

DRAFT NOTES New Mexico

Request for NCEES Agenda Item

The case for removing or modifying “Engineering Surveys” from the current Model Law language

The National Council of Examiners for Engineering and Surveying (NCEES) is comprised of engineering and surveying licensing boards from all the states and U.S. Territories. As such, the admonition to safeguard life, health, and property and to promote the public welfare found in state statutory law creating these state regulatory boards manifests itself in the actions and policies of NCEES.

The mission of NCEES is to ensure public protection through the licensing process. Licensure is import because it demonstrates a standard of competency that the public can rely upon when procuring the professional services of engineers and surveyors.

This competency is acquired by the three main tenets of professionalism: education, experience, and examination. It is only through the rigorous application of all of these factors that one can be considered proficient enough to provide service to the public in their area of expertise.

The NCEES Model Law, as stated in its introduction, is a guide designed to “provide greater uniformity of qualifications for licensure, to raise these qualifications to a higher level of accomplishment, and to simplify the interstate licensure of engineers and surveyors or land surveyors.”

In doing so, a common set of standards is provided to NCEES Member Boards that represent “optimum, realistic levels of qualifications for initial and subsequent licensure to ensure protection of the public’s interest.” Yet the Model Law, as currently written, fails in this duty in one very important aspect, specifically, by inclusion of the term “engineering surveys” in the definition of the practice of engineering. In doing so, the Model Law provides for unlicensed practice of surveying by engineers thereby placing the very public which the NCEES and its member boards are charged to protect, at risk.

The Model Law defines engineering surveys to include “all survey activities required to support the sound conception, planning, design, construction, maintenance, and operation of engineered projects but exclude the surveying of

real property for the establishment of land boundaries, rights-of-way, easements, and the dependent or independent surveys or resurveys of the public land survey system.” This is nothing more than an acknowledgement that the unlicensed practice of surveying by engineers is acceptable to the NCEES.

Increasingly, it is recognized that surveying is a separate and distinct profession from engineering. Surveying is evolving into an increasingly complex body of knowledge the application of which requires ever increasing levels of education and experience. Surveying curriculums at many, if not most educational institutions offering associate, bachelors, and advanced degrees are designed to address this increasing complexity not only in boundary considerations, but also in “non-boundary” definitions of surveying, including geodetic and plane surveying, topographic map preparation, project control and other components for survey construction staking.

Most of these courses are mandatory for surveying students. This curriculum is a recognition that it is necessary to rigorously prepare the surveying student for the demands that they will encounter in their professional life.

Conversely, many, if not most engineering curriculums, no longer require their students to immerse themselves in surveying subject matter, as was once the case. Yet, most civil engineers feel fully qualified to engage in surveying activities even though the components of experience, education, and examination are missing from their background. Courses that are mandatory for surveying majors are electives for engineering majors who often decline to avail themselves of the opportunity.

One only need look at some of the aspects of the American Society of Civil Engineers’ (ASCE) definition of engineering surveys to note how encompassing the subject activities are:

- *The preparation of survey and related mapping specifications;*
- *Execution of photogrammetric and field surveys for the collection of required data, including topographic and hydrographic data;*
- *Calculation, reduction and plotting of survey data for use in engineering design;*
- *Design and provision of horizontal and vertical control survey networks;*
- *Provision of line and grade and other layout work for construction and mining activities;*
- *Execution and certification of quality control spatial measurements during construction;*

- *Monitoring of ground and structural stability, including alignment observations, settlement levels, and related reports and certifications;*
- *Measurement of material and other quantities for inventory, economic assessment and cost accounting purposes;*
- *Execution of as-built surveys and preparation of related maps and plans and profiles upon completion of construction; and*

Analysis of errors and tolerances associated with the measurement, field layout and mapping or other plots of survey measurement required in support of engineering projects.

While some parts relate specifically to civil engineering, the majority of the above activities are surveying functions found in traditional definitions of surveying in many states. In reality, when an engineer performs any of the above activities they are engaged in the unlicensed practice of surveying.

It is widely acknowledged that engineering disciplines continue to splinter with at least 16 sub disciplines. Specialization within each sub-discipline requires specific education and experience. Why then should all aspects of surveying with the exception of boundary, be considered as part of the purview of engineering including civil engineering?

This issue is articulated in an ACSE policy statement number 333 that states in part:

A number of recent developments have created some confusion with respect to the role of civil engineers in the practice of surveying. These developments have included:

- *The development of land surveying as a profession separate and distinct from civil engineering;*
- *The development of separate curricula and degrees at certain universities in support of land surveying as a separate profession;*
- *The reduced number of courses in surveying within civil engineering curricula; and,*
- *The development of disputes before state registration boards concerning the right of civil engineers to practice surveying, given separate registration for the practice of land surveying.*

Engineering surveying may be regarded as a specialty within the broader professional practice of engineering and, with the exception of boundary, right of way, or other cadastral surveying, includes all surveying and mapping activities

required to support the sound conception, planning, design, construction, maintenance and operation of engineered projects. Engineering surveying does not include surveys for the retracement of existing land ownership boundaries or the creation of new boundaries.

Engineering surveying or the engineering surveyor needs to be recognized as a specialty requiring specific education, experience, and examination. Simply claiming to be able to perform such activities by virtue of being a civil engineer does not recognize the reality of the situation. The model law makes no provision for this distinction.

At a minimum, there should be a formal creation of engineering surveyor as a specialty within civil engineering. Certification within the specialty is achieved through a combination of education, experience, and examination.

Civil engineering curriculums should acknowledge this specialty and engineering students desiring to practice within this area should avail themselves of either existing course offerings within surveying programs or specialized courses within engineering programs. ABET criteria for engineering and surveying programs should reflect this specialized area within the surveying profession. Minimum experience and formal examination would complete the necessary requirements of engineering surveyor.

Until such time that this becomes a reality, the Model Law should remove any reference to “engineering surveys”.