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Signing and Sealing Engineering and Surveying Documents and BIM Projects

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The Board Website at www.ncbels.org

Key reference source for all materials and requirements for engineering and surveying in North Carolina is the Board's website at: www.ncbels.org as linked under:

Rules/Laws,

Policies/Guidelines and

Newsletters/Articles.

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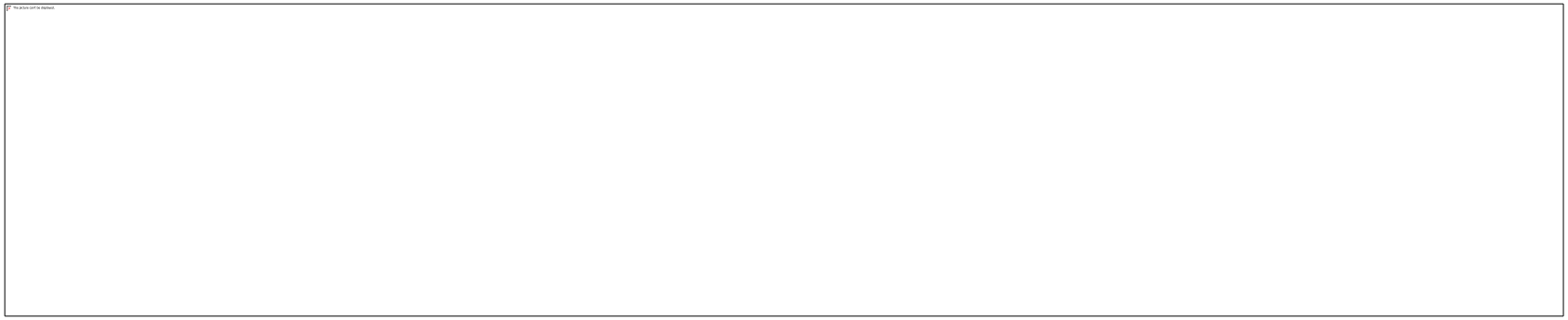
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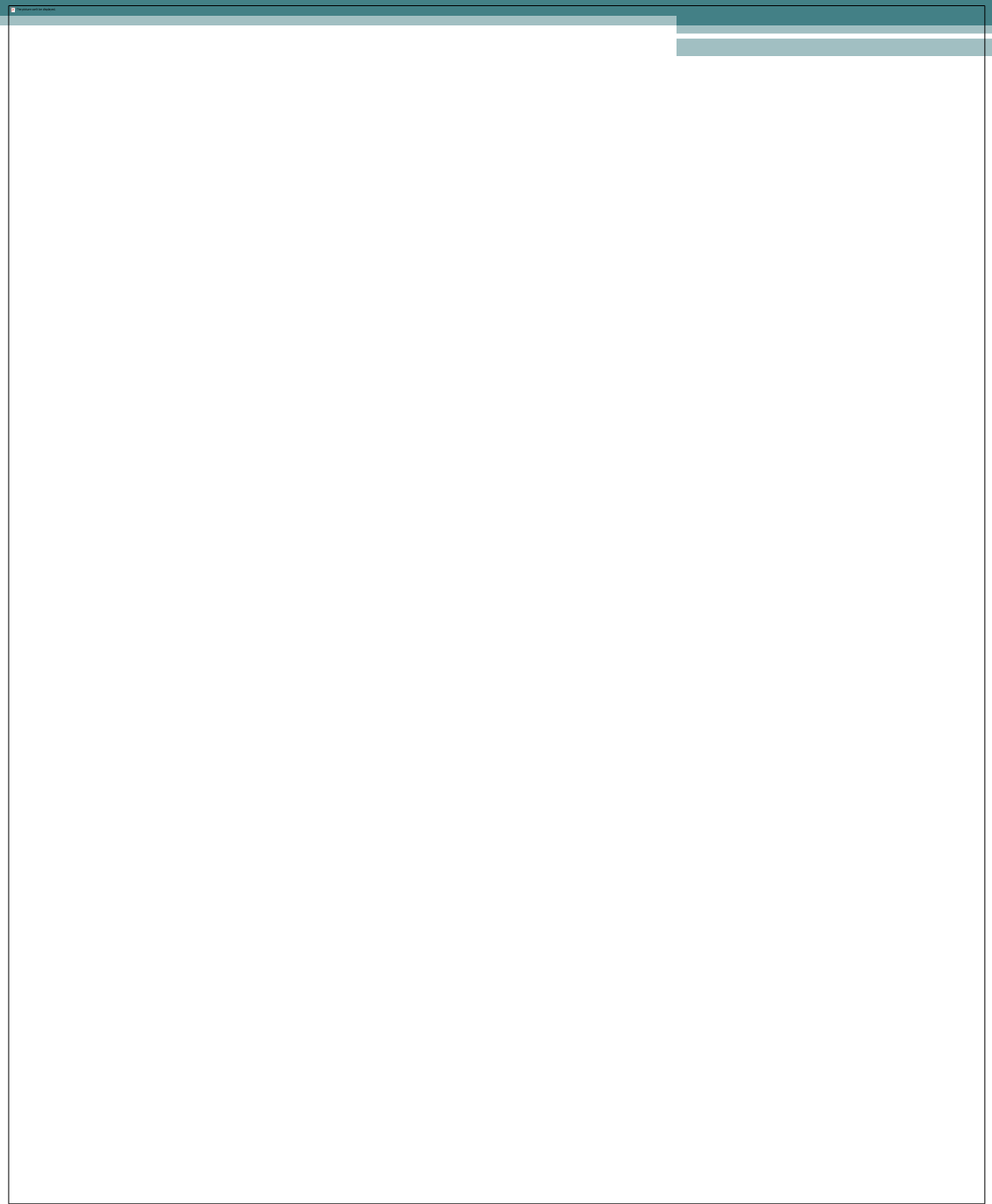
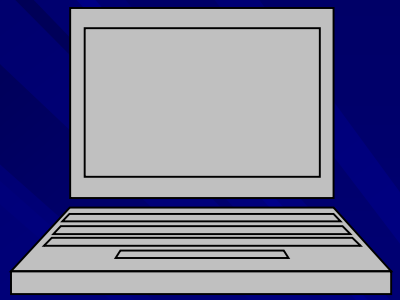


Regulation of the Practice

www.ncbels.org Rules and Laws

- NCGS 89C – The Statute
- NCAC Title 21 Chapter 56 – The Rules in the NC Administrative Code

Policies/Guidelines



http://www.ncbels.org/policies.html

Policies explain a Board application of the Statutes or Rules, often in response to repeated questions.

The Guidelines give assistance from the Board to provide education on a topic, typically generated by the Board when a need is seen to further educate on an area of practice.

Articles

- *To Sign, or Not...*

  By David S. Tuttle, Board Counsel
  http://www.ncbels.org/newsletters/Spring2011.pdf
- *Certifying Record Drawings*

  By David S. Tuttle, Board Counsel
  http://www.ncbels.org/forms/certifyingrecorddrawings.pdf

To Sign, or Not...

By David S. Tuttle, Board Counsel

...to sign? That is one of the questions. Beyond that, when and how you, as a licensee, sign raises questions about facsimile signatures and also about electronic or digital signatures.

Spring 2011 Newsletter
http://www.ncbels.org/newsletters/Spring2011.pdf

Certifying Record Drawings
By David S. Tuttle, Board Counsel

Not only is it acceptable to indicate the source of the information and disclaim any verification by the PE, but it is required by the Board to avoid the appearance that the PE personally observed or verified the changes. The purpose of the drawing should be stated by using the title "Record Drawing" and/or clearly noting somewhere on the drawing. Language disclaiming field verification by the PE of the changes is acceptable. If different PE, see Board Rule .1103(c)(7).

Article listed under Newsletters
http://www.ncbels.org/forms/certifyingrecorddrawings.pdf

Where we're going!

- RULES OF PROFESSIONAL CONDUCT
- RULES FOR SEALING DOCUMENTS
  - Containing engineering or surveying knowledge, analysis, judgment or recommendations
- ELECTRONIC TRANSMITTAL
  - Examples
- Other Project Delivery Methods

STANDARDS FOR CERTIFICATION

21 NCAC 56 (Board Rules)

.0700 Standards of Professional Conduct

.1100 Signing and sealing documents

Competency and Responsible Charge

Board Rule .0701(c)(3)

(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.

Successor Professional

Board Rule .0701(c)(4)

(4) In circumstances where a licensee in responsible charge of the work is unavailable to complete the work, or the work is a design plan signed and sealed by an out-of-jurisdiction licensee (not a site adaptation of a standard design plan under Rule 21 NCAC 56 .1106) a successor licensee may take responsible charge by performing and documenting all professional services to include developing a design file including work or design criteria, calculations, code research, and any necessary and appropriate changes to the work.

Successor Professional

Board Rule .0701(c)(4) [continued]

The non-professional services, such as drafting, need not be redone by the successor licensee but must distinguish in a clean and obvious manner and accurately reflect the successor licensee's work. The burden is on the successor licensee to show such compliance. The successor licensee shall have control of and responsibility for the work product and the signed and sealed originals of all documents.

Sealing

Multiple Seals – Delineating Work

Board Rule .0701(c)(3) cont'd.

…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.

Sealing

Seal – NCAC 21-56.1100 (Board Rules)

Board Rule .1101

It is misconduct for a Professional Engineer or Professional Land Surveyor to seal work done by another individual unless the work is performed under the "responsible charge" of the Professional Engineer or Professional Land Surveyor.

Seal – NCAC 21-56.1100 (Board Rules)

Board Rule .1103 Standard Certification Requirements

(a) Certification of Final Drawings
(b) Certification of Specifications and Reports
(c) Exceptions to Required Certification

.1103(a) Certification of Final Drawings

Drawings or maps not conforming to paragraph (c) shall conform to the following:

1) Certification is required on reproducibles or original drawings;

(2) The seal may be a rubber stamp, embossed seal, computer-generated seal, or other facsimile that becomes a permanent addition to a plan sheet or map;

.1103(a) Certification of Final Drawings

(3) The licensee's written signature must be placed over, or near, the seal on the original document. **A facsimile signature is not acceptable**;

(4) The date of signing must be annotated on the original document;

(5) All sheets of engineering and surveying drawings must be sealed;

.1103(a) Certification of Final Drawings

(6) The name, address and license number of the licensee's firm shall be included on each sheet of engineering drawings. For surveys, the licensee's name, address and license number of the licensee's firm shall be included on the first sheet of the survey or title sheet The individual license number of the sole proprietor shall be used as the license number for an exempt sole proprietorship that meets the requirements of 21 NCAC 56 .0802(b)(1); and

.1103(a) Certification of Final Drawings

(7) Any revision on a drawing after a licensee's certification is affixed shall be noted and dated and if not done under the responsible charge of the same licensee shall be separately certified.

.1103(b) Certification of Specifications and Reports

All specifications, reports, or other documents, including letter reports and calculations, not conforming to paragraph (c) shall conform to the following:

1) Certification is required on original specifications, reports, or other documents, including letter reports and calculations;

(2)The seal may be a rubber stamp, or other facsimile;

.1103(b) Certification of Specifications and Reports

(3)The licensee's written signature must be placed over, or near, the seal on the original document. **A facsimile signature is not acceptable**;

(4)The date of signing must be annotated on the original document;

1103(b) Certification of Specifications and Reports

(5) The title sheet of engineering specifications or other reports must be certified and bear the name, address and license number of the licensee's firm. The title sheet of any survey report or written description of property shall include the name, address and license number of the licensee's firm. The individual license number of a sole proprietor shall be used as the license number for an exempt sole proprietorship that meets the requirements of 21 NCAC 56 .0802(b)(1); and

1103(b) Certification of Specifications and Reports

(6) Any revision in the document after a licensee's certification is affixed shall be described and dated and if not done under the responsible charge of the same licensee shall be separately certified.

1103(b) Certification of Specifications and Reports

(5) The title sheet of engineering specifications and other reports must be certified and bear the name, address and license number of the licensee's firm. The title sheet of any survey report or written description of property shall include the name, address and license number of the licensee's firm; and

(6) Any revision in the document after a licensee's certification is affixed shall be described and dated and if not done under the responsible charge of the same licensee shall be separately certified.

Letters, reports, calculations, emails

Any document that conveys any engineering or surveying knowledge, analysis, judgment or recommendations must be signed and sealed.

Emails – Only current way is to scan and attach a copy of a signed and sealed document, unless it is sent in an authentication process as discussed later.

.1103(c) Exceptions to Required Certification

The seal of a licensee on a map, drawing, plan, specification, plat, document, or report shall signify that it is the final work of the licensee unless the work is stamped or clearly marked substantially as follows so as to put the public on notice not to use as a final product, **in which case certification is optional**:

Exceptions to Required Certification

(1) “Preliminary - Do not use for construction";

(2) "Progress Drawings - Do not use for construction";

(3) "Preliminary Plat - Not for recordation, conveyances, or sales";

(4) "Final Drawing - Not released for construction";

(5) "Final Drawing - For Review Purposes Only";

(c) Exceptions to Required Certification

(6) "Not a Certified Document – This document originally issued and sealed by (name of licensee), (license number), on (date of sealing). This document shall not be considered a certified document";

(7) "Not a Certified Document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by (name of licensee), (license number), on (date of sealing). This document is only certified as to the revisions".

Certification

Unless otherwise indicated by a “preliminary” type statement, certification = final work product.

- Public should be able to rely upon it, once issued.

  Can’t use the “it was only meant for…” excuse.
- Can’t retract certification after issuance.

  If there is a problem notify the appropriate parties. Issue revision to remedy.
- Can’t reissue final work as preliminary to limit its use.

Electronically transmitted documents

.1103 (d)
.1103 (e)
.1103 (f)

.1103(d) Electronically transmitted documents

Documents, including drawings, specifications and reports, that are transmitted electronically beyond the direct control of the licensee shall have the computer-generated seal removed from the original file, unless signed with a digital signature as defined in Paragraph (e) of this Rule. *After removal of the seal the electronic media shall have the following inserted in lieu of the signature and date: This document originally issued and sealed by (name of sealer), (license number), on (Date of sealing). This medium shall not be considered a certified document.*

.1103(d) Electronically transmitted documents (cont'd)

The scanned digital files of properly certified documents are not subject to the requirements of this paragraph. The electronic transmission of CAD, vector or other files subject to easy editing are subject to the requirements of this paragraph. Easy editing is based on the file consisting of separate elements that can be individually modified or deleted.

.1103(e) & (f) Electronically transmitted documents

Authentication process for use of digital (electronic) signature. Not to be confused with a digitized signature.

Electronic signature: An electronic signature, or eSignature, is an electronic indication of intent to agree to or approve the contents of a document. More specifically, the NCUETA and the U.S. Federal ESIGN Act defines an electronic signature as an "electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record."

Digital signature: A digital signature is one form of electronic signature, and it refers to a specific technology. Digital signatures use asymmetric cryptography specifically to enable users to ensure the authenticity of the signer and to trust that a signature is valid through the use of a public and private key pair.

.1103(e) Documents to be electronically transmitted that are signed using a digital signature, shall contain the authentication procedure in a secure mode and a list of the hardware, software and parameters used to prepare the document(s). Secure mode means that the authentication procedure has protective measures to prevent alteration or overriding of the authentication procedure.

.1103(e) (cont'd) The term "digital signature" shall be an electronic authentication process that is attached to or logically associated with an electronic document. The digital signature shall be:

(1) Unique to the licensee using it;

(2) Capable of verification;

(3) Under the sole control of the licensee; and

(4) Linked to a document in such a manner that the digital signature is invalidated if any data in the document is changed.

.1103(f) A digital signature that uses a process approved by the Board will be conclusive that it meets the criteria set forth in (e) (1) through (4) above. The licensee shall confirm that if another process is used, that it meets the criteria.

Adobe Website Explanation of Digital Signature

https://acrobat.adobe.com/us/en/sign/capabilities/digital-signatures-faq.html

What are digital signatures?

Digital signatures are the most advanced and secure type of online signature. You can use them to comply with the most demanding legal and regulatory requirements because they provide the highest levels of assurance about each signer's identity and the authenticity of the documents they sign.

Digital signatures use a certificate-based digital ID issued by an accredited Certificate Authority (CA) or Trust Service Provider (TSP) so when you digitally sign a document, your identity is uniquely linked to you, the signature is bound to the document with encryption, and everything can be verified using underlying technology known as Public Key Infrastructure (PKI).

Three Levels of Signing an Electronic Document

1. Digitized signature
2. Self certifying
3. Signature verified (required by Board Rules)

1. Apply a basic ink signature to a PDF file (digitized signature)

Many documents require just a digital image of your signature. Using Acrobat, you can quickly sign documents electronically by creating and using a stamp with a digital scan of your signature. If you use a drawing tablet with a digital pen, you can also add a simple handwritten signature anywhere in a PDF file using the Apply Ink Signature tool.

2. Create your own digital ID to self-sign documents (self certifying)

To send and receive documents with confidence among trusted colleagues or business partners, Acrobat X lets you digitally sign documents with a free digital ID you create. Recipients can then validate your signature and easily determine if the document has been altered in any way since you signed it.

3. Apply digital signatures verified by third parties (to meet the Board's Rules)

Many business transactions, including financial and legal transactions, require formal verification of a document's integrity and the identity of all signers. Acrobat X enables such verification through powerful encryption and public key infrastructure (PKI) support. Using Acrobat, you can sign and certify PDF files using a higher assurance digital signature verified by a trusted third-party certificate authority through the purchase of a digital ID. Recipients can then use Acrobat or free Adobe Reader software to validate the authenticity of signed documents with certificate authorities.

Anyone can use free Adobe Reader software to view PDF files, validate digital signatures, and verify document certification. The encryption and signature verification is available from many software providers.

Example of Authentication Software as Applied to a Document and as Received and Verified

Another Example of Authentication Software as Applied to a Document and as Received and Verified

ELECTRONIC SUBMITTALS

Several counties are accepting electronic transmittal of plats for recording, with additional counties coming online. Process was overseen by the Office of the NC Secretary of State in coordination with the Board Rules.

Plan submittals for permit application review are being allowed under a process developed jointly by the City of Raleigh (Jim Tschupp, AIA) and Charlotte/Mecklenburg County (James N. Bartl, AIA). A committee assisted in assuring compliance with the Board Rules. The process was also reviewed by the Board of Architecture and the Board of Landscape Architects. Pilot projects in Charlotte in Building Information Modeling (BIM) have resulting in the BIM Digital Signing Guidelines.

Other Project Delivery Systems

IPD (Integrated Project Delivery)

- Is the entity licensed?

BIM (Building Information Modeling)

- How certify?
- How delineate responsibility?
- How control or document revisions by others?
- What are the contract documents?

Building Imaging Modeling (BIM) Use on Projects Guidelines

(These guidelines are in effect as of January 1, 2019 and will be reviewed for any revisions after the NCEES Guidelines are issued in final form.)

This document is <u>intended to offer guidance</u> to Professional Engineers and Professional Land Surveyors (hereinafter "licensees") and their firms that are practicing in North Carolina who wish to use a Building Information Modeling execution plan. This guidance may also apply to any project delivery method employing three dimensional modeling software to virtually construct all building components by a collaborative team based process from design start to construction completion.

Definitions

- Building information model or modeling (BIM): Model-based technology linked with a database of project information, using multidimensional, real-time dynamic modeling software, to plan construction. The model encompasses at least geometry, spatial relationships, geographic information, and quantities and properties of components.

- Execution plan: A document prepared and mutually agreed to by the project team that clearly defines an overall vision for BIM use and implementation details, including but not limited to roles, responsibilities, actions, and interactions of the team and any external parties (such as building code officials, other permitting authorities, software systems to be followed, technology infrastructure needs, process maps, deliverables to be provided, Documents to be produced, intellectual property control, model use, archiving, BIM model ownership, and turnover process to owner at project completion). The execution plan should clearly define the scope and responsible charge of all design professionals and model managers to the extent possible.

A. Use of BIM Project Execution Planning Guide

The project team should prepare a specific execution plan for any project using a BIM model. The referenced planning guide provides an overview of how to prepare such a plan including content and structure. Section B below contains recommended minimum topics to include in an execution plan, which is typically referenced in project contract sections related to engineering, procurement, and construction delivery.

B. Minimum topics to include in project-specific execution plan

Each project (e.g., building, bridge, road, power plant) is unique in terms of configuration, complexity, and development timeline. Similarly, the extent of BIM's use on a project will be different and interrelated with the project delivery method (such as integrated project delivery, design/build, or design/bid/build). This section addresses topics which are important to the successful use of BIM capabilities and products.

C. Sign-and-seal deliverables

At a point in project development agreed to by the owner's team and per the owner's agreement with the project team members, the licensee shall affix a seal/signature to only that part of the products from the BIM model for which he or she is responsible as stated in the Board Rules. A digital archive of the design professional's final product at the completion of each project phase shall be retained in the BIM model archives.

Construction

A. Professional review of others' documents. When the licensee is required by the owner's agreement to review the contractor's drawings (shop drawings) for general conformance with the plans and specifications, the review by the licensee shall not constitute taking of responsibility for the documents and the licensee shall sign and seal, disclaiming that it is only as to general conformance with the plans and specifications unless they were prepared under the responsible control of the licensee as set forth in 21 NCAC 56.0701(c)(3). .

Construction

B. Changes during construction. It is recognized that the owner's full design team will work with a mix of professionally sealed information sets, as well as other model information, inputted by other project team members. When changes occur in the construction strategy that are deemed significant enough to require supplemental documents from the design professionals regardless of type, the professional may rely on the information from others in the model (including the contractor's team), so long as the professional clearly indicates the modifications made, his/her responsibility for it and seals only his/her work.

NCEES Task Force

- The NCEES *Draft Guidelines for Project Use of Building Information Modeling* document goes a long way towards addressing the management of all BIM projects with its requirement for an "execution plan" that is referred to as the "Project Execution Planning Guide."
- Anticipate Final Document in Fall 2020 as Guidelines or Model Rule.

QUESTIONS