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**Testimony of Roy Merritt, Jr., P.E.
On behalf of the
The Connecticut Society of Civil Engineers (CSCE) Section of the American
Society of Civil Engineers (ASCE)**

**Before the
Joint Committee on General Law Regarding**

**SB No. 269 – AN ACT CONCERNING STRUCTURAL ENGINEERS AND
REQUIRING CONTINUING PROFESSIONAL EDUCATION FOR PROFESSIONAL
ENGINEERS AND LAND SURVEYORS**

March 6, 2012

Chairs Doyle and Taborsak and members of the Committee, my name is Roy Merritt, Jr., and I am a licensed Professional Engineer in the State of Connecticut. I am here today on behalf of the Connecticut Society of Civil Engineers Section of the American Society of Civil Engineers¹ (ASCE) to testify in support of SB 269 – AN ACT CONCERNING STRUCTURAL ENGINEERS AND REQUIRING CONTINUING EDUCATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS. As part of this legislation, CSCE strongly recommends that the Committee amend SB 269 to include language requiring that the education requirements to become a licensed professional engineer in the State of Connecticut be increased to follow the Model Law for licensure of engineers and surveyors developed by the National Council of Examiners for Engineering and Surveying (NCEES). The issue of academic and practice requirements for licensure is of great importance in order to safeguard the health, safety and welfare of the public.

I serve as the Chair of the Legislative Affairs Committee for the Connecticut Society of Civil Engineers Section of the American Society of Civil Engineers, a position I've held for the past five years. I am a lifetime resident of the State of Connecticut with 21 years of experience as a structural engineer, primarily in bridge design and have held a Professional Engineering license in the State of Connecticut since 1996. I am also a graduate of

¹ ASCE was founded in 1852 and is the oldest national civil engineering organization. It represents over 140,000 civil engineers in private practice, government, industry and academia who are dedicated to the advancement of the science and the profession of civil engineering. ASCE is a non-profit educational and professional society organized under Part 1.501(c)(3) of the Internal Revenue Code.

the University of Connecticut, having obtained both a B.S. and M.S. in Civil Engineering from the School of Engineering.

The legislation before the committee, SB 269, currently contains three major tenants; (1) to establish a structural engineering endorsement to the professional engineer license issued pursuant to Chapter 391 of the general statutes; (2) establish an application process for such license endorsement; and (3) require professional engineers and land surveyors licensed to complete not less than 15 hours per calendar year of continuing professional education. In addition to the above three tenants, CSCE strongly recommends that a **fourth key tenant be added to the Bill** that would increase the education requirements needed to be admitted to the examination to become a Professional Engineer. SB 269 should be amended to follow the Model Law for licensure of engineers and surveyors developed by the NCEES, which represents the state engineering licensing boards across the country. Specifically, CSCE recommends that the bill require that beginning in 2022, graduates of an accredited undergraduate engineering program will need an engineering master's degree or an equivalent 30 hours of graduate or upper level undergraduate courses before they can take the examination to become a licensed professional engineer (P.E.). This will be in addition to the three to four years of on-the-job experience that is currently required prior to taking the examination.

Tenant (1) – Establish a structural engineering endorsement to the professional engineer license, and Tenant (2) – Establish an application process for such license endorsement:

CSCE only supports establishing a structural engineering endorsement to licensure with respect to the design of buildings meeting the "Threshold Limit" as defined by Chapter 541, Section 29-276b of the Connecticut General Statutes and Connecticut Building Code Section 106.1.5. These buildings are larger, higher occupancy structures that generally have increased structural complexity and greater public safety concerns due to their level of occupancy, where a specific structural engineering endorsement to the professional engineering license is appropriate. We also feel that in the case of "Threshold Buildings", a structural engineering certification would serve as an additional measure of protection to the public, as many "Threshold Buildings" are privately developed and owned and don't have to follow quality-based selection processed for hiring of their design engineers, as public buildings procured through agencies have to follow.

CSCE emphasizes to the Committee that we **do not support** establishing a structural engineering endorsement to the professional engineering license for performing structural engineering and design of related to all other types of structures, including buildings not meeting "threshold limits", bridges, foundations, sign supports, catenary structures, temporary structures or shoring, and all other general structures. These general structures have always been designed by those licensed as a Professional Engineer, and CSCE is of the opinion that the expertise required for design of these structures does not warrant a specific structural engineering certification. In the case of transportation structures, such as bridges, the quality-based selection processes required by the Department of Transportation ensure that any specific technical expertise required of the engineers designing these structures, such as bridges, are met during the design procurement process.

Tenant (3) - Require professional engineers and land surveyors licensed to complete not less than 15 hours per calendar year of continuing professional education:

CSCE strongly supports documented continuing professional development, including ethics training, as a condition for maintaining status as a licensed Professional Engineer. ASCE established this policy in ASCE Policy Statement 425 - Continuing Professional Development for Licensure. Currently, Connecticut is one of only ten states in the Country that does not require any form of continuing education for maintaining a license as a Professional Engineer. We believe it is long overdue that Connecticut lifts its licensing standards to the level of the vast majority of states.

It is essential that practicing civil engineers remain current with issues and advancements in technology. In recent years, other state's boards and state legislatures have placed an increasing importance on continuing professional development to assist practicing professional maintaining and enhancing their competence.

In addition, ASCE has a Fundamental Canon in its Code of Ethics that states engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision. The NCEES has also developed Model Rules that endorse continuing professional competency requirements as a condition for licensure. The 15 hours of continuing professional education per calendar year proposed in SB 269 is consistent with the NCEES Model Rules, Section 240.30.

Recommended Fourth Tenant - increase the education requirements needed to be admitted to the examination to become a professional engineer:

CSCE's parent organization, ASCE, has been studying the concept of increasing the education requirements for licensure as a professional engineer for more than 13 years, and strongly recommends that SB 269 be amended to include the licensure requirements laid out in the NCEES Model Law. We believe that requiring education beyond the baccalaureate degree for admission to the examination to be a professional engineer is essential for a future that will rapidly become more and more complex. As noted in a report of the National Academy of Engineering in 2005, "It is evident that the exploding body of science and engineering knowledge cannot be accommodated within the context of the traditional four-year baccalaureate degree." The minimum education and experience requirements for licensure as a professional engineer must be raised.

The attainment of the P.E. license grants an individual a great deal of responsibility, as the individual has the authority to work on projects that affect the public's health, safety and welfare. Licensure requirements for engineers must be enhanced in preparation for entry into tomorrow's practice of engineering. This concept is a legacy for future generations of engineers.

Changes in the Engineering Profession

The engineering profession is undergoing significant, rapid, and revolutionary changes that have increased the knowledge required of the profession. These changes include the following:

- Information technology continues to make more information available; however, the synthesis and application of this information is becoming more challenging.
- Complex systems are requiring integration of our knowledge and skills outside of the traditional sub-discipline focus.
- The diversity of society is challenging our traditional views and increasing our need for improved interpersonal and communications skills.
- Many clients are searching for leadership in project management approaches that manage risk as well as improve cost, quality and safety performance.
- New technologies in engineering and construction are emerging at an accelerating rate.
- In the civil engineering realm, infrastructure within the United States is rapidly changing from a focus on development and operation, to the innovative renewal, maintenance, and improvement of existing systems, and the visionary development of new systems.

These changes have created the need for future professional engineers to have a greater breadth of capability and specialized technical competence than that required of previous generations. For example, many engineers must increasingly assume a different primary role from that of designer to that of program, project or team leader. With engineers assuming these increased roles there is a need for increased education to safeguard the public health, safety and welfare.

As another National Academy of Engineering report notes: "We must ask if it serves the nation well to permit the engineering profession and engineering education to lag technology and society, especially as

technological change occurs at a faster and faster pace.” Admission to the professional practice of engineering requires formal education beyond the baccalaureate degree.

Engineering versus Other Learned Professions

Requiring education beyond the traditional baccalaureate degree for the practice of engineering at a professional level is consistent with other learned professions.

One hundred years ago, four (4) years of formal schooling were considered the standard for medical, law and engineering professionals. While the education requirements for physicians and attorneys have been increased with the growing demands of their respective professions, the requirements for the practice of engineering have remained virtually unchanged (*see graph below*).

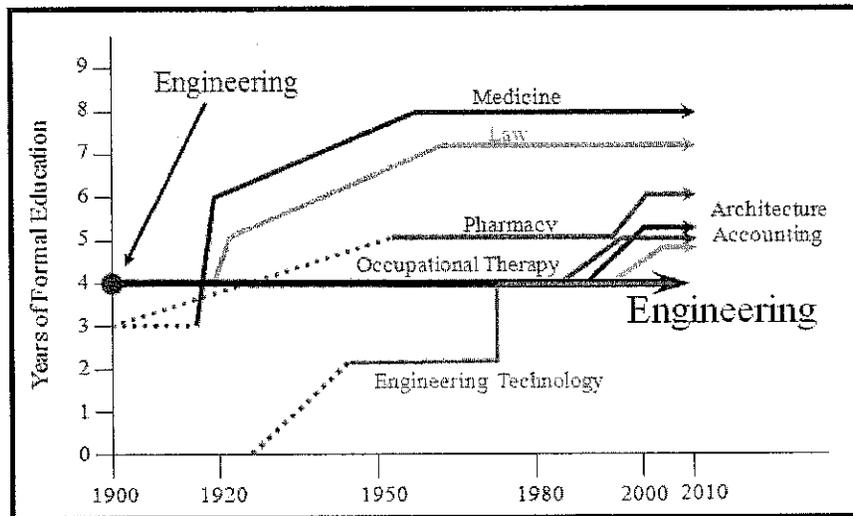


Figure 1. Years of formal education required to enter a profession

Today, many other professions beyond medicine and law require education beyond the baccalaureate degree including pharmacy, architecture, occupational therapy and accounting.

Engineering Education Today

It is not just a question of engineering education requirements remaining stagnant. The credits required to earn the traditional four-year undergraduate engineering degree have decreased significantly over the past decades (*see graph below*). This reduction in credit hours in all engineering disciplines is increasingly the result of state mandates that all undergraduate programs be funded only to a certain maximum number of credit hours—often 120-128—whether the programs be in English literature, engineering, or sociology.

University engineering programs are not in a position to reverse this trend. Add to that the increasing general education requirements that put pressure on the technical, profession-specific aspects of the curriculum and the engineering profession is faced with the impossible challenge of fitting even more fundamental knowledge into a shorter curriculum. This leads to a loss of depth of engineering in core subjects.

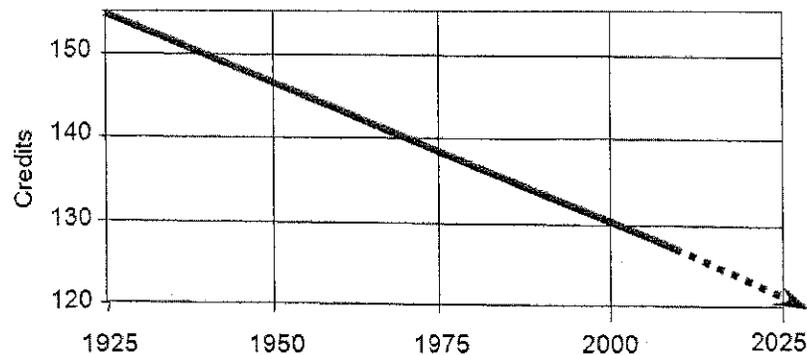


Figure 2. Credits required to earn the traditional four-year undergraduate engineering degree have decreased significantly.

The result is that in the future a baccalaureate engineering degree will be satisfactory for an entry-level position and for a significant career in support of the engineering team, but inadequate for the professional practice of engineering. The multi-year internship period after receipt of the baccalaureate degree, while extremely important, cannot make up for the formal educational material—i.e., the expanded knowledge—that would be gained from additional course work.

Conclusion

In closing, between the changes that have taken place in the engineering profession and the different and varied demands on the baccalaureate degree itself, it is evident that education requirements for licensure as an engineer must be increased.

CSCE believes that requiring education beyond the baccalaureate degree for admission to the examination to be a professional engineer is essential to protect the public health, safety, and welfare in tomorrow's complex world. ASCE supports the implementation of the requirements in the NCEES Model Law for Licensure as it will prepare for the entry into tomorrow's practice of engineering while respecting the qualifications of those already practicing as professional engineers when this new law would take effect in 2022.

By passing this legislation with our recommended amendment, Connecticut will be adopting the NCEES-recommended standard of licensure requirements, which will also ensure that its engineers are in the best position for licensure mobility among other jurisdictions. Connecticut will be a leader and will put the future stamp of excellence on its professional engineers.

The Connecticut Society of Civil Engineers looks forward to working with the Connecticut Legislature on this most important issue.

Thank you, that concludes my testimony. I would be pleased to respond to any questions you may have.

