Professionalism and Structural Licensing

Barry Arnold's presentation at the Ohio SEA (SEAoO) Annual Conference, Ethics: A Practical Guide for the Practicing Engineer, reminded us that a profession carries several distinguishing characteristics and it is more than an occupation. Although there is some variation in the exact definitions, most generally agree a profession's characteristics include the following:

- A core body of knowledge;
- Academic programs which teach the body of knowledge;
- Practitioners with autonomy in the application of the body of knowledge;
- Ethical rules of conduct that constrain practitioners; and
- Licensing laws or rules limiting who may practice.

Structural engineering meets the first four of these criteria and, with licensing of engineers, it partially meets the last.

Divinity, law and medicine represent the earliest professions. Pharmacy, accounting, teaching, engineering and others entered the professional ranks over time. Establishment of structural licensure in all jurisdictions would provide structural engineering with official stature due to both the public and its practitioners.

A typical structural engineer invests many years in training and education. Frequently, this starts before college with advanced high school classes as preparation for the rigors of university. Exams are commonly used to establish whether a student meets the necessary standards to begin college. The rigors of college entrance are evidence of the body of knowledge.

The study of engineering at the college level presents prospective engineers with a challenging curriculum. It includes the core arts, as well as history and communication courses which all students tackle, and adds intensive mathematics and science courses. College's structured environment provides the framework to teach how basic problems are solved with the application of scientific principles. All of a student's earlier coursework culminates in the last academic semesters, which focus efforts into a specialized field of engineering. These focused courses are where structural engineers learn the principles of analysis, building materials and building systems from the building blocks of earlier work.

University engineering programs convey the profession's core body of knowledge. Several engineering societies recognized the significance of the college curriculum and founded what is now the Accreditation Board for Engineering and Technology (ABET) to help ensure the quality of the programs. This body accredits college engineering programs. ABET accreditation is widely recognized as the standard necessary to establish an academic program's qualification and provides verification of the institution's qualification to convey the material.

The wide array of problems faced by structural engineers makes predefined solutions impractical, and it fosters the growth of new technologies and innovations of existing methods. A direct result of the wide array of possible solutions is that a large degree of autonomy is necessary to serve our clients. Upon entering the workforce, engineers learn various methods of applying the core body of knowledge under the guidance of more seasoned professionals. This guidance provides training in the application of knowledge and develops the independent thought process crucial to successfully using the autonomy available to engineers.

Structural engineers use this autonomy regularly. An engineer might decide whether a building should be built from concrete masonry block or framed by cold formed steel, whether a concrete frame or structural steel frame is more economical or, on a smaller scale, whether to use 10 penny or 8 penny nails in a joint. Independence in the application of engineering principles is evident in daily activities and necessary to effectively address the various factors influencing design. Our codes and standards are rarely so prescriptive that the engineer has no options.

It is clear that engineering meets the criteria of a profession. Establishment of structural licensure would provide the last step for structural engineering to take its place among the great professions of our society.

Engineering autonomy is balanced by ethical obligations. The special knowledge held by engineers, combined with a wide degree of freedom in how it is applied, give structural engineers a great responsibility. In Ohio, and most jurisdictions, engineers are bound by the state's rules of ethical conduct. Further, members of societies such as ASCE or NSPE have ethical codes of conduct. These ethical frameworks have common features: to consider public safety as the highest priority, to be truthful, to perform only in areas of expertise, to be faithful agents for clients and to continue development throughout our career.

Structural engineers face these ethical obligations daily. Without a second thought, thousands of people regularly depend on the fact that a structural engineer's work will perform, that the bridge will carry them home to their family, that their office will be there to host a critical sales meeting, that the high school stadium bleachers will let them cheer on their children, and much more. Structural engineers truly have to have high ethical standards.

Each jurisdiction's regulatory body limits who may practice engineering through a rigorous licensing process. The process includes consideration of education, training, experience, referrals and no less than two examinations. Ohio, like many other jurisdictions, offers examinations in 24 disciplines or variations of engineering discipline. Structural disciplines are considered in two distinct exams: the single day CivilStructural exam and the 16 hour Structural exam.

SEAoO joins ASCE-SEI, NCSEA, SECB and CASE in advocating the establishment of structural licensure.

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In Memoriam: Sue Frey

NCSEA mourns the passing of Sue Frey, P.E., S.E., principal structural engineer, CH2M HILL, and adjunct professor/instructor at Oregon State University. Sue was an active member of NCSEA and SEAO, and served on NCSEA's Licensing and Continuing Education Committees. She was also an instructor for the SE Review Course, and a past presenter of NCSEA webinars and NCSEA Annual Conferences. She will be sorely missed.

Technical and management sessions on structural engineering:

- ***Keynote:* The Philosophy of Design: The Structural Engineer's Role in Creating New Architecture** by Bill Baker, P.E., SECB, F.ASCE, FIStructE, Structural & Civil Engineering Partner, Skidmore, Owings & Merrill
- **Serviceability** presentation based on NCSEA publication Guide to the Design for Serviceability: In Accordance with IBC 2012 and ASCE/SEI 7-10 by author Kurt Swensson, Ph.D., P.E., LEED®AP, Principal, KSI Engineers
- **ACI 550** session by Harry Gleisch, Vice President of Engineering, Metromont Corporation, and Chairman of Joint ACI-ASCE 550, Precast Concrete Structures
- **Connections: The Last Bastion of Rational Design** by Bill Thornton, Corporate Consultant, Cives Corporation
- **ASCE 41 session**
- **Practical Design of Complex Stability Bracing Configurations** by Donald White, Ph.D., School of Civil and Environmental Engineering, Georgia Tech
- **DoD Minimum Antiterrorism Standards for Buildings** by Jon Schmidt, P.E., SECB, M.ASCE, Associate Structural Engineer, Burns & McDonnell
- **The Analysis of Offset Diaphragms and Shear Walls** by R. Terry Malone, P.E., S.E., Senior Technical Director, WoodWorks–Architectural & Engineering solutions
- **Load Generators: What Exactly is My Software Doing** by Kim Olson, FORSE Consulting
- **University of Minnesota Northrop Auditorium Renovation: Underpinning & Micropile Foundation Case Study** by Greg Greenlee, Principal, Engineering Partners International
- **The Structural Curtainwall** by John Tawresey, S.E., KPFF Consulting Engineers

The Annual Conference will also include:

- Social events that facilitate networking with fellow structural engineers;
- [New] reception for Young Member attendees;
- SECB reception and information on changes to application requirements;
- A trade show featuring the best in structural engineering products and services.

Check **www.ncsea.com** for continually updated information on Annual Conference educational sessions, events, and registration information.

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June NCSEA Webinars

Register at www.ncsea.com

June 11, 2013

Lessons Learned: Rebuilding the World Trade Center with High-Strength Concrete up to 14,000 psi

Casimir Bognacki, P.E., FACI

Rebuilding the World Trade Center required the use of several hundred thousand yards of concrete. This course will explain what field tests should be performed on delivered concrete to have some assurance that the high-strength will be achieved.

June 27, 2013

Building Design for Tornadoes

Bill Coulbourne, P.E.

This webinar provides information gathered in investigations into the Tuscaloosa, AL and Joplin, MO 2011 tornadoes, which are leading the ASCE 7 Wind Load Task Committee to include new commentary in ASCE on designing buildings to resist the effects of tornado winds.

June 14, 2013

Training for Post-Disaster Assessment

Jim Barnes

This California Emergency Management Agency (CalEMA) Safety Assessment Program (SAP) is one of only two post-disaster assessment programs that will be compliant with the requirements of the forthcoming Federal Resource Typing Standards for engineer emergency responders.

The program consists of three webinar segments available over one day's time. Cost: $500 – Per Connection. *Several people may attend for one connection fee.*

These courses will award 1.5 hours of continuing education. Approved for CE credit in all 50 States through the NCSEA Diamond Review Program. **Time:** 10:00 AM Pacific, 11:00 AM Mountain, 12:00 PM Central, 1:00 PM Eastern.