Policy Advisory Request No. 50

Re: Proposed Response to Request for Policy Advisory Request Regarding the Ability to Sign and Seal Modifiable Electronic Engineering Plans

The Texas Board of Professional Engineers and Land Surveyors Policy Advisory Opinion Committee (Committee) met in public session on November 18, 2020, and approved this draft response for solicitation of public comment through the Texas Register and Board's website to the referenced request dated February 25, 2019. Any comments on this draft should be submitted to the Board no later than January 18, 2020 via U.S. Mail to Texas Board of Professional Engineers and Land Surveyors, Attn: Michael Sims; 1917 S. Interstate 35; Austin, Texas 78741-3702 or via e-mail to pao@pels.texas.gov

Request:
Mr. Guillermo Guerrero, P.E. with Burns & McDonnell seeks guidance on the following issues:

1. Does the Board consider digital model-based systems as a form of electronic engineering work?
2. Can a digital model-based system be used to replace in its entirety, or supplement in part, a paper-based system?
3. For digital model-based systems, can sealing requirements be satisfied by sealing the Transmittal sheet used to transmit the model?

Background:
The Policy Advisory Opinion process allows the Board to issue interpretations of the Texas Engineering Practice Act (the Act) and Board Rules to address specific questions. Consistent with the requirements of the Texas Engineering Practice Act, Subchapter M, relating to Advisory Opinions, the Committee reviewed this request and determined to accept it as Policy Advisory Opinion on May 23, 2019. The Committee directed Board staff to further study the issues in the request and form a workgroup to gather stakeholder input. The workgroup consisted of approximately 20 individuals and met three times in January, July, and November 2020. Based on feedback from the workgroup, the following response is proposed.

Response:
The answer to the first two questions is addressed in the Act. The Board does consider digital model-based systems to fall under the definition of the practice of engineering as found in Section 1001.003 of the Act, relating to the Practice of Engineering. Since the Act is silent on the exact format engineering work takes, a digital model-based system is an acceptable method to transmit engineering work, as is a paper-based system. Digital models should be signed and sealed as any other engineering work should be.

The third question is not clearly addressed by the Act or Board rules. The current signing and sealing rules were written with traditional paper or PDF type files in mind, not a large electronic file or digital model. The current rules do not specifically address the methodology to seal a large, modifiable file or set of files. The Board recognizes that there are many electronic programs or packages used to generate models, files, or other digital engineering work and that technology changes very quickly. It is also not the role of the Board to endorse or require any specific software package or vendor as part of its rules or policies. Therefore, the Board offers the following performance standards to consider when sealing and transmitting a large electronic file.

When transmitting a file or software package as the engineering work product, the engineer shall ensure the file meets the following criteria, each of which will be discussed in more detail below:

- The design professional's identity is clearly indicated and confirmable.
- The version of the file being sealed is identified and saved.
- All responsible parties and design professionals are clearly identified.

- Consideration has been given to address tracking of modifications.

The Design Professional's Identity is Indicated and Confirmable

The purpose of an engineer's signature and seal is to convey to all parties that the work product is final, compliant with all applicable regulations and codes, and has been created in a manner consistent with generally accepted principles of the engineering profession. Further, the signature and seal communicates that the sealed work product was done either by the sealing engineer or under his or her direct supervision. Lastly, the engineer's seal provides a unique identifier that allows interested parties to identify and locate the design professional when needed. Ideally, the signature and seal will be embedded somewhere in the electronic file itself. However, we understand that such a process may not be readily available with many engineering design software packages. If you are unable to embed a seal and signature, a transmittal sheet that is signed and sealed that notates the unique version of the model that is being sealed is an acceptable alternative until such time the software allows the embedding of seal and signature.

Version Control

If you decide to transmit an electronic file as your engineering work product, care must be taken to be able to readily identify the exact version of the file that is being signed and sealed. Possible methods to identify the signed and sealed version include notating the date and time the sealed file was saved, the file size, a unique version number or through other security methods including hashing or block chain. By identifying the version that was signed and sealed, the responsible design professional can clearly identify any subsequent changes to the file that were not part of the signed and sealed version. Any engineering modifications after the signed and sealed version would not be considered official unless they are signed and sealed by a licensed professional engineer. Further, if an unlicensed person made modifications and tried to reissue the file, it would be identifiable, and the Board could investigate the matter for the potential unlicensed practice of engineering. Lastly, a copy of the signed and sealed version should be maintained by the responsible party to address any complaints or compliance questions.

Responsible Parties

If multiple design professionals work on a project that is transmitted as an electronic file, the identity of the design professional and which part of the design he or she responsible for should be indicated and embedded in the file. Similar to the seal and signature, if the software does not allow this information to be directly embedded in the electronic file, it can be captured on a transmittal memo until such time the software allows for the embedding of this information.

Modification Tracking

The electronic file and software should be capable of tracking modifications or indicating that changes have been made to the original work product. If a change has been made, subsequent design professionals would need to either sign and seal the modifications, or if the revisions necessitated changes outside of his or her area of expertise, to notify the original design professional to review the changes. An example of this circumstance is an electrical engineer needing to make a tweak to his or her design that would necessitate a structural design of the building to accommodate the design. If the electrical engineer does not have the expertise to evaluate the structural change, the structural engineer who originally signed and sealed the design would need to review the change.

Summary

The Board recognizes that technology evolves quickly and as a result, the method of transmitting engineering designs is also evolving. This Policy Advisory is intended to provide guidance to professional engineers that wish to transmit their work through electronic files. The Board will continue to monitor technological advances and will update this guidance as needed.