

**Inspection and Quality Assurance
Requirements for Metal Plate
Connected Wood Trusses**

Educational Overview



Introduction

- What do the codes say about requirements for inspection and quality assurance of trusses?
- The answer can be found in:
 - International Building Code (IBC) Chapters 1 and 17
 - International Residential Code (IRC) Chapter 1
 - ANSI/TPI 1 Chapters 2 and 3



Code Requirements

- However, there is often confusion about truss inspection requirements
 - Inspection requirements are scattered throughout the codes
 - Definitions and terminology are unfamiliar to most people



Code Requirements

- Short answer:
 - Is truss manufacturing subject to Chapter 17 requirements for Special Inspections? NO
 - Does the third party inspection process satisfy code requirements? YES



Key Definitions

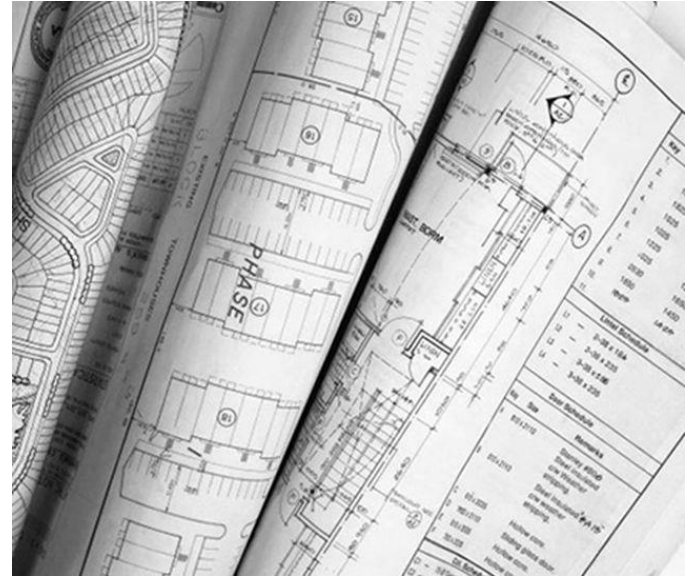
- **Building Code** – As It Applies To A Building, Any Set Of Standards Set Forth And Enforced By A Jurisdiction For The Protection Of Public Safety.
- **Building Official** – Officer Or Other Designated Authority Charged With The Administration And Enforcement Of The Building Code, Or A Duly Authorized Representative.
- **Building Permit** – Certificate Of Permission Issued By A Jurisdiction To An Owner To Construct, Enlarge, Or Alter A Building.
- **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.
- **Jurisdiction** – Governmental Unit That Has Adopted This Code Under Due Legislative Authority.
- **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.

Key Definitions

- **Special Inspection** – Inspection of construction requiring the expertise of an approved special inspector in order to ensure compliance with this code and the approved construction documents.
- **Structural Element** – Single structural member (other than a Truss) that is specified in the Construction Documents.
- **Structural Observation** – The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents.
- **Truss** – Individual metal-plate-connected wood component manufactured for the construction of a Building.
- **Truss Manufacturer** – Person engaged in the fabrication of Trusses.

IBC and IRC Chapter 1

- Contains general provisions for:
 - Submission of construction documents
 - Approval of the documents by the building official
 - General building inspection requirements



IBC Chapter 17

- Special Inspections
 - Where required, are in addition to inspections required by Chapter 1
 - Performed by approved agencies
 - Special Inspectors have expertise in a field of knowledge that the building official may not
 - May or may not be registered design professionals



IBC Chapter 17

- Structural Observations
 - May also be required in addition to Special Inspections
 - Performed by registered design professionals
 - Generally reserved for building systems resisting high seismic and high wind forces



ANSI TPI 1

- Standard is referenced by the codes
- Addresses requirements for the design and manufacture of MPCWT
 - Includes provisions for inspection and quality assurance



IBC and IRC Chapter 1

- The Building Official is responsible for all the required inspections of Buildings, which includes the structural framing (and the trusses that comprise it)
 - This role can be delegated to approved agencies or individuals.
- [IBC 104.4 Inspections.](#)
- [IRC R104.4 Inspections.](#)

IBC and IRC Chapter 1

- The entire inspection process for metal plate connected wood trusses is outlined in IBC Section 110 and IRC Section 109 where it is stated that framing inspections are to be performed by the Building Official.
- If the Trusses are manufactured in a manufacturing facility, the inspection process needs to be performed by an approved inspection agency.
- **IRC R109.1 Types of inspections.**
- **IRC R109.1.4 Frame and masonry inspection.**
- **IRC R109.2 Inspection agencies.**

IBC Chapter 17 – Special Inspections and Structural Observations

- IBC Chapter 17 defines when special inspections are required, and what items are included in the special inspection provisions.
- MPCWT do not require special inspections, UNLESS they are greater than 60 foot span.
- **1705.5.2 Metal-plate-connected wood trusses spanning 60 feet or greater.**

IBC Chapter 17 – Special Inspections and Structural Observations

- Special inspections are intended for:
 - Special occupancies
 - Circumstances with critical seismic and wind conditions
 - Where a Structural Element is deemed critical from a life safety perspective
- [IBC 1704.6 Structural observations.](#)
- [IBC 1704.6.1 Structural observations for seismic resistance.](#)
- [IBC 1704.6.2 Structural observations for wind requirements.](#)

IBC Chapter 17 – Special Inspections and Structural Observations

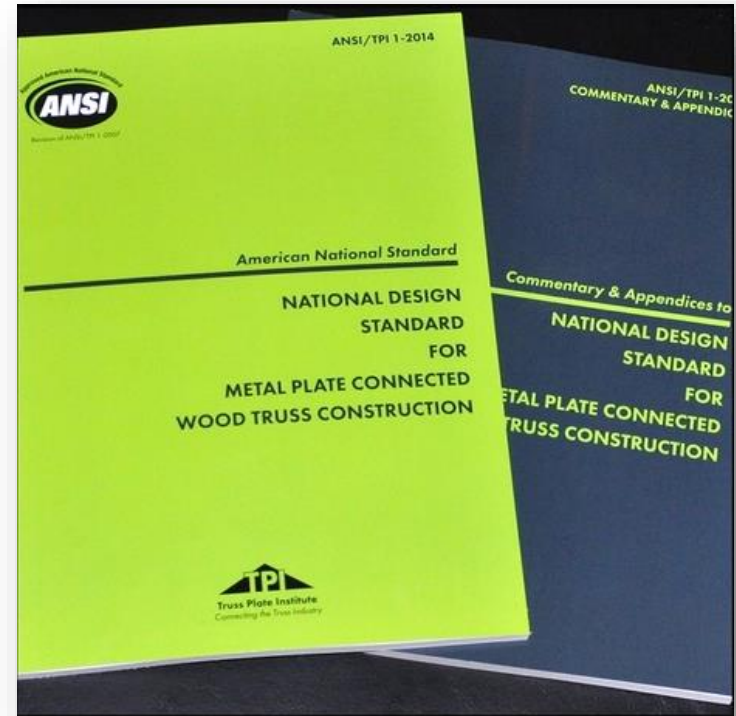
- Section 1704 does not require special inspections for MPCWT
- Furthermore, 1704.2 lists an exception for conventional light-frame construction, which would include the majority of construction using MPCWT and other components.
- [IBC 1704.2 Special inspections.](#)

IBC Chapter 17 – Special Inspections and Structural Observations

- ANSI/TPI 1 includes provisions that are upheld under the supervision of a third party quality control agency.
- The third party QC process that many Truss Manufacturers employ is done at the manufacturing facility and takes the place of any special inspection requirements.
- **IBC 1704.2.5.1**
Fabricator approval

ANSI/TPI 1

- The Building Codes reference ANSI-based consensus codes and standards to provide specific information that would be unwieldy to include in the codes themselves.
- The codes state in several locations that the design and manufacture of metal plate connected wood trusses shall comply with ANSI/TPI 1.



ANSI/TPI 1

- ANSI/TPI 1 in-plant inspection process was clarified in the 2014 edition, and is referenced by the 2015 editions of both the IBC and IRC.
- ANSI/TPI 1-2014 Chapter 3 (Quality Criteria for the Manufacture of Metal-Plate-Connected Wood Trusses) implements the in-plant quality control process.
- **ANSI/TPI 1-2014**
 - **Section 2.3.6.11 In-Plant Truss Inspections.**
 - **Section 3.1 GENERAL**
 - **Section 3.2 IN-PLANT QUALITY ASSURANCE**

Closing Thoughts

- The traditional third party inspection process satisfies IBC and IRC requirements for metal plate connected wood trusses
- Truss manufacturing:
 - Must conform to ANSI/TPI 1, which follows IBC and IRC requirements for regular third party inspections to evaluate compliance
 - Does not fall under the IBC Chapter 17 definition of “Fabricated Item”
- Thus, there is no requirement to have an on-site “special inspection” of the Trusses