

Florida Projects Constructed Without a Truss System Engineer (No Contract in Place for Truss System Engineering Duties)

Updated June 3, 2008

Introduction:

The Florida Statutes, Sections 471.007 - 471.008, authorizes the Florida Board of Professional Engineers (FBPE) to create rules which are binding as laws. On April 30, 2003, the FBPE implemented a state rule, *Florida Administrative Code (FAC) 61G15-31.003, "Design of Structures Utilizing Prefabricated Wood Trusses"* (the "FBPE 2003 Rule") (see **Appendix E** for complete text). The intent of this rule is to add industry specific definitions and then to clearly define two specific engineering roles that an engineer may take with respect to truss and/or truss system design work in Florida.

Issue:

The FBPE 2003 Rule defines the potential involvement of three separate design professionals for structures that utilize wood trusses: (1) the Structural Engineer of Record (SEOR); (2) the Truss System Engineer (TSE); and (3) the Truss Design Engineer (TDE).

A recent letter from a Florida Structural Engineering firm¹ clearly lays out the delegated tasks and responsibilities for their projects. This letter assumes that all three parties (SEOR, TSE and TDE) will be involved in said projects:

ATTN: All Builders, Draftsmen, and Architects

RE: Truss Design Engineer, Truss System Engineer, and Engineer of Record

This letter shall serve as an official written documentation required to be presented to the Truss Design and Truss System Engineer for all projects under the responsible charge of XYZ Engineering. The following box shall be inserted into your standard detail sheets.

- Truss Design Engineer's delegated responsibility shall include the design of the individual trusses in accordance with the included design criteria. All work completed by the Truss Design Engineer shall be signed and sealed and shall be in compliance with the Florida Administrative Code 61G15-31.003.
- Truss System Engineer's delegated responsibility shall include the design of the truss system and shall include all truss to truss connections, all bracing required for the individual trusses, and the truss placement diagram. All work completed by the Truss System Engineer shall be signed and sealed and shall be in compliance with the Florida Administrative Code 61G15-31.003.

¹ This is taken verbatim from an actual letter from an engineering firm in Florida. We have not provided the name of the engineering firm in this *Tech Note*. Since the letter is in the public domain, should you desire to have a copy please contact WTCA.



Prepared with assistance from Florida Chapters of SBCA, a local chapter of SBCA.

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XYZ Engineering will be responsible for the design of the roof diaphragm including sheathing thickness, nailing pattern, and any blocking required between trusses. The Engineer of Record shall also provide all connections required from the individual trusses to the structure.

The 2004 FBC and the 2004 FRC require that the truss to truss connections shall be listed on the individual truss design drawings. These connections are not currently listed on the truss design drawings, however these call-outs shall be the responsibility of the truss system engineer and shall be included on the truss placement diagram as well.

Please be aware that any non-conforming component or design will cause delays in the construction process. Forward this memo to your individual truss engineer and truss system engineer to ensure their complete understanding of the delegated tasks and responsibilities.

In the specific case and very often in the Florida market there is no Truss System Engineer to delegate Truss System Engineer responsibilities to. Who then becomes responsible for the scope of work required to be performed by the Truss System Engineer?

Industry Recommendation:

Although the responsibilities of a Truss System Engineer are clearly set forth in the FBPE rules, this does not mean that a separate entity will act as a Truss System Engineer on every project. To fulfill its scope of work the Truss Manufacturer will always employ or retain a Truss Design Engineer. The FBPE rules clearly state that the Truss Design Engineer is responsible for the single truss design depicted on each Truss Design Drawing. The Truss Design Engineer's responsibility under the *Florida Building Code* and FBPE rules is to properly design the trusses according to the information provided in the construction documents.

Should the Registered Design Professional desire to delegate the design of the roof or floor system to a Truss System Engineer, they will need to:

1. Find a professional engineer who has the requisite expertise to undertake the role of the Truss System Engineer and communicate in writing the specific engineering requirements.
2. Find a Truss Manufacturer and Truss Design Engineer that have the expertise and ability to broaden their scope of work on the project. This will be done under a separate contract based on the specific written engineering requirements and an appropriate bid for the cost of the work can then be provided.

Finally, as mentioned above, the Registered Design Professional is ultimately responsible for all engineering decisions and the health, safety, and welfare of the public as it relates to the design of the building thus if a separate Truss System Engineer can not be retained the Registered Design Professional would assume the responsibility of the Truss System Engineer.

Appendix A

Background & Analysis:

The *Florida Building Code (FBC)* defines a Registered Design Professional (RDP):

REGISTERED DESIGN PROFESSIONAL. 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.

The Registered Design Professional may also be called the Building Designer and in the case of the FBPE the Registered Design Professional may be the Structural Engineer of Record who then may be the Building Designer:

CHAPTER 61G15-31.003 Design of Structures Utilizing Prefabricated Wood Trusses.

(1) When a Structural Engineer of Record and a Delegated Engineer exist as may be determined by applicable Florida law, the apportionment of responsibilities between the Structural Engineer of Record and a Delegated Engineer shall be as set forth in Chapter 2 of ANSI/TPI 1-1995, wherein the Structural Engineer of Record is the Building Designer and the Delegated Engineer is the Truss Designer as those terms are defined in said standard.

For the sake of this document, we will use the code defined Registered Design Professional to mean Building Designer and Structural Engineer of Record.

The *FBC (see Appendix C for complete text)* also provides that the construction documents for a project shall be prepared by a Registered Design Professional. In particular, the *FBC* states:

FBC 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 in turn clearly define the scope of the work proposed by the Registered Design Professional who is responsible for the overall design and flow of loads through the building.

FBC 106.1.1 Information on construction documents. ...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...

In preparing the construction documents, the Registered Design Professional needs to provide the Truss Design Engineer with the information necessary to properly design the trusses for the building. According to *TPI 1*, the following information is required to be provided (*see Appendix D for complete text*):

ANSI/TPI 1 Chapter 2

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

- 2.5.2.1 All Structural Element and Truss orientations and locations;
- 2.5.2.2 Information to fully determine all Truss profiles;
- 2.5.2.3 All Structural Element and Truss bearing conditions;
- 2.5.2.4 The location, direction, and magnitude of all dead and live loads applicable to each Structural Element and Truss...
- 2.5.2.5 All Structural Element and Truss anchorage designs required to resist uplift, gravity, and lateral loads;
- 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 rules of the FBPE govern the conduct of the following groups of professional engineers in Florida: the Engineer of Record, the Prime Professional, and Delegated Engineer (*see Appendix E for complete text*).

FAC 61G15-18.011 Definitions.

- (b) Engineering decisions which must be made by and are the responsibility of the Engineer of Record are those decisions concerning permanent or temporary work which could create a danger to the health, safety, and welfare of the public, such as, but not limited to, the following:
 1. The selection of engineering alternatives to be investigated and the comparison of alternatives for engineering works.
 2. The selection or development of design standards or methods, and materials to be used.
 3. The selection or development of techniques or methods of testing to be used in evaluating materials or completed works, either new or existing.
 4. The development and control of operating and maintenance procedures.

FAC 61G15-30.002 Definitions Common to All Engineer's Responsibility Rules.

- (1) Engineer of Record. A Florida professional engineer who is in responsible charge for the preparation, signing, dating, sealing and issuing of any engineering document(s) for any engineering service or creative work.
- (2) Prime Professional. A Florida professional engineer, or a duly qualified engineering corporation or partnership, who is engaged by the client to provide any planning, design, coordination, arrangement and permitting for the project and for construction observations in connection with any engineering project, service or creative work. The prime professional engineer may also be an engineer of record on the same project.
- (3) Delegated Engineer. A Florida professional 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....

FAC 61G15-30.007 Prime Professional's Responsibility.

It is the responsibility of the prime professional engineer to retain and coordinate the services of such other professionals as needed to complete the services contracted for the project.

Based on this information the Registered Design Professional is also the Engineer of Record (EOR) who may also be the Prime Professional (PP). For the sake of this document, the Registered Design Professional is the same as the Engineer of Record is the same as the Prime Professional.

Florida law clearly states the requirements of delegation in Chapter 61G15-30.005 (*see Appendix E*) and is very clear that the scope of work that the delegated engineer is to undertake must be clearly communicated in writing:

FAC 61G15-30.005 Request for and Review of Delegated Engineering Documents.

- (1) An engineer of record who delegates a portion of his responsibility to a delegated engineer is obligated to communicate in writing his engineering requirements to the delegated engineer.
- (2) An engineer of record who delegates a portion of his design responsibility to a delegated engineer shall require submission of delegated engineering documents prepared by the delegated engineer and shall review those documents for compliance with his written engineering requirements and to confirm the following:

- (a) That the delegated engineering documents have been prepared by an engineer.
- (b) That the delegated engineering documents of the delegated engineer conform with the intent of the engineer of record and meet the written criteria.
- (c) That the effect of the delegated engineer's work on the overall project generally conforms with the intent of the engineer of record.

Since the Truss Manufacturer either employs or retains the services of a Truss Design Engineer, it is logical that the Registered Design Professional delegates the design of the trusses to the Truss Design Engineer in accordance with Chapter 61G15-31.003 (*see Appendix E*):

FAC 61G15-31.003 Design of Structures Utilizing Prefabricated Wood Trusses.

(3) For the purposes of this rule, the following definitions shall apply: ... (c) "Truss Design Engineer" shall mean an engineer who designs individual trusses, but does not design a Truss System.

In general, since the Registered Design Professional P is responsible for all engineering decisions as it relates to the design of the building (*see 61G15-31.001 below and Appendix E*), the Registered Design Professional assumes the responsibility of the Truss System Engineer. This is due to the fact that the proper flow of all the loads through the building is a health, safety, and welfare of the public consideration, which is also the responsibility of the Registered Design Professional.

61G15-31.001 General Responsibility.

The engineer of record for a structure is responsible for all structural aspects of the design of the structure including the design of all of the structure's systems and components. ...

The Registered Design Professional may attempt to delegate the roof or floor system design to a Truss System Engineer, should one be available. Since Truss Manufacturer is not a Truss System Engineer and do not typically retain the services of a Truss System Engineer, the Truss Manufacturer cannot provide this service.

The Truss Design Engineer by law will be provided to the Registered Design Professional and Truss System Engineer, if the truss system engineering has to be delegated by the Registered Design Professional and the Truss System Engineer is a known entity by the Truss Design Engineer. The Truss Design Drawing (TDD), pursuant to the *FBC* requirements provides (*see Appendix C*) the following information:

FBC 2303.4.1 Truss design drawings. These shall include, at a minimum:

1. Slope or depth, span and spacing;
2. Location of all 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;
10. Controlling wind and earthquake loads;
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 girder;
 - 15.2 Truss ply to ply;
 - 15.3 Field splices;

16. Calculated deflection ratio or maximum description for live and total load;
17. Maximum axial compression forces in the truss members to design the size, connections and anchorage of the permanent continuous lateral bracing. Forces shall be shown on the truss construction documents or on supplemental documents; and
18. Required permanent truss member bracing location. (Note, this is also known as the “permanent individual truss member bracing.”)

Note: As defined in Florida law the Registered Design Professional 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 “permanent building stability bracing” the TDD includes items #17 and #18 so that the Registered Design Professional 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 F*) 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 that conform with generally accepted engineering practice. Individual truss member continuous lateral bracing location(s) shall be shown on the truss design drawing.

The proposed 2009 IBC language provides the following enhancement to the 2006 IBC language listed above:

Proposed 2009 IBC 2303.4.1.2 Truss member permanent bracing. ...In the absence of specific bracing requirements, trusses shall be braced in accordance with the Building Component Safety Information (BCSI 1) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

By providing the foregoing information, the Truss Design Engineer has shown that the truss design work is based on the information provided in the construction documents. The scope of responsibility for the Truss Design Engineer is thus limited to the created Truss Design Drawings. In compliance with Florida engineering law (*see Appendix E*), engineers are responsible for clearly noting the extent of their responsibility in an engineering project.

CHAPTER 61G15-31.003 Engineering Document Classification. ... When elements of the project are shown on an engineering document only for information or clarification and the Engineer does not intend to accept responsibility for the elements, the engineer shall clearly note on the documents the extent of his responsibility.

In accordance with the law, the Registered Design Professional then needs to review the Truss Design Drawing submittals to verify that all the components and their placement comply with his written engineering requirements.

The Truss Manufacturer and their Truss Design Engineer would only undertake Truss System Engineer responsibilities under a special set of circumstances if capable and when properly compensated. If the Truss Manufacturer and their Truss Design Engineer do not agree to the special set of circumstances, the responsibilities of the Truss System Engineer are by law placed on the Registered Design Professional who according to *FAC 61G15-30.002* is in responsible charge of the project.

Appendix B

Key Definitions:²

DELEGATED ENGINEER: A Florida professional 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. A delegated engineer usually falls into one of the following categories:

- (a) An independent consultant.
- (b) An employee or officer of an entity supplying components to a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.
- (c) An employee or officer of a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.

DELEGATED ENGINEERING DOCUMENTS: Delegated engineering documents are those engineering documents that are prepared by a delegated engineer.

ENGINEER OF RECORD: A Florida professional engineer who is in responsible charge for the preparation, signing, dating, sealing and issuing of any engineering document(s) for any engineering service or creative work.

ENGINEERING DOCUMENTS: Engineering documents are designs, plans specifications, drawings, prints, reports, or similar instruments of service in connection with engineering services or creative work that have been prepared and issued by the professional engineer or under his responsible supervision, direction or control.

PRIME PROFESSIONAL: A Florida professional engineer, or a duly qualified engineering corporation or partnership, who is engaged by the client to provide any planning, design, coordination, arrangement and permitting for the project and for construction observations in connection with any engineering project, service or creative work. The prime professional engineer may also be an engineer of record on the same project.

TRUSS DESIGN DRAWING: The written, graphic and pictorial depiction of an individual truss.

TRUSS DESIGN ENGINEER: An engineer who designs individual trusses, but does not design a Truss System.

TRUSS PLACEMENT DIAGRAM: The illustration supplied by the truss manufacturer identifying the location assumed for each truss, which references each individually designated Truss design Drawing.

TRUSS SYSTEM: An assemblage of trusses and truss girders, together with all bracing, connections, and other structural elements and all spacing and placement, that, in combination, function to support the dead, live and wind loads applicable to the roof of a structure with respect to a Truss System for the roof, and the floor of a structure with respect to a Truss System for the floor. A Truss System does not include walls, foundations, or any other structural support systems.

TRUSS SYSTEM ENGINEER: An engineer who designs a Truss System.

² As defined by the addendum to Chapter 2 of ANSI/TPI 1-2002 *National Design Standard for Metal Plate Connected Wood Truss Construction* and the Florida Administrative Code (FAC) 61G15-31.003, *"Design of Structures Utilizing Prefabricated Wood Trusses"*.

Appendix C

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.

2004 Florida Building Code Chapter 1 ADMINISTRATION SECTION 102: APPLICABILITY

FBC 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.

2004 Florida Building Code Chapter 1 ADMINISTRATION SECTION 106: CONSTRUCTION DOCUMENTS

FBC 106.1 Submittal documents. Construction documents, special inspection and structural observation programs, and other data shall be submitted in one or more sets with each application for a permit. 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.

FBC 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 (see also Section 106.3.5).

2004 Florida Building Code Chapter 23 WOOD SECTION 2302: MINIMUM STANDARDS AND QUALITY

2303.4 Trusses. Metal-plate-connected wood trusses shall be manufactured as required by TPI 1. Each manufacturer of trusses using metal plate connectors shall retain an approved agency to make unscheduled inspections of truss manufacturing and delivery operations. The inspection shall cover all phases of truss operations, including lumber storage, handling, cutting fixtures, passes or rollers, manufacturing, bundling and banding.

2303.4.1 Truss design drawings. These shall include, at a minimum:

1. Slope or depth, span and spacing;
2. Location of all 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;
10. Controlling wind and earthquake loads;
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 girder;
 - 15.2 Truss ply to ply;
 - 15.3 Field splices;
16. Calculated deflection ratio or maximum description for live and total load;
17. Maximum axial compression forces in the truss members to design the size, connections and anchorage of the permanent continuous lateral bracing. Forces shall be shown on the truss construction documents or on supplemental documents; and
18. Required permanent truss member bracing location.

**2004 Florida Building Code
Chapter 35 REFERENCED STANDARDS**



Truss Plate Institute
583 D'Onofrio Drive, Suite 200
Madison, WI 53719

Standard reference number	Title	Referenced in code section number
TPI 1—2002	National Design Standards for Metal-Plate-Connected Wood Truss Construction . . .	2303.4, 2306.1, 2314.4.9, 2319.17.2.1.1, 2319.17.2.2.8

Appendix D

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.

Appendix E

FLORIDA ADMINISTRATIVE CODE Chapter 61G15 Rules of the Florida Board of Professional Engineers

CHAPTER 61G15-31.003 Design of Structures Utilizing Prefabricated Wood Trusses.

- (1) When a Structural Engineer of Record and a Delegated Engineer exist as may be determined by applicable Florida law, the apportionment of responsibilities between the Structural Engineer of Record and a Delegated Engineer shall be as set forth in Chapter 2 of ANSI/TPI 1-1995, wherein the Structural Engineer of Record is the Building Designer and the Delegated Engineer is the Truss Designer as those terms are defined in said standard.
- (2) The Structural Engineer of Record shall provide design requirements in writing to the Delegated Engineer and shall review the design documents of the delegated engineer for conformance to his written instructions in accordance with Chapter 61G15-30.005, F.A.C.
- (3) For the purposes of this rule, the following definitions shall apply:
 - (a) "Truss System" shall mean an assemblage of trusses and truss girders, together with all bracing, connections, and other structural elements and all spacing and locational criteria, that, in combination, function to support the dead, live and wind loads applicable to the roof of a structure with respect to a Truss System for the roof, and the floor of a structure with respect to a Truss System for the floor. A Truss System does not include walls, foundations, or any other structural support systems.
 - (b) "Truss System Engineer" shall mean an engineer who designs a Truss System.
 - (c) "Truss Design Engineer" shall mean an engineer who designs individual trusses, but does not design a Truss System.
- (4) An engineer is a Truss System Engineer if he designs a Truss System. Each of the drawings in the Truss System design package for the Truss System shall include a title block bearing the printed name, address, and license number of the Truss System Engineer and the date of the drawing. The design documentation prepared by the Truss System Engineer shall also include a truss placement plan (diagram) for the Truss System, showing the location and designation of each truss. Said design documentation for the Truss System shall be signed and sealed by the Truss System Engineer. The cover or index sheet of the Truss System design package may be signed and sealed in lieu of signing and sealing each individual sheet, provided that the cover or index sheet contains the following information:
 - (a) The name, address and license number of the Structural Engineer of Record, if there is one, and the name, address and license number of the Truss System Engineer.
 - (b) Identification of the project, by address or by lot number, block number, section or subdivision and city or county.
 - (c) Identification of the applicable building code and chapter(s) that the Truss System design is intended to meet, the engineer design criteria relied upon in designing the Truss System and the truss design loading.
 - (d) Identification of any computer program used for engineering the Truss System.
 - (e) An index of the attached Truss System design drawings. The naming and numbering system utilized for the drawings shall be clear as to how many drawings there are in the set and the date and sequence number of each of these drawings shall be included.
- (5) An engineer is a Truss Design Engineer if he designs individual trusses, but does not design the Truss System. Each of the drawings in the truss design package for individual trusses shall include a title block bearing the printed name, address, and license number of the Truss Design Engineer and the date of the drawing. The Truss Design documents prepared by the Truss Design Engineer shall be signed and sealed by the Truss Design Engineer. The cover or index sheet of the truss design package may be signed and sealed in lieu of signing and sealing each individual sheet, provided that the cover or index sheet contains the following information:
 - (a) The name, address and license number of the Structural Engineer of Record, if there is one, and the name, address, and license number of the Truss Design Engineer.

- (b) Identification of the project, by address or by lot number, block number, section or subdivision and city or county.
- (c) Identification of the applicable building code and chapter(s) that the truss design is intended to meet, the engineering design criteria relied upon in designing the trusses and the truss design loading.
- (d) Identification of any computer program used for engineering the trusses.
- (e) An index of the attached truss design drawings. The naming and numbering system utilized for the drawings shall be clear as to how many drawings there are in the set and the date and sequence number of each of these drawings.

FLORIDA ADMINISTRATIVE CODE

Chapter 61G15

Rules of the Florida Board of Professional Engineers

CHAPTER 61G15-18 ORGANIZATION AND PURPOSE

61G15-18.011 Definitions.

As used in Chapter 471 and in these rules where the context will permit the following terms have the following meanings:

(1) "Responsible Charge" shall mean that degree of control an engineer is required to maintain over engineering decisions made personally or by others over which the engineer exercises supervisory direction and control authority.

- (a) The degree of control necessary for an engineer to be in responsible charge shall be such that the engineer:
 - 1. Personally makes engineering decisions or reviews and approves proposed decisions prior to their implementation, including the consideration of alternatives, whenever engineering decisions which could affect the health, safety and welfare of the public are made. In making said engineering decisions, the engineer shall be physically present or, through the use of communication devices, be available in a reasonable period of time.
 - 2. Judges the validity and applicability of recommendations prior to their incorporation into the work, including the qualifications of those making the recommendations.

(b) Engineering decisions which must be made by and are the responsibility of the engineer in responsible charge are those decisions concerning permanent or temporary work which could create a danger to the health, safety, and welfare of the public, such as, but not limited to, the following:

- 1. The selection of engineering alternatives to be investigated and the comparison of alternatives for engineering works.**
- 2. The selection or development of design standards or methods, and materials to be used.**
- 3. The selection or development of techniques or methods of testing to be used in evaluating materials or completed works, either new or existing.**
- 4. The development and control of operating and maintenance procedures.**

- (c) As a test to evaluate whether an engineer is in responsible charge, the following must be considered: An engineer who signs and seals engineering documents in responsible charge must be capable of answering questions relevant to the engineering decisions made during the engineer's work on the project, in sufficient detail as to leave little doubt as to the engineer's proficiency for the work performed. It is not necessary to defend decisions as in an adversary situation, but only to demonstrate that the engineer in responsible charge made them and possessed sufficient knowledge of the project to make them. Examples of questions to be answered by the engineer could relate to criteria for design, methods of analysis, selection of materials and systems, economics of alternate solutions, and environmental considerations. The individuals should be able to clearly define the span and degree of control and how it was exercised and to demonstrate that the engineer was answerable within said span and degree of control necessary for the engineering work done.
- (d) The term "responsible charge" relates to engineering decisions within the purview of the Professional Engineers Act and does not refer to management control in a hierarchy of professional engineers except as each of the individuals in the hierarchy exercises independent engineering judgment and thus responsible charge. It does not refer to administrative and personnel management functions. While an engineer may also have such duties in this position, it should not enhance or decrease one's status of being in responsible charge of the work. The phrase does not refer to the concept of financial liability.

(2) "Engineering Design" shall mean that the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. Central to the process are the essential and complementary roles of synthesis and analysis. This definition is intended to be interpreted in its broadest sense. In particular the words "system, component, or process" and "convert resources optimally" operate to indicate that sociological, economic, aesthetic, legal, ethical, etc., considerations can be included.

(3) The term "evaluation of engineering works and systems" as used in the definition in the practice of engineering set forth in Chapter 471.005(4)(a), F.S., includes but is not limited to services provided by testing laboratories involving the following:

- (a) The planning and implementation of any investigation or testing program for the purpose of developing design criteria either by an engineering testing laboratory or other professional engineers.
- (b) The planning or implementation of any investigation, inspection or testing program for the purpose of determining the causes of failures.
- (c) The preparation of any report documenting soils or other construction materials test data.
- (d) The preparation of any report offering any engineering evaluation, advice or test results, whenever such reports go beyond the tabulation of test data. Reports which document soils or other construction materials test data will be considered as engineering reports.
- (e) Services performed by any entity or provided by a testing laboratory for any entity subject to regulation by a state or federal regulatory agency which enforces standards as to testing shall be exempt from this rule except where the services otherwise would require the participation of a professional engineer.

(4) "Certification" shall mean a statement signed and/or sealed by a professional engineer representing that the engineering services addressed therein, as defined in Section 471.005(6), Florida Statutes, have been performed by the professional engineer, and based upon the professional engineer's knowledge, information and belief, and in accordance with commonly accepted procedures consistent with applicable standards of practice, and is not a guaranty or warranty, either expressed or implied.

(5) "FEMC" shall mean the Florida Engineers Management Corporation, created in Section 471.038(3), Florida Statutes.

CHAPTER 61G15-30 RESPONSIBILITY RULES COMMON TO ALL ENGINEERS

61G15-31.001 General Responsibility.

The engineer of record for a structure is responsible for all structural aspects of the design of the structure including the design of all of the structure's systems and components. As noted herein the engineer of record for a structure may delegate responsibility for the design of a system or component part of the structure to a qualified delegated engineer. In either case the structural documents shall address, as a minimum, the items noted in the following subsections covering specific structural systems or components. Both the engineer of record for the structure and the delegated engineer, if utilized, shall comply with the requirements of the general responsibility rules, and with the requirements of the more specific structural responsibility rules contained herein.

61G15-30.002 Definitions Common to All Engineer's Responsibility Rules.

(1) Engineer of Record. A Florida professional engineer who is in responsible charge for the preparation, signing, dating, sealing and issuing of any engineering document(s) for any engineering service or creative work.

(2) Prime Professional. A Florida professional engineer, or a duly qualified engineering corporation or partnership, who is engaged by the client to provide any planning, design, coordination, arrangement and permitting for the project and for construction observations in connection with any engineering project, service or creative work. The prime professional engineer may also be an engineer of record on the same project.

(3) Delegated Engineer. A Florida professional 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. A delegated engineer usually falls into one of the following categories:

- (a) An independent consultant.
 - (b) An employee or officer of an entity supplying components to a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.
 - (c) An employee or officer of a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.
- (4) Engineering Documents. Engineering documents are designs, plans specifications, drawings, prints, reports, or similar instruments of service in connection with engineering services or creative work that have been prepared and issued by the professional engineer or under his responsible supervision, direction or control.
- (5) Delegated Engineering Documents. Delegated engineering documents are those engineering documents that are prepared by a delegated engineer.
- (6) Public Record. An engineering document is "filed for public record" when said document is presented with the engineer of record's knowledge and consent to any federal, state, county, district, authority, municipal or other governmental agency in connection with the transaction of official business with said agency.
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61G15-30.003 Engineering Document Classification.

Engineers shall legibly indicate their name and business address, on engineering documents. Engineering documents which are issued for preliminary or conceptual use, shall clearly note the intended purpose of such documents. When elements of the project are shown on an engineering document only for information or clarification and the Engineer does not intend to accept responsibility for the elements, the engineer shall clearly note on the documents the extent of his responsibility.

61G15-30.005 Request for and Review of Delegated Engineering Documents.

- (1) An engineer of record who delegates a portion of his responsibility to a delegated engineer is obligated to communicate in writing his engineering requirements to the delegated engineer.
- (2) An engineer of record who delegates a portion of his design responsibility to a delegated engineer shall require submission of delegated engineering documents prepared by the delegated engineer and shall review those documents for compliance with his written engineering requirements and to confirm the following:
 - (a) That the delegated engineering documents have been prepared by an engineer.
 - (b) That the delegated engineering documents of the delegated engineer conform with the intent of the engineer of record and meet the written criteria.
 - (c) That the effect of the delegated engineer's work on the overall project generally conforms with the intent of the engineer of record.

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.



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