Structural Engineering Licensure in the United States

By Jon A. Schmidt, P.E.

Professional engineering (P.E.) licensure laws exist in all fifty states for the purpose of protecting the safety, health, and welfare of the public. The practice of structural engineering has a uniquely significant role relative to other design disciplines. Architectural, mechanical, and electrical system failures usually result in unattractiveness, poor functionality, discomfort, and/or inconvenience. A structural system failure almost always has more serious consequences; even in the best cases, there are often substantial costs associated with correcting what is or could become a life-threatening situation.

In addition, as stated in the joint CASE-NCSEA-SEI report on the National Summit on Separate Licensing of Structural Engineers that took place on November 3, 2000:

The field of structural engineering is changing rapidly. Buildings and other structures are becoming larger and more complex and are being constructed with new materials and methods. Along with these advances in the state-of-the-practice, owners and the public alike have increased expectations about performance. Some structures are now expected to remain serviceable even after experiencing a traumatic force such as a seismic tremor or winds. As a result, it is more important than ever for all engineers with responsibility for structural projects to have appropriate credentials, stay current in the field, and demonstrate sound judgment that comes only with experience.

Recognizing this, ten states currently have specific provisions in place that distinguish structural engineers from professional engineers in other disciplines: California, Hawaii, Idaho, Illinois, Nebraska, Nevada, New Mexico, Oregon, Utah, and Washington. However, there is considerable variation among these jurisdictions in the qualifications that are required for structural engineering (S.E.) licensure:

- Idaho, New Mexico, and Washington require at least two years of structural engineering experience for S.E. licensure, over and above the experience required for P.E. licensure. California requires three additional years.
- California, Oregon (beginning in October 2005), and Washington each require the National Council of Examiners in Engineering and Surveying (NCEES) Structural II examination and a state-specific Structural III examination for S.E. licensure, in addition to any examination passed for P.E. licensure.
- Idaho and Nevada require the NCEES Structural I and Structural II examinations for S.E. licensure, in addition to the NCEES Civil examination that is required for P.E. licensure.
- All others require only the NCEES Structural I and Structural II examinations for S.E. licensure, except that New Mexico does not require any examinations for those who have four years of structural engineering experience after P.E. licensure in that state.

There are also important differences in the significance of S.E. licensure within each jurisdiction. Typically they are described as "practice act" or "title act" states, but this terminology is often carelessly applied where S.E. licensure exists in the form of rules adopted by the licensing board, rather than statutes passed by the legislature. Additional confusion arises from the fact that California licenses civil, mechanical, and electrical engineers under a "practice act"; structural and geotechnical engineers under a "title authority"; and all other engineers under a "title act". A more accurate classification scheme refers to practice and title statutes and rules:

- Hawaii and Illinois have full practice statutes.
- California, Oregon, and Utah have partial practice statutes.
- Nevada has partial practice rules.
- Washington has a title statute.
- Idaho, Nebraska, and New Mexico have title rules.

The specific provisions in these states are as follows:

- Illinois and Utah statutes formally recognize structural engineers separately from professional engineers. Illinois even has a separate S.E. licensing board.
- Hawaii statutes require the seal of a licensed S.E. on construction documents in order to obtain a building permit.
- Illinois statutes require the S.E. license for anyone who practices structural engineering.
- California statutes require the S.E. license for schools and hospitals.
- Oregon statutes require the S.E. license for hazardous facilities, special occupancy structures, essential facilities over 4,000 square feet in ground area or 20 feet in height, structures with irregular features, and buildings over four stories or 45 feet in height, measured from the average ground level.
- Utah statutes require the S.E. license for complex structures.
- Nevada rules require the S.E. license for structures requiring special expertise, such as radio towers and signs over 100 feet, and buildings more than three stories or 45 feet in height, measured from the bottom of the lowest footing.

• Washington statutes and Idaho, Nebraska, and New Mexico rules provide special qualifications for the S.E. license, but do not explicitly require it for the practice of structural engineering.

This wide variety of S.E. licensing requirements across the country inhibits the mobility of those who already have the S.E. license in one state and seek to obtain it in another. Recognizing this, NCEES added the following definition to its Model Law in 2003:

The term "Model Law Engineer–Structural Engineering" refers to a licensed engineer who:

a. Is a graduate of an engineering program accredited by the Engineering Accreditation Commission of ABET, Inc. (EAC/ABET)

b. Has passed a minimum of 18 semester (27 quarter) hours of structural analysis and design courses. At least 9 of the semester (14 quarter) hours must be structural design courses.

c. Passes the 8-hour NCEES Fundamentals of Engineering (FE) exam.

d. Passes 16 hours of structural examinations consisting of one of the following:

(1) NCEES structural examinations, 8 hours of which are SE II

(2) 16-hour state-written structural examinations taken prior to 2004

(3) NCEES SE II plus 8-hour state-written examinations

e. Completes four years of acceptable structural engineering experience after confirmation of a bachelor's degree. A maximum of one year of credit may be given for graduate engineering degrees that include at least 6 semester (9 quarter) hours of structural engineering (in addition to the 18 hours noted above).

f. Has a record clear of disciplinary action.

In 2004, NCEES relocated this definition to its Model Rules and added the corresponding designation, Model Law Structural Engineer (MLSE), to its Council Records Program.

Separately, NCSEA's Member Organizations voted in 2003 to establish an independent body, the Structural Engineering Certification Board (SECB), to administer a national board certification program for structural engineers. Initially, it is possible to qualify for certification by virtue of holding, as of June 19, 2005, a valid license to practice structural engineering in any United States jurisdiction--which is simply the P.E. license in states where there is no S.E. license--and having been actively engaged in such practice for at least three years prior to the date of application. Future applicants will have to meet more specific education, experience, and examination requirements.

The MLSE and SECB criteria are intended eventually to serve as the basis for national uniformity in the qualifications required for S.E. licensure. Structural engineers who wish to lobby for it in states that do not yet have it must first address several key questions:

• Legislative statutes or board rules?
• Practice restrictions or only title recognition?
• Additional education requirements?
• Additional experience requirements?
• Additional examination requirements?

State boards generally establish by rule the specific education, experience, and examination requirements for licensure within general parameters that are set forth in the statutes. State boards also typically have the statutory authority to adopt rules of professional conduct that apply to all licensees, which could serve as the justification for restricting practice. Even so, some state boards may be reluctant to pass new S.E. practice or title rules without explicit legislative warrant, especially if resistance is encountered from organizations such as the National Society of Professional Engineers (NSPE), which has an official policy of opposing any form of discipline-specific licensure.

Seeking uniform separate S.E. licensure nationwide is a daunting task, but one that is worth pursuing--one state at a time. NCSEA plans to invest its resources in at least one or two such efforts in the near future. Structural engineers who believe that their states are ripe for action should contact the author or Larry Meyers, S.E., the current chairman of the NCSEA Licensing Committee, at **LMeyers@wje.com**.▪

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