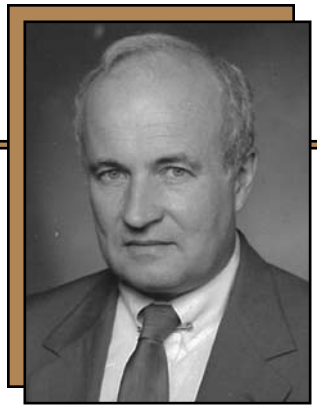

InFocus

Basic Education for Structural Engineers

By Craig E. Barnes, P.E., SECB

Ever since the establishment of the Basic Education Curriculum in 2002, the National Council of Structural Engineers Associations has been working on the various program facets that will be necessary for the full implementation of the curriculum, training, and testing components necessary to provide for the technically proficient structural engineer; one who is qualified by the Structural Engineering Certification Board (SECB). The outreach to schools and universities to track the curriculum offered by these institutions continues with the second national survey now underway. The results of this survey will be published in STRUCTURE, with recognition given to responding schools.

Alumni of schools and universities are being approached in order to establish a mentor contact that will provide schools with an important resource for education updates and program implementation. Dick Lowndes of the SECB Education Committee is heading up this effort. The initiation of SECB certification started a calendar of events that is targeting 2010 as the year students will have been able to complete the entire education program consisting of the nine-subject core curriculum. For practical reasons, the current certification program allows for a seven-subject core curriculum transitioning to the nine-subject core program in 2010. The two courses considered least critical are being discussed by SECB.

In 2010, the program will not only define curriculum, but also course content and outcome objectives desired. As the implementation of the full program is a comprehensive undertaking, interim steps for the education program, called the resolution of deficiencies, are proposed. *Figure 1 (see next page)* is a road map of the intended process between 2004 and 2010. During the transition period, our primary interest is to ensure that the nine-subject core curriculum is met at least in name. It will be a much longer process before there is true consistency in course content and contact hours.

The results of the first university and school survey suggested the greatest number of deficiencies lay in technical writing, timber, and masonry. To illustrate the philosophy of the transition program, comparison of steel and wood design is used herein as an example. Achieving competency in structural steel design requires a more rigorous educational program than wood design. Two semesters in steel design are necessary before an entry-level engineer can be reasonably efficient in transitioning from school to the office environment. However, the practitioner does not see as necessary the same contact level for education in wood design. In order to be an effective employee during the transition period, is it possible for a student to develop a working knowledge of wood without presence in a classroom environment? How best to direct that student seeking certification during the transition period is a challenge we are now facing.

A close match to the formal education process is available from Norwich University in Vermont. Norwich offers a comprehensive online program, with very limited residency, leading to a full Master's degree that includes steel, concrete, timber, masonry, and technical writing. Are there other alternatives for the engineer unable to participate in a full degree program?

You may recall the first NCSEA Winter Institute, held in Miami in 2001. The program offered some excellent engineering refreshers, as well as some fine introductory sessions that were a benefit to engineers and students seeking an introductory exposure to selected structural engineering topics. The LRFD timber design session was one of the presentations. While that particular presentation was not set up specifically to provide credit hours of Basic Education, it served well to expose individuals who might not have had formal timber design to the engineering principles of the *National Design Specification*® (NDS®) for wood construction. One of the issues the Education Committee is addressing is whether or not that type of contact, in a semi-formal education setting, is sufficient for transitioning to the office environment, where the practitioner will then be able to take over the training of the student.

Another approach on a temporary basis, at least during the transition period, may be to combine the resolution of deficiencies with NCSEA's Diamond Review Program for continuing education. The formal education would not be as rigorous as that provided in the university setting, but it would be a substantial crutch to the tradesman process of learning solely in the office environment.

Are these alternatives a better approach than expecting (hoping) the employer will find a way to train the engineer to reach a level expected for SECB Certification? Your comments are welcome.▪

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Figure 1

Grandfather	***Phase I***	***Phase II***	***Phase III***	***Phase IV***	***Phase V***	***Basic Certification***
	Graduation Yr: '01, '02, '03, '04	*Graduation Yr:* '05, '06	*Graduation Yr:* '07	*Graduation Yr:* '08	*Graduation Yr:* '09	*Graduation Yr:* '10+
BSCE + PE	*Education:* ABET, BSCE	*Education:* † BSCE, ABET+ Resolution of Deficiencies	*Education:* † ABET + Resolution of Deficiencies + MSCE	*Education:* † ABET + Resolution of Deficiencies & MSCE + BOK*	*Education:* † BSCE + Full Program +BOK*	*Education:* †† BSCE + Full Program +BOK*
	Experience: As Required for State Exam	*Experience:* As Required for State Exam	*Experience:* As Required for State Exam + SECB Work Place Criteria**	*Experience:* As Required for State Exam + SECB Work Place Criteria**	*Experience:* As Required for State Exam + SECB Work Place Criteria**	*Experience:* As Required for State Exam + SECB Work Place Criteria**
	Testing: FE + State PE or Struct I	*Testing:* FE + State PE or Struct I + Struct II	*Testing:* FE + State PE or Struct I + Struct II	*Testing:* FE + State PE or Struct I + Struct II	*Testing:* FE + State PE or Struct I + Struct II	*Testing:* FE + State PE or Struct I + Struct II
	CEU's: Same as State Requirement	*CEU's:* Same as State Requirement + Reg of The Most Rigid State	*CEU's:* Tech ≤100%, Structural Process ≤25%, Code ≥ 25% ≤50%, Business ≤10%, Ethics, Teaching, Professional Assoc's, Loss Prevention	*CEU's:* Tech ≤100%, Structural Process ≤25%, Code ≥ 25% ≤50%, Business ≤10%, Ethics, Teaching, Professional Assoc's, Loss Prevention, Acceptable Content ***	*CEU's:* Tech ≤100%, Structural Process ≤25%, Code ≥ 25% ≤50%, Business ≤10%, Ethics, Teaching, Professional Assoc's, Loss Prevention, Acceptable Content*** Individual Proficiency Review**	*CEU's:* Tech ≤100%, Structural Process ≤25%, Code ≥ 25% ≤50%, Business ≤10%, Ethics, Teaching, Professional Assoc's, Loss Prevention, Acceptable Content*** Biannual Proficiency Review**

* ASCE Body of Knowledge
** To Be Developed
*** NCSEA's Diamond Review Program

† 7 Subject Core Program
†† 9 Subject Core Program