Tech Notes SBCA

Position Statement on Sealed TPDs (Truss Placement Diagrams) for Commercial Projects in the State of North Carolina

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Background:

SBCA has written this *Tech Note* to provide some direction on how to handle requests for seals on TPDs (truss placement diagrams). There is much confusion in the market with respect to understanding what a TPD is intended to be and how it is intended to be used. This *Tech Note* will provide background on these concepts and will answer the question of why sealing a TPD may be improper and may even violate professional engineering laws. This *Tech Note* was based on North Carolina's current engineering rules and laws[1], including the *North Carolina Engineering and Land Surveying Act*[2], the *North Carolina Administrative Code and Policies*, and the *2009 North Carolina Building Code (NCBC)*[3]. Refer to Appendix A for further analysis and to Appendix B for important defined terms.

Issue:

The state of North Carolina has recently amended the TPD section of the *2006 International Building Code* for inclusion in the *2009 NCBC* (see Appendix C):

> **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~~ and 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.~~

The *2009 NCBC* specifically requires engineering seals and signatures on TPDs that are prepared for commercial projects. TPDs are sometimes also referred to as truss placement plans, truss layouts, framing plans or framing layouts. If a truss design engineer were to seal a TPD, it has been suggested by the attorney of the North Carolina Board of Professional Engineers that he or she could be inappropriately held responsible for ensuring the proper flow of loads through the truss to the bearing and support structure below the truss, and into the foundation - particularly when the truss design engineer is the only engineer on the job.

The following recommendations should be used to assess all the ramifications of providing seals on a TPD for commercial projects.

Summary of Recommendations and Conclusions:

The current North Carolina engineering rules and laws provide the basis upon which to evaluate the need to provide an engineer's seal on a TPD. Because TPDs are generally created neither by nor under the

[1] For the latest professional engineering law, see the following website: www.ncbels.org/rulesandlaws.html
[2] Chapter 89C of the General Statutes of NC can be viewed online: www.ncbels.org/GS89C8-2000.pdf
[3] The *2009 North Carolina Building Code* is based on the *2006 International Building Code*.

Prepared with assistance from Structural Building Components Association of the Carolinas, a local chapter of SBCA.
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immediate personal supervision of a licensed design professional, they cannot be sealed. Requesting a truss design engineer to seal a non-registered person's work is illegal in North Carolina per the *NCAC* (see Appendix E for the full text).

> NCAC Title 21, Chapter 56, 21-56.0700. Standards of Professional Conduct
> 21-56.0701. Rules of Professional Conduct (c) The licensee... (3) Shall not affix the signature or seal to any engineering ...document not prepared under the licensee's direct supervisory control.

Going well beyond the TPD, North Carolina law recognizes that it would be perfectly appropriate for truss manufacturer personnel to design the trusses without the involvement of an engineer. Chapter §89C-25 of the *North Carolina Engineering and Land Surveying Act* (see Appendix F for the full text) sets forth a manufacturer's exemption for engineering:

> §89C-25. Limitations on application of Chapter. This Chapter shall not be construed to prevent or affect:...(7) The internal engineering….activities of a person, firm or corporation engaged in manufacturing, processing, or producing a product,... or their employees in the course of their employment in connection with the manufacture, installation, or servicing of their product or service in the field, or on the premises maintenance of machinery, equipment, or apparatus incidental to the manufacture or installation of the product...

Based on this evaluation, a TPD does not require a professional engineer's seal. In contrast with both the Professional Engineering Board Rules and the *North Carolina Engineering and Land Surveying Act*, the *2009 NCBC* was revised to require a truss design engineer to provide seals on TPDs. The truss design engineer should always clearly state that the scope of work that accompanies his or her seal and signature is limited to the design of the single truss component depicted on the truss design drawing.

Analysis:

Commercial Construction Documents

In most jurisdictions, the building designer of a non-residential structure must be an RDP (registered design professional), as defined in Appendix B. The terms building designer or RDP hereinafter will be referred to as RDP. This definition is pursuant to the *North Carolina Administrative Code and Policies* (see Appendix D):

> 204.3.5 Design Professional Seal Required. Where the General Statutes require, no permit shall be issued unless the construction documents (drawings and specifications), bear the North Carolina seal of a registered design professional. Construction documents shall include the name and address of the business entity (individual, corporation, or partnership) with whom the registered design professional is affiliated.

The construction documents should in turn clearly define the scope of the work proposed by the RDP pursuant to the *North Carolina Administrative Code and Policies* (see Appendix D):

> 106.2 Drawings and Specifications
> 106.2.1 Requirements. Drawings and specifications, as required by the inspection department, shall be drawn to scale with sufficient clarity and detail to indicate the nature and character of the work and shall accompany the application for a permit. All information, drawings, specifications and accompanying data shall bear the name, address and signature of the person responsible for the design.

In preparing the construction documents, the RDP needs to provide the truss design engineer with the information necessary to properly design the trusses for the building. According to *ANSI/TPI 1-2002*, Chapter 2 (see Appendix G for full text), which is adopted by reference in the *2009 NCBC* (see Appendix C Sections 101.4 and 2303.4.1 and Chapter 35 "Reference Standards") and the *North Carolina Administrative Code and Policies* (see Appendix D Section 101.3.5), the following information should be provided:

> ANSI/TPI 1-2002 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.

Truss Design and Preparation of Truss Design Drawings

Assuming the requisite information is provided within the construction documents issued by the RDP or building designer, the truss design engineer's sole responsibility is to properly design the individual trusses according to this information. Once designed, a truss is then depicted on a truss design drawing. The truss design engineer is therefore specifically responsible for the single truss design depicted on each truss design drawing.

Who Typically Prepares Truss Placement Diagrams?

Assuming the requisite information is provided in the construction documents, TPDs are prepared by truss manufacturer personnel who are not typically truss design engineers. Many times they are the truss manufacturer's salespeople, or individuals who work as truss technicians or truss take-off specialists (truss designers). All of these people are highly trained and skilled in the work they do, but are usually not engineers. Because these TPDs are typically prepared outside the truss designer engineer's scope of work, they might not be reviewed or even seen by the truss design engineer, and are therefore not prepared under the truss design engineer's direct supervision.

Requiring Truss Placement Diagrams to be Sealed Would Violate North Carolina Law

Because TPDs are generally created neither by nor under the immediate personal supervision of a licensed design professional, they cannot be sealed. Requesting a truss design engineer to seal a non-registered person's work is illegal in North Carolina per the *NCAC* (see Appendix E for the full text).

> NCAC Title 21, Chapter 56, 21-56.0700. Standards of Professional Conduct
> 21-56.0701. Rules of Professional Conduct (c) The licensee... (3) Shall not affix the signature or seal to any engineering ...document not prepared under the licensee's direct supervisory control. Direct supervisory control (responsible charge) requires a licensee or employee to carry out all client contacts, provide internal and external financial control, oversee employee training, and exercise control and supervision over all job requirements to include research, planning, design, field supervision and work product review.

Going well beyond the TPD, North Carolina law recognizes that it would be perfectly appropriate for truss manufacturer personnel to design the trusses without the involvement of an engineer. Chapter §89C-25 of the *North Carolina Engineering and Land Surveying Act* (see Appendix F for the full text) sets forth a manufacturer's exemption for engineering:

> §89C-25. Limitations on application of Chapter. This Chapter shall not be construed to prevent or affect:...(7) The internal engineering….activities of a person, firm or corporation engaged in manufacturing, processing, or producing a product,... or their employees in the course of their employment in connection with the manufacture, installation, or servicing of their product or service in the field, or on the premises maintenance of machinery, equipment, or apparatus incidental to the manufacture or installation of the product...

Why are Truss Placement Diagrams Prepared?

TPDs are intended to assist customers, erectors and code enforcement officials in positioning or locating the trusses and related structural components supplied by the component manufacturer. Their function is to serve as detailed installation instructions. They indicate the component manufacturer's assumed location for each truss or related component that has been designed and manufactured.

From this perspective, a truss or related structural building component is no different than a window that is manufactured and in turn installed within a building. A window may be a highly engineered component of a house with specific installation specifications and instructions. However, there is no requirement to provide an engineer's seal on the installation instructions for windows.

Recommendations:

The TPD is **NOT** to be viewed as an engineering document. It is provided by the component manufacturer to assist the installer in properly locating the components within the structure. There is no engineering input provided in the preparation of the TPD. Because TPDs are generally created neither by nor under the direct supervisory control (responsible charge) of a registered design professional (licensee), professional engineering law suggest that they should not be sealed because doing so may be a violation of North Carolina engineering law. Requesting a truss design engineer to seal a non-registered person's work is illegal in North Carolina per the *North Carolina Administrative Code (NCAC)* (see Appendix E for the full text).

> NCAC Title 21, Chapter 56, 21-56.0700. Standards of Professional Conduct
> 21-56.0701. Rules of Professional Conduct (c) The licensee shall perform services only in areas of the licensee's competence and: ... (3) Shall not affix the signature or seal to any engineering ...document not prepared under the licensee's direct supervisory control. Direct supervisory control (responsible charge) requires a licensee or employee to carry out all client contacts, provide internal and external financial control, oversee employee training, and exercise control and supervision over all job requirements to include research, planning, design, field supervision and work product review.

All the necessary truss engineering and analysis for each individual truss that is going to be applied to a building is found on the truss design drawings. According to *ANSI/TPI 1 1-2002* (see Appendix G), which is the standard referenced by the *2009 NCBC* for the construction of metal plate connected wood trusses, the building design, flow of loads through the building, and ensuring that the flow of loads matches the building design concepts are all reserved as responsibilities of the RDP.

If a TPD is provided, it is required that the project's designated RDP review and approve it to ensure that the proper flow of loads through the building have been accounted for per the *2009 NCBC* Section 2303.4.1.4 (see Appendix C):

> 2303.4.1.4 Truss submittal package. ...The submittal package shall be submitted to the project registered design professional for final approval prior to fabrication of trusses.

If a truss design engineer were to seal a TPD, per the *North Carolina Administrative Code (NCAC)*, they should clearly state the scope of work that is included with the seal (see Appendix E for the full text):

> NCAC Title 21, Chapter 56, 21-56.0700. Standards of Professional Conduct
> 21-56.0701. Rules of Professional Conduct (c) The licensee shall perform services only in areas of the licensee's competence and:... (3)...The licensee may affix the seal and signature to drawings and documents depicting the work of two or more professionals provided it is designated by a note under the seal the specific subject matter for which each is responsible.

In this instance, a truss design engineer must, as stated above per North Carolina engineering law, explicitly define what his/her seal means (in terms of the scope of work) when it is placed on the TPD. When this requirement is enforced by local building departments in North Carolina, it is recommended to consider attaching the following sample note, which describes a truss design engineer's scope of work, to any TPD along with the seal of the engineer who is doing the work for the component manufacturer.

> SCOPE OF WORK SAMPLE NOTE
> The truss design engineer's signature on this TPD certifies that the individual truss designs are based on the truss positioning shown. The truss design engineer's seal on the attached truss design drawings indicates acceptance of professional engineering responsibility solely for the

individual truss design drawings shown. The suitability and use of this component for any particular building is the responsibility of the building designer, per ANSI/TPI 1-2002 Chapter 2. No building design or inspection is implied by the seals on the truss design drawings or TPD. Verification that positions, dimensions and loads for each truss matches the construction documents and/or intent is the responsibility of the building designer. The truss design engineer is responsible for the correct application of the specified loading provided to him/her by the building designer and for the truss-to-truss connections. The truss design engineer is NOT responsible for:

- The transfer of lateral load from the roof to the shear walls.
- The connection of trusses to the bearing support.
- The design of the bearing supports.
- Temporary and permanent building restraint/bracing required in the roof and/or floor system.
- The transfer of vertical loads down to the foundation.
- The design of the foundation and soil.
- Analysis of the roof and/or floor diaphragms of the building.
- Connection of roof and/or floor diaphragm to the truss.
- Specifying loading used in the design of the trusses.

The building designer shall ascertain that the loads utilized on the truss design drawings meet or exceed the loading imposed by the building code.

Conclusion:

The current North Carolina engineering rules and laws provide the basis upon which to evaluate the need to provide an engineer's seal on a TPD. Based on the professional engineering law, TPDs do not require a professional engineer's seal unless prepared under the direct supervision of a registered design professional. In contrast with both the Professional Engineering Board Rules and the *North Carolina Engineering and Land Surveying Act*, the *2009 NCBC* was revised to require a truss design engineer to provide seals on TPDs. The truss design engineer should always clearly state that the scope of work that accompanies his or her seal and signature is limited to the design of the single truss component depicted on the truss design drawing.

Appendix B

Key Definitions [4]

TRUSS DESIGN DRAWING: The graphic depiction of an individual truss, which describes the design and physical characteristics of the truss.

TPD (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. The TPD shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the jobsite. TPDs shall not be required to bear the seal or signature of the truss designer.

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. Construction drawings shall be drawn to an appropriate scale.

PRACTICE OF ENGINEERING: (a) Any service or creative work, the adequate performance of which requires engineering education, training, and experience, in the application of special knowledge of the mathematical, physical, and engineering sciences to such services or creative work as consultation, investigation, evaluation, planning, and design of engineering works and systems, planning the use of land and water, engineering surveys, and the observation of construction for the purposes of assuring compliance with drawings and specifications, including the consultation, investigation, evaluation, planning, and design for either private or public use, in connection with any utilities, structures, buildings, machines, equipment, processes, work systems, projects, and industrial or consumer products or equipment of a mechanical, electrical, hydraulic, pneumatic or thermal nature, insofar as they involve safeguarding life, health or property, and including such other professional services as may be necessary to the planning, progress and completion of any engineering services.

(b) The term "practice of engineering" shall not be construed to permit the location, description, establishment or re-establishment of property lines or descriptions of land boundaries for conveyance. The term does not include the assessment of an underground storage tank required by applicable rules at closure or change in service unless there has been a discharge or release of the product from the tank.

REGISTERED DESIGN PROFESSIONAL (RDP): An individual who is registered or licensed to practice his or her respective design profession as defined by the statutory requirements of the professional registration laws of the State of North Carolina.

RESPONSIBLE CHARGE: Direct control and personal supervision, either of engineering work or of land surveying, as the case may be.

Unique Definitions for Structures that require an RDP:

BUILDING DESIGNER: The owner of the building contracts with a registered design professional for the design of the building structural system and responsibility for the construction documents.

TRUSS DESIGN ENGINEER: The individual or organization responsible for the design of trusses. Each individual truss design drawing shall bear the seal and signature of the truss design engineer.

Unique Definitions for Structures that do not require an RDP:

BUILDING DESIGNER: The owner of the building or the individual or organization that contracts with the owner for the design of the building structural system and/or who produces the construction documents.

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

[4] Adapted from *ANSI/TPI 1-2007*, *IBC* Section 106.1, *NCBC* Section 2303.4.1, and the *North Carolina Engineering and Land Surveying Act* Section § 89C-3.

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.

2009 NORTH CAROLINA BUILDING CODE (NCBC)

CHAPTER 1: ADMINISTRATION
SECTION 101: GENERAL

101.4 Referenced codes. The other codes listed in Sections 101.4.1 through 101.4.7 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

SECTION 104: DUTIES AND POWERS OF BUILDING OFFICIAL
104.1 through 104.9 Deleted. See the North Carolina Administrative Code and Policies.
(retain Sections 104.10 and 104.11)

SECTION 105: PERMITS
Deleted. See the North Carolina Administrative Code and Policies.

SECTION 106: CONSTRUCTION DOCUMENTS
Deleted. See the North Carolina Administrative Code and Policies.

CHAPTER 23: WOOD

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 who is a registered design professional.

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.

Each individual truss design drawing shall bear the seal and signature of the truss designer.

2303.4.1.3 TPD. The truss manufacturer shall provide a TPD that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The TPD shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. TPDs shall be required to bear the seal and signature of the truss designer.

2303.4.1.4 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing, the TPD for the project, the truss member permanent bracing specification and, as applicable, the cover sheet/truss index sheet. The submittal package shall be submitted to the project registered design professional for final approval prior to fabrication of trusses.

Chapter 35 REFERENCED STANDARDS

TPI 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

Appendix D

2006 NORTH CAROLINA ADMINISTRATIVE CODE AND POLICIES
CHAPTER 1: ADMINISTRATIVE CODE

101 TITLE AND SCOPE
101.3.2 Technical Codes
101.3.2.1 North Carolina Building Code. The provisions of the Building Code shall apply to the construction, alteration, repair, equipment, use and occupancy, location, movement to another site, removal and demolition, or any appurtenances connected or attached to every building or structure, other than one or two family dwellings and townhouses.

101.3.5 Referenced Standards. Standards referenced in the technical codes shall be considered an integral part of the codes. If specific portions of a standard are denoted by code text, only those specific portions of the standard shall be enforced. Where code provisions conflict with a standard, the code provisions shall be enforced. Permissive and advisory provisions in a standard shall not be construed as mandatory.

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106 PERMITS
106.1 Permit Required. A current permit is required for all work described in the technical codes unless specifically exempted by the North Carolina Statutes or the technical codes.

106.2 Drawings and Specifications

106.2.1 Requirements. Drawings and specifications, as required by the inspection department, shall be drawn to scale with sufficient clarity and detail to indicate the nature and character of the work and shall accompany the application for a permit. All information, drawings, specifications and accompanying data shall bear the name, address and signature of the person responsible for the design.

106.2.2 Additional Data. The inspection department may require details, computations, stress diagrams, or documentation sealed by a registered design professional and other data necessary to describe the construction or installation of a system.

106.2.3 Review and Approval. When the inspection department issues a permit, it shall approve, in writing or by stamp, all sets of drawings and specifications "Reviewed for Code Compliance".

Exception: Nothing in this Section shall require the review and approval of One-and Two-Family Dwelling plans.

CHAPTER 2: POLICIES
203 NORTH CAROLINA DEPARTMENT OF INSURANCE
204 CITY AND COUNTY GOVERNMENT
204.3 PERMITS

204.3.5 Design Professional Seal Required. Where the General Statutes require, no permit shall be issued unless the construction documents (drawings and specifications), bear the North Carolina seal of a registered design professional. Construction documents shall include the name and address of the business entity (individual, corporation, or partnership) with whom the registered design professional is affiliated. Questions concerning this section should be directed to the NC Board of Architecture or the NC Board of Examiners for Engineers and Land Surveyors.

Exceptions: For permitting purposes, the seal of a registered design professional is not required when the building, structure or project involved is in one of the categories listed below, unless otherwise required pursuant to the provisions of the General Statutes or the technical codes.

1. A family residence, up to eight units attached with grade level exit, which is not a part of or physically connected with any other buildings or residential units. More than one such set of attached units on a site is determined to be a complex and will require the seal of a registered design professional;

2. A building upon any farm for the use of any farmer, unless the building is of such nature and intended for such use as to substantially involve the health or safety of the public;

3. An institutional or commercial building if it does not have a total cost of construction exceeding ninety thousand dollars ($90,000);

4. An institutional or commercial building if the total building area does not exceed 2,500 square feet in gross floor area;

5. Alteration, remodeling, or renovation of an existing building that is exempt under this section, or alteration, remodeling, or renovation of an existing building or building site that does not alter or affect the structural system of the building; change the building's access or exit pattern; or change the live or dead load on the building's structural system. This subdivision shall not limit or change any other exemptions to this Chapter or to the practice of engineering under Chapter 89C of the General Statutes.

6. The preparation and use of details and shop drawings, assembly or erection drawings, or graphic descriptions utilized to detail or illustrate a portion of the work required to construct the project in accordance with the plans and specifications prepared or to be prepared under the requirements or exemptions of this Chapter.

7. Nothing in this Chapter shall be construed to prevent any individual from making plans or data for buildings for himself. This exemption does not apply to plans for church structures.

204.3.5.1 Registered Design Professional. The registered design professional shall be a registered architect, licensed professional engineer or NICET Level III sprinkler designer legally registered or licensed under the laws of this State.

Appendix E

BOARD RULES
NORTH CAROLINA ADMINISTRATIVE CODE (NCAC)
Title 21, Chapter 56
BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS
WITH REVISIONS EFFECTIVE AUGUST 1, 2002[5]

21-56.0700. STANDARDS OF PROFESSIONAL CONDUCT
21-56.0701. RULES OF PROFESSIONAL CONDUCT

(a) In order to safeguard the life, health, property and welfare of the public and to establish and maintain a high standard of integrity, skills, and practice in the professions of engineering and land surveying, the following rules of professional conduct are promulgated in accordance with G.S. 89C-20 and shall be binding upon every person holding a certificate of licensure as a Professional Engineer or Professional Land Surveyor (licensee), and on all business entities authorized to offer or perform engineering or land surveying services in this state.

All persons licensed under the provisions of Chapter 89C of the General Statutes are charged with having knowledge of the existence of the rules of professional conduct, and shall be deemed to be familiar with their several provisions and to understand them.

(b) The licensee shall conduct the practice in order to protect the public health, safety and welfare. The licensee shall at all times recognize the primary obligation to protect the public in the performance of the professional duties. If the licensee's engineering or land surveying judgment is overruled under circumstances where the safety, health and welfare of the public are endangered, the licensee shall inform the employer, the contractor and the appropriate regulatory agency of the possible consequences of the situation.

(c) The licensee shall perform services only in areas of the licensee's competence and:

(1) Shall undertake to perform engineering and land surveying assignments only when qualified by education or experience in the specific technical field of professional engineering or land surveying involved.

(2) May accept an assignment or project requiring education or experience outside of the licensee's own field of competence, but only to the extent that the services are restricted to those portions or disciplines of the project in which the licensee is qualified. All other portions or disciplines of such project shall be performed by associates, consultants, or employees who are licensed and competent in those portions or disciplines.

(3) Shall not affix the signature or seal to any engineering or land surveying plan or document dealing with subject matter for which the licensee lacks competence by virtue of education or experience, nor to any such plan or document not prepared under the licensee's direct supervisory control. Direct supervisory control (responsible charge) requires a licensee or employee to carry out all client contacts, provide internal and external financial control, oversee employee training, and exercise control and supervision over all job requirements to include research, planning, design, field supervision and work product review. A licensee shall not contract with a non-licensed individual to provide these professional services. Research, such as title searches and soil testing, may be contracted to a non-licensed individual, provided that individual is qualified or licensed to provide such service and provided the licensee reviews the work. The licensee may affix the seal and signature to drawings and documents depicting the work of two or more professionals provided it is designated by a note under the seal the specific subject matter for which each is responsible.

(d) The licensee shall issue public statements only in an objective and truthful manner and:

[5] www.ncbels.org/CHAPTER21.pdf

(1) Shall be objective and truthful in all professional reports, statements or testimony. The licensee shall include all relevant and pertinent information in such reports, statements or testimony.

(2) When serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion only when it is founded upon adequate knowledge of the facts in issue, upon a background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of the licensee's testimony.

(3) Shall issue no statements, criticisms, or arguments on engineering or land surveying matters connected with public policy which are inspired or paid for by an interested party, or parties, unless the licensee has prefaced the comment by explicitly identifying the licensee's name, by disclosing the identities of the party or parties on whose behalf the licensee is speaking, and by revealing the existence of any pecuniary interest the licensee may have in the instant matters.

(4) Shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice or employment of another engineer or land surveyor, nor indiscriminately criticize another engineer or land surveyor's work in public. Indiscriminate criticism includes statements without valid basis or cause or that are not objective and truthful or that fail to include all relevant and pertinent information. If the licensee believes that another engineer or land surveyor is guilty of misconduct or illegal practice, such information shall be presented to the North Carolina Board of Examiners.

(e) The licensee shall avoid conflicts of interest and:

(1) Shall promptly inform the employer or client and any reviewing agency of any business association, interests, or circumstances which could influence judgment or the quality of services.

(2) Shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties.

(3) Shall not solicit or accept financial or other valuable considerations from material or equipment suppliers for specifying their products.

(4) Shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or other parties dealing with the client or employer in connection with work for which the licensee is responsible.

(5) When in public service as a member, advisor, or employee of a governmental body or department, shall not participate in considerations or actions with respect to services provided by the licensee or the licensee's organization in private engineering and land surveying practices.

(6) Shall not solicit or accept an engineering or land surveying contract from a governmental body on which a principal or officer of the licensee's organization serves as a member.

(7) Shall not attempt to supplant another engineer or land surveyor in a particular employment after becoming aware that the other has been selected for the employment.

(f) The licensee shall solicit or accept work only on the basis of qualifications and:

(1) Shall not offer to pay, either directly or indirectly, any commission, political contribution, gift, or other consideration in order to secure work, exclusive of securing salaried positions through employment agencies.

(2) Shall compete for employment on the basis of professional qualification and competence to perform the work. The licensee shall not solicit or submit proposals for professional services containing a false, fraudulent, misleading, deceptive or unfair statement or claim regarding the cost, quality or extent of services to be rendered.

(3) Shall, with regard to fee bidding on public projects, comply with the provisions of G.S. 143-64.31 et seq., (or for federal projects, the Brooks Act, 40 U.S. Code 541 et seq.) and shall not knowingly cooperate in a violation of any provision of G.S. 143-64.31 et seq. (or of 40 U.S. Code 541 et seq.)

(4) Shall not falsify or permit misrepresentation of academic or professional qualifications and shall only report educational qualifications when a degree or certificate was awarded, unless it is clearly stated that no degree or certificate was awarded. The licensee shall not misrepresent degree of responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint ventures, or past accomplishments with the intent and purpose of enhancing qualifications and work.

(g) The Licensee shall perform services in an ethical and lawful manner and:

(1) Shall not knowingly associate with or permit the use of the licensee's name or firm name in a business venture by any person or firm which the licensee knows, or has reason to believe, is engaging in business or professional practices of a fraudulent or dishonest nature or is not properly licensed.

(2) If the licensee has knowledge or reason to believe that another person or firm may be in violation of any of these provisions or of the North Carolina Engineering and Land Surveying Act, shall present such information to the Board in writing and shall cooperate with the Board in furnishing such further information or assistance as may be required by the Board. The licensee shall timely respond to all inquiries and correspondence from the Board and shall timely claim correspondence from the U. S. Postal Service, or other delivery service, sent to the licensee from the Board.

(h) A Professional Engineer or Professional Land Surveyor who has received a reprimand or civil penalty or whose professional license is revoked, suspended, denied, or surrendered as a result of disciplinary action by another jurisdiction shall be subject to discipline by the Board if the licensee's action constitutes a violation of Chapter 89C of the North Carolina General Statutes or the rules adopted by the Board.

Appendix F

North Carolina Engineering and Land Surveying Act
GENERAL STATUTES OF NORTH CAROLINA
CHAPTER 89C: ENGINEERING AND LAND SURVEYING[6]

§ 89C-25. Limitations on application of Chapter.
This Chapter shall not be construed to prevent or affect:
(1) The practice of architecture, landscape architecture, or contracting or any other legally recognized profession or trade.

(2) The practice of professional engineering or land surveying in this State or by any person not a resident of this State and having no established place of business in this State when this practice does not aggregate more than 90 days in any calendar year, whether performed in this State or elsewhere, or involve more than one specific project; provided, however, that the person is licensed to practice the profession in the person's own state or country, in which the requirements and qualifications for obtaining a certificate of licensure are satisfactory to the Board; in which case the person shall apply for and the Board will issue a temporary permit.

(3) The practice of professional engineering or land surveying in this State not to aggregate more than 90 days by any person residing in this State, but whose residence has not been of sufficient duration for the Board to grant or deny licensure; provided, however, the person shall have filed an application for licensure as a professional engineer or professional land surveyor and shall have paid the fee provided for in G.S. 89C-14, and provided that the person is licensed to practice professional engineering or professional land surveying in t he person's own state or country in which the requirements and qualifications for obtaining a certificate of licensure are satisfactory to the Board, in which case the person shall apply for and the Board will issue a temporary permit.

(4) Engaging in engineering or land surveying as an employee or assistant under the responsible charge of a professional engineer or professional land surveyor or as an employee or assistant of a nonresident professional engineer or a nonresident professional land surveyor provided for in subdivisions (2) and (3) of this section, provided that the work as an employee may not include responsible charge of design or supervision.

(5) The practice of professional engineering or land surveying by any person not a resident of, and having no established place of business in this State, as a consulting associate of a professional engineer or professional land surveyor licensed under the provisions of this Chapter; provided, the nonresident is qualified for performing the professional service in the person's own state or country.

(6) Practice by members of the armed forces or employees of the government of the United States while engaged in the practice of engineering or land surveying solely for the government on government-owned works and projects; or practice by those employees of the Natural Resources Conservation Service having federal engineering job approval authority that involves the planning, designing, or implementation of best management practices on agricultural lands.

(7) The internal engineering or surveying activities of a person, firm or corporation engaged in manufacturing, processing, or producing a product, including the activities of public service corporations, public utility companies, authorities, State agencies railroads, or membership cooperatives, or the installation and servicing of their product in the field; or research and development in connection with the manufacture of that product or their service; or of their research affiliates; or their employees in the course of their employment in connection with the manufacture, installation, or servicing of their product or service in the field, or on the premises maintenance of machinery, equipment, or apparatus incidental to the manufacture or installation of the product or service of a firm by the employees of the firm upon property owned, leased or used by the firm; inspection, maintenance and service work done by employees of the State of North Carolina, any political subdivision of the State, or any municipality including construction, installation, servicing, maintenance by regular full time

[6] www.ncbels.org/GS89C8-2000.pdf

employees of streets, street lighting, traffic -control signals, police and fire alarm systems, waterworks, steam, electric and sewage treatment and disposal plants; the services of superintendents, inspectors or foremen regularly employed by the State of North Carolina or any political subdivision of the State or a municipal corporation; provided, however, that the internal engineering or surveying activity is not a holding out to or an offer to the public of engineering or any service thereof as prohibited by this Chapter. Engineering work, not related to the foregoing exemptions, where the safety of the public is directly involved shall be under the responsible charge of a licensed professional engineer, or in accordance with standards prepared or approved by a licensed professional engineer.

(8) The (i) preparation of fire sprinkler planning and design drawings by a fire sprinkler contractor licensed under Article 2 of Chapter 87 of the General Statutes, or (ii) the performance of internal engineering or survey work by a manufacturing or communications common carrier company, or by a research and development company, or by employees of those corporations provided that the work is in connection with, or incidental to products of, or nonengineering services rendered by those corporations or their affiliates.

(9) The routine maintenance or servicing of machinery, equipment, facilities or structures, the work of mechanics in the performance of their established functions, or the inspection or supervision of construction by a foreman, superintendent, or agent of the architect or professional engineer, or services of an operational nature performed by an employee of a laboratory, a manufacturing plant, a public service corporation, or governmental operation.

(10) The design of land application irrigation systems for an animal waste management plan, required by G.S. 143-215.10C, by a designer who exhibits, by at least three years of relevant experience, proficiency in soil science and basic hydraulics, and who is thereby listed as an Irrigation Design Technical Specialist by the North Carolina Soil and Water Conservation Commission.

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.

Prepared with assistance from Structural Building Components Association of the Carolinas, a local chapter of SBCA.
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