Appendix C*).

**104.2 Applications and permits.** The building official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

**106.3 Examination of documents.** The building official shall examine or cause to be examined the accompanying construction documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

On typical residential construction projects, plans for fire alarm systems, manufactured trusses and sprinkler systems may not be completed at the time that the construction documents are submitted for approval. They are completed and submitted to the building official at a later time. These become known as "phased approvals," and the building official is responsible for reviewing these for general code compliance. This process is defined in the IBC Section 106.3.3 (*see Appendix C*).

**106.3.3 Phased approval.** The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code....

Nowhere in the IBC or Idaho law does it state that the design responsibilities of the parties involved change for those products handled on a deferred submittal basis.

### ***Truss Designer***

The building designer typically delegates the design of all the individual trusses to the truss designer. The truss designer's responsibility is to properly design the trusses according to the information provided in the construction documents. The truss designer is responsible for the final designed truss detailed in a TDD. Section 2303.4.1 of the 2003 IBC (*see Appendix E*) outlines the exact information that needs to be on a TDD (red, bold and underline added for emphasis):

**2303.4.1.2 Truss design drawings.** The written, graphic and pictorial depiction of each individual truss shall be provided to the building official and approved prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. **Truss design drawings shall include, at a minimum, the information specified below:**

1. Slope or depth, span and spacing;
2. Location of joints;
3. Required bearing widths;

4. Design loads as applicable;
5. Top chord live load (including snow loads);
6. Top chord dead load;
7. Bottom chord live load;
8. Bottom chord dead load;
9. Concentrated loads and their points of application as applicable;
10. Controlling wind and earthquake loads as applicable;
11. Adjustments to lumber and metal connector plate design value for conditions of use;
12. Each reaction force and direction;
13. Metal connector plate type, size, thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
14. Lumber size, species and grade for each member;
15. Connection requirements for:
  - 15.1. Truss to truss;
  - 15.2. Truss ply to ply; and
  - 15.3. Field splices.
16. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
17. Maximum axial tensile and compression forces in the truss members; and
- 18. Required permanent individual truss member bracing and method per Section 2303.4.1.5, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.**

As defined in Idaho law, the building designer is responsible for the overall design and flow of loads through the building. This includes what is called the “permanent building stability bracing” for the trusses. This bracing resists forces out of the plane of the individual truss and is generally part of the seismic or wind or other external lateral force resisting system. To aid in the design of the “permanent building stability bracing,” the TDD includes items #17 and #18 so that the RDP has the information needed to generate the appropriate engineering calculations.

In the 2006 IBC, clarification was made to help with the implementation of item 18 (*see Appendix E*) as follows:

**2006 IBC 2303.4.1 Truss design drawings.** These shall include, at a minimum: ...18. Required permanent individual truss member bracing and method per Section 2303.4.1.5, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

**2006 IBC 2303.4.1.5 Truss member permanent bracing.** Where permanent bracing of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:

1. The trusses shall be designed so that the buckling of any individual truss member can be resisted internally by the structure (e.g., buckling member T-bracing, L-bracing, etc.) of the individual truss. The truss individual member buckling reinforcement shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement diagrams provided by the truss designer.
2. Permanent bracing shall be installed using standard industry bracing details (BSCI details) that conform with generally accepted engineering practice. Individual truss member continuous lateral bracing location(s) shall be shown on the truss design drawing.

Basically, the truss designer needs to provide everything that is pertinent to the design of the individual component. The building designer needs to review the TDD submittals to verify that all the structural building components and their placement comply with the construction documents. In other words, the truss designer has undertaken truss design work based on the specific information provided in the construction documents. Since the design work that is contracted for is specific to the trusses, the scope of responsibility for the truss designer is limited to the truss design drawings created from the information on the construction documents.

## ***Truss Manufacturer***

The truss manufacturer's primary responsibility is to manufacture the trusses in conformance with ANSI/TPI 1. ANSI/TPI 1 provides manufacturing quality requirements to ensure the trusses perform as anticipated by the approved TDDs. Many truss manufacturers also contract with an approved third party inspection agency to perform unannounced, periodic audits of the manufacturing facility to facilitate compliance with the building code framing inspection requirements (*see Appendix C*):

**2006 IBC 104.4 Inspections.** The building official is authorized to make all of the required inspections, or the building official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual....

**2006 IBC 109.6 Approval required.** Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the building official. The building official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code.

**2006 IBC 109.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fireblocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.

**2006 IBC R109.4 Inspection agencies.** The building official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

For more information on a specific truss industry quality control program please visit:

[www.sbcindustry.com/wtcaqc.php](http://www.sbcindustry.com/wtcaqc.php).

Many truss manufacturers include important safety information, such as BCSI, ([www.sbcindustry.com/bcsi.php](http://www.sbcindustry.com/bcsi.php)) in their jobsite packages as a guide to aid the contractor in the proper handling, installing, and bracing of metal plate connected wood trusses.

## ***Contractor***

The contractor is responsible for the construction means, methods, techniques, sequences, procedures, programs and safety in connection with the handling, storing, installation and bracing of the trusses as defined in ANSI/TPI 1 (*see Appendix D for complete text*) and adopted by reference in the IBC.

**ANSI/TPI 1-2002 Section 2.6.2** ...The Contractor...shall determine the requirements of, and provide all materials for construction in accordance with the Structural Design Documents. These requirements and materials for construction shall include all necessary items for safe construction, including design and installation of adequate temporary bracing during construction for the Building Structural System.

Further, according to ANSI/TPI 1, the contractor is responsible for the inspection of trusses to ensure that they fit for the intended application as follows:

**ANSI/TPI 1-2002 Section 2.6.3** The Contractor shall be responsible...to review or inspect Trusses delivered or to review and inspect Trusses after erection for any problems, including dislodged/missing connectors, cracked, dislodged or broken members, or any other damage that may impair the structural integrity of the Truss. In the event that damage to the Truss is discovered that would likely impair the structural integrity of the Truss, the Contractor shall be responsible to ensure that the Truss not be erected and that any area within the Building supported by any such Truss already erected shall be appropriately shored or supported to prevent further damage from occurring and shall remain clear and free of any load imposed by people, plumbing, electrical, mechanical, bridging, bracing, etc. until such field repairs have been properly completed. In the event of such damage and unless otherwise specified by Contract, the Contractor shall

contact the appropriate design professional to determine an adequate field repair and the Contractor shall be responsible to construct any such field repair.

According to ANSI/TPI 1, the truss manufacturer and truss designer must rely on the contractor to install the trusses safely and professionally:

**ANSI/TPI 1-2002 Section 2.6.5** The Truss Manufacturer and Truss Designer are not responsible for, nor do the Truss Manufacturer and Truss Designer have control of, construction means, methods, techniques, sequences, procedures, programs and safety in connection with the handling, storing, installation and bracing of the Trusses. These topics are covered in the BCSI: *Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses*. The Truss Manufacturer and Truss Designer are also not responsible for the failure to carry out the construction work related to the Trusses and the Structural Elements in accordance with the handling and installation information and/or the Structural Design Documents.

According to TPI 1, the truss manufacturer and truss designer must rely on the contractor to take the information provided by the TDD and then install all the permanent individual truss member restraint necessary to keep truss members from buckling out of plane and to integrate this with the building's load path system as specified by the building designer:

**ANSI/TPI 1-2002 Section 2.6.6** The Truss Manufacturer and Truss Designer shall not be responsible for the design, materials, or installation of permanent bracing for the Building, including bracing for all or any of the Trusses and Structural Elements. The approximate location for, or the maximum spacing between, permanent lateral bracing of Truss members [see IBC 2006 2303.4.1(18) above and in Appendix D] will be indicated on the Truss Design Drawing and it shall be the responsibility of the Owner to engage the Building Designer or others to specify how the permanent lateral bracing is to be anchored or restrained to prevent lateral movement of all Truss members together.

The contractor is the construction professional who is most intimately familiar with the plans and specifications and how all the materials of construction must fit together to transfer all the loads through the entire building to the foundation. This expertise is critical to overall building performance success.

### ***Building Inspection***

The final step in a construction project involving metal plate connected wood trusses is to have an installation inspection performed to verify that the application of all trusses are in accordance with the approved construction documents and the prevailing building code. This is typically performed by the local building official per IBC Section 109.3 (see Appendix C).

**109.3 Required inspections.** The building official, upon notification, shall make the inspections set forth in Sections 109.3.1 through 109.3.10....

**109.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fireblocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved....

**109.3.8 Other inspections.** In addition to the inspections specified above, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

**109.4 Inspection agencies.** The building official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

## Conclusion:

When the foregoing responsibilities are diligently followed, the construction means, methods, techniques, sequences, procedures, programs and safety in implementing the construction documents should proceed smoothly. This will ensure that the expectation is well met of how the plans and specifications, and all the materials of construction, fit together to transfer all the loads through the entire building to the foundation.

## Appendix A

### Key Definitions:

**BUILDING:** Any structure used or intended for supporting or sheltering any use or occupancy<sup>3</sup>.

**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.<sup>3</sup>

**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.<sup>3</sup>

**FRAMING STRUCTURAL SYSTEM:** Completed combination of Structural Elements, Trusses, connections and other systems, which serve to support the Building's self-weight and the specified loads.<sup>3</sup>

**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.<sup>3</sup>

**PERMANENT BUILDING STABILITY BRACING:** Lateral force resisting system for the Building that resists forces from gravity, wind, seismic and/or other loads.<sup>3</sup>

**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*).<sup>3</sup>

**PROFESSIONAL ENGINEER:** "Professional engineer" means a person who has been duly licensed as a professional engineer by the board under this chapter.<sup>4</sup>

**REGISTERED DESIGN PROFESSIONAL:** Architect or engineer who is licensed to practice his/her respective design profession as defined by the Legal Requirements of the Jurisdiction in which the Building is to be constructed.<sup>3</sup>

**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 wood or steel roof trusses, floor trusses, floor panels, wall panels, I-joists, or engineered beams and headers.

**TEMPORARY INSTALLATION RESTRAINT/BRACING:** Lateral Restraint and Diagonal Bracing installed during construction for the purposes of holding Trusses in their proper location, plumb and in plane, until Permanent

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<sup>3</sup> ANSI/TPI 1-2007

<sup>4</sup> As defined in the Idaho Statutes, 54-1202

Individual Truss Member Restraint, Diagonal Bracing and Permanent Building Stability Bracing are completely installed (See *BCSI-B1*, *BCSI-B2*, *BCSI-B3*, *BCSI-B7*, and *BCSI-B10*).<sup>3</sup>

**TRUSS DESIGN DRAWING:** Written, graphic and pictorial depiction of an individual Truss that includes the information required in Sections 2.3.5.5 and 2.4.5.4 (TPI 1-2007).<sup>3</sup>

**TRUSS MANUFACTURER:** Person engaged in the fabrication of Trusses. <sup>3</sup>

**BUILDING DESIGNER:** Owner of the Building, or the Person who Contracts with the Owner for the design of the Framing 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.

**TRUSS DESIGN ENGINEER:** Person who is licensed to practice engineering as defined by the Legal Requirements of the Jurisdiction in which the Building is to be constructed and who supervises the preparation of the Truss Design Drawings.

**TRUSS DESIGNER:** Person responsible for the preparation of the Truss Design Drawings.

## Appendix B

The language in RED signifies sections of the code or law that have been used in the foregoing document to make it easier for the reader to see the language in context.

### IDAHO CODE

#### TITLE 54, PROFESSIONS, VOCATIONS, AND BUSINESSES

#### CHAPTER 12, ENGINEERS AND SURVEYORS

54-1202. DEFINITIONS. As used in this chapter, unless the context or subject matter requires otherwise:

(1) "Board" means the Idaho board of licensure of professional engineers and professional land surveyors, hereinafter provided by this chapter.

(2) "Business entity" means a corporation, professional corporation, limited liability company, professional limited liability company, general partnership, limited partnership, limited liability partnership, professional limited liability partnership or any other form of business except a sole proprietorship.

(3) "Consulting engineer" means a professional engineer whose principal occupation is the independent practice of professional engineering; whose livelihood is obtained by offering engineering services to the public; who is devoid of public, commercial and product affiliation that might tend to infer a conflict of interest; and who is cognizant of his public and legal responsibilities, and is capable of discharging them.

(4) "Engineer" means a person who is qualified to practice engineering by reason of his special knowledge and use of mathematical, physical and engineering sciences, and the principles and methods of engineering analysis and design, acquired by professional education and engineering experience.

(5) "Engineer intern" means a person who has qualified for, taken and passed an examination in the fundamentals of engineering subjects as provided in this chapter.

(6) "Land surveyor intern" means a person who has qualified for, taken and passed an examination in the fundamentals of surveying subjects as provided in this chapter.

(7) "Professional engineer" means a person who has been duly licensed as a professional engineer by the board under this chapter.

(8) "Professional engineering" and "practice of professional engineering" mean any service or creative work offered to or performed for the public for any project physically located in this state, such as consultation, investigation, evaluation, planning, designing, teaching upper division engineering design subjects, and responsible charge of observation of construction in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the public welfare or the safeguarding of life, health, or property is concerned or involved, when such service requires the application of engineering principles and data. A person shall be construed to practice or offer to practice professional engineering within the meaning and intent of this chapter who practices or offers to practice any of the branches of the profession of engineering for the public for any project physically located in this state or who, by verbal claim, sign, advertisement, letterhead, card, or in any other way represents himself to be a professional engineer or through the use of some other title implies that he is a professional engineer or that he is licensed under this chapter, or holds himself out as able to perform or who does perform for the public for any project physically located in this state, any engineering service or work or any other service designated by the practitioner which is the practice of professional engineering.

(9) "Professional land surveying" and "practice of professional land surveying" mean responsible charge of surveying of land to determine the correct boundary description, to convey, to establish or reestablish land boundaries, or to plat lands and subdivisions thereof. Any person shall be construed to practice or offer to practice professional land surveying who engages in professional land surveying, or who, by verbal claim, sign, advertisement, letterhead, card, or in any other way represents himself to be a professional land surveyor, or who represents himself as able to perform or who does perform any professional land surveying service or work or any other service designated by the practitioner which is professional land surveying.

(10) "Professional land surveyor" means a person who is qualified by reason of his knowledge of the principles of land surveying acquired by education and practical experience to engage in the practice of professional land surveying and who has been duly licensed as a professional land surveyor by the board under this chapter.

(11) "Public" means any person, firm, corporation, partnership, company, government agency, institution or any other entity recognized by law.

(12) "Responsible charge" means the control and direction of engineering work, or the control and direction of land surveying work, requiring initiative, professional skill, independent judgment and professional knowledge of the content of relevant documents during their preparation.

Except as allowed under section 54-1223, Idaho Code, reviewing, or reviewing and correcting, documents after they have been prepared by others does not constitute the exercise of responsible charge.

(13) "Rules of professional responsibility" means those rules, if any, promulgated by the board, as authorized by the Idaho Code.

(14) "Signature" means either: an original handwritten message identification containing the name of the person who applied it; or a digital signature which is an electronic authentication process attached to or logically associated with an electronic document. The digital signature must be unique to the person using it; must be capable of verification; must be under the sole control of the person using it; and must be linked to a document in such a manner that the digital signature is invalidated if any data in the document is changed.

(15) "Standard design plan" means a building, structure, equipment or facility which is intended to be constructed or sited at multiple locations and for which some or all of the plans must be prepared by a professional engineer.

## Appendix C

International Code Council  
2006 International Building Code (IBC)  
Part I: ADMINISTRATION

### Chapter 1 ADMINISTRATION SECTION R102: APPLICABILITY

**102.4 Referenced codes and standards.** The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

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### SECTION 106: CONSTRUCTION DOCUMENTS

**106.1 Submittal documents.** Construction documents, statement of special inspections and other data shall be submitted in one 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.

**106.1.1 Information on construction documents.** Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when 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.

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#### 106.3.4 Design professional in responsible charge.

**106.3.4.1 General.** When it is required that documents be prepared by a registered design professional, the building official shall be authorized to require the owner to engage and designate on the building permit application a registered design professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The building official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties.

The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

Where structural observation is required by Section 1709, the statement of special inspections shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur (see also duties specified in Section 1704).

**106.3.4.2 Deferred submittals.** For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the building official within a specified period. Deferral of any submittal items shall have the prior approval of the building official. The

registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official. Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the design and submittal documents have been approved by the building official.

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## **SECTION 104: DUTIES AND POWERS OF BUILDING OFFICIAL**

**104.4 Inspections.** The building official shall make all of the required inspections, or the building official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The building official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

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## **SECTION 109: INSPECTIONS**

**109.3 Required inspections.** The building official, upon notification, shall make the inspections set forth in Sections 109.3.1 through 109.3.10.

**109.3.1 Footing and foundation inspection.** Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

**109.3.2 Concrete slab and under-floor inspection.** Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

**109.3.3 Lowest floor elevation.** In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 shall be submitted to the building official.

**109.3.4 Frame inspection.** Framing inspections shall be made after the roof deck or sheathing, all framing, fireblocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.

**109.3.5 Lath and gypsum board inspection.** Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.

**Exception:** Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

**109.3.6 Fire-resistant penetrations.** Protection of joints and penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.

**109.3.7 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: envelope insulation  $R$  and  $U$  values, fenestration  $U$  value, duct system  $R$  value, and HVAC and water-heating equipment efficiency.

**109.3.8 Other inspections.** In addition to the inspections specified above, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

**109.3.9 Special inspections.** For special inspections, see Section 1704.

**109.3.10 Final inspection.** The final inspection shall be made after all work required by the building permit is completed.

**109.4 Inspection agencies.** The building official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

**109.5 Inspection requests.** It shall be the duty of the holder of the building permit or their duly authorized agent to notify the building official when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

## Chapter 35 REFERENCED STANDARDS

<b>TPI</b>	Truss Plate Institute 583 D'Onofrio Drive, Suite 200 Madison, WI 53719	
	Standard reference number	Referenced in code section number
TPI 1—2002	Title National Design Standards for Metal-Plate-Connected Wood Truss Construction .....	2303.4, 2306.1

## Appendix E

ANSI/TPI 1-2002

National Design Standard for Metal Plate Connected Wood Truss Construction

Chapter 2 – Standard Responsibilities in the Design Process Involving Metal Plate Connected Wood Trusses

### 2.5 BUILDING STRUCTURAL SYSTEM DESIGN DOCUMENTS

- 2.5.1 The Building Designer, through the Structural Design Documents shall provide that the Structural Elements and Trusses shall not be subjected to adverse influences including, but not limited to moisture, temperature, and corrosive chemicals and gases. This provision shall specifically include notice for the Truss Designer of environments expected to result in wood moisture content exceeding 19 percent, and temperatures and/or corrosion potential that are unusually high relative to typical wood buildings.
- 2.5.2 The Building Designer, through the Structural Design Documents shall provide information sufficiently accurate and reliable to be used for facilitating the supply of the Structural Elements and for developing the design of the Trusses for the Building, and 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 including, but not limited to, loads attributable to: roof, floor, partition including any directions other than given in ANSI/TPI 1-2002, mechanical, fire sprinkler, attic, storage, rain loads and ponding, design wind speed and exposure category, snow, snow drift, unbalanced snow load, and seismic forces;
- 2.5.2.5 All Structural Element and Truss anchorage designs required to resist uplift, gravity, and lateral loads;
- 2.5.2.6 Allowable vertical and horizontal deflection criteria and any specific criteria per ANSI/TPI 1-2002;
- 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, including Truss to Structural Element connections, but not Truss to Truss girder connections except such connections that are excluded from the scope of the Truss Designer's responsibilities.
- 2.5.2.9 Permanent bracing design for the Building, including bracing to resist wind, seismic, or other lateral forces, and permanent bracing for all Structural Elements and Trusses. The permanent bracing design shall incorporate the continuous lateral chord and web member bracing that is designated on the individual Truss Design Drawings into the overall bracing for the entire Building Structural System.
- 2.5.3 The Building Designer shall be responsible for the adequacy of the design of the Building Structural System or the adequacy of the Structural Design Documents. The Building Designer shall evaluate the effect of the Trusses and the Structural Elements supplied, on the Building Structural System.

## 2.6 CONSTRUCTION RELATED ITEMS

- 2.6.1 Truss Submittals and Structural Element Submittals, and any supplemental information provided by the Truss Manufacturer, shall be provided to the Contractor or the individual or organization responsible for the installation of the Trusses and Structural Elements.
- 2.6.2 The Building Designer shall be responsible for determining appropriate field storage, handling, and installation measures for the Trusses and Structural Elements. The Contractor, unless otherwise specifically assigned by Contract, shall determine the requirements of, and provide all materials for construction in accordance with the Structural Design Documents. These requirements and materials for construction shall include all necessary items for safe construction, including design and installation of, adequate temporary bracing during construction for the Building Structural System.
- 2.6.3 The Contractor shall be responsible, unless otherwise assigned by Contract, to review or inspect Trusses delivered or to review and inspect Trusses after erection for any problems, including dislodged/missing connectors, cracked, dislodged or broken members, or any other damage that may impair the structural integrity of the Truss. In the event that damage to the Truss is discovered that would likely impair the structural integrity of the Truss, the Contractor shall be responsible to ensure that the Truss not be erected and that any area within the Building supported by any such Truss already erected shall be appropriately shored or supported to prevent further damage from occurring and shall remain clear and free of any load imposed by people, plumbing, electrical, mechanical, bridging, bracing, etc. until such field repairs have been properly completed. In the event of such damage and unless otherwise specified by Contract, the Contractor shall contact the appropriate design professional to determine an adequate field repair and the Contractor shall be responsible to construct any such field repair.
- 2.6.4 All Truss repairs shall be approved in writing by a Building Designer or a Truss Designer or other qualified person prior to the performance of the repair.
- 2.6.5 The Truss Manufacturer and Truss Designer are not responsible for, nor do the Truss Manufacturer and Truss Designer have control of, construction means, methods, techniques, sequences, procedures, programs and safety in connection with the handling, storing, installation and bracing of the Trusses. These topics are covered in the BCSI: *Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses*. The Truss Manufacturer and Truss Designer are also not responsible for the failure to carry out the construction work related to the Trusses and the Structural Elements in accordance with the handling and installation information and/or the Structural Design Documents.
- 2.6.6 The Truss Manufacturer and Truss Designer shall not be responsible for the design, materials, or installation of permanent bracing for the Building, including bracing for all or any of the Trusses and Structural Elements. The approximate location for, or the maximum spacing between, permanent lateral bracing of Truss members will be indicated on the Truss Design and it shall be the responsibility of the Owner to engage the Building Designer or others to specify how the permanent lateral bracing is to be anchored or restrained to prevent lateral movement of all Truss members together. Consideration shall be given to one of the following methods for providing this restraint or anchorage: (a) permanent diagonal bracing in the plane of the Truss members; or (b) other means when demonstrated by the Building Designer or other qualified person to provide equivalent lateral resistance.

## Appendix F

### 2006 International Building Code Chapter 23 WOOD SECTION 2303: MINIMUM STANDARDS AND QUALITY

#### 2303.4 Trusses.

**2303.4.1 Design.** Wood trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by nails, glue, bolts, timber connectors, metal connector plates or other approved framing devices.

**2303.4.1.1 Truss designer.** The individual or organization responsible for the design of trusses.

**2303.4.1.2 Truss design drawings.** The written, graphic and pictorial depiction of each individual truss shall be provided to the building official and approved prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of joints;
3. Required bearing widths;
4. Design loads as applicable;
5. Top chord live load (including snow loads);
6. Top chord dead load;
7. Bottom chord live load;
8. Bottom chord dead load;
9. Concentrated loads and their points of application as applicable;
10. Controlling wind and earthquake loads as applicable;
11. Adjustments to lumber and metal connector plate design value for conditions of use;
12. Each reaction force and direction;
13. Metal connector plate type, size, thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
14. Lumber size, species and grade for each member;
15. Connection requirements for:
  - 15.1. Truss to truss;
  - 15.2. Truss ply to ply; and
  - 15.3. Field splices.
16. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
17. Maximum axial tensile and compression forces in the truss members; and
18. Required permanent individual truss member bracing and method per Section 2303.4.1.5, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

Where required by one of the following, each individual truss design drawing shall bear the seal and signature of the truss designer:

1. Registered design professional; or
2. Building official; or
3. Statutes of the jurisdiction in which the project is to be constructed.

#### Exceptions:

1. When a cover sheet/truss index sheet combined into a single cover sheet is attached to the set of truss design drawings for the project, the single sheet/truss index sheet is the only document that needs to be signed and sealed within the truss submittal package.

2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings for the project, both the cover sheet and the truss index sheet are the only documents that need to be signed and sealed within the truss submittal package.

**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.

**2303.4.1.4 Truss submittal package.** The truss submittal package shall consist of each individual truss design drawing, the truss placement diagram for the project, the truss member permanent bracing specification and, as applicable, the cover sheet/truss index sheet.

**2303.4.1.5 Truss member permanent bracing. Where permanent bracing of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:**

**1. The trusses shall be designed so that the buckling of any individual truss member can be resisted internally by the structure (e.g. buckling member T-bracing, L-bracing, etc.) of the individual truss. The truss individual member buckling reinforcement shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement diagrams provided by the truss designer.**

**2. Permanent bracing shall be installed using standard industry bracing details that conform with generally accepted engineering practice. Individual truss member continuous lateral bracing location(s) shall be shown on the truss design drawing.**

**2303.4.1.6 Anchorage.** All transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

**2303.4.1.7 Alterations to trusses.** Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.

**2303.4.2 Metal-plate-connected trusses.** In addition to Sections 2303.4.1 through 2303.4.1.7, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Manufactured trusses shall comply with Section 1704.6 as applicable.



Prepared with assistance from the Inland Empire Truss Fabricators Association, a local chapter of SBCA.  
View all SBCA *Tech Notes* at [www.sbcindustry.com/technotes.php](http://www.sbcindustry.com/technotes.php)