

## The SE Exam as a Learning Opportunity

By Barry Arnold, P.E., S.E., SECB

**A**fter the licensing law changed in Utah, I was among the first civil engineers that were required to take the NCEES 16-hour Structural Engineering (SE) exam in order to use the newly created title of Structural Engineer. I was not happy about that, because after having completed college and passing the FE and PE exams, I thought it a silly waste of time to sit for another exam to prove that I was indeed competent to perform the structural engineering work that I had already been performing for the previous eight years.

Regardless of my personal feelings, I believed that passing the SE exam was something that I ought to do and that in time, as more structural engineers passed it, it would ultimately improve the quality of design and increase the protection of the public. I readied myself by acquiring various study guides, dusting off my old textbooks, and purchasing the latest design guides. Six months before my exam date, I began to study diligently.

The possibility of failing the SE exam was a great concern, but in my personal discussions with engineers who have not passed it, they often noted that they had not taken their preparations seriously enough. They fell into the trap of thinking that for someone with experience, who has been doing structural design work in the past, the SE exam should be a cinch.

In the back of my mind rested the words of a favorite professor reminding me that an exam was not given so that I could expound on what I believed, but to give me a chance to show what I knew and how well I could think. I approached my preparations from the perspective of being a student – specifically, I was trying to learn and be educated. The experience was rewarding, because:

- I obtained a clearer understanding of the code. Reading how other engineers interpret and apply the code was insightful – so much so that the study material that I collected is still readily accessible, and I

frequently refer to it for guidance on today's design problems.

- I found that practice examinations with comprehensive solutions were of key importance. They forced me to think not just about how I would normally solve a particular problem, but also about alternative approaches. Understanding how other engineers tackle such challenges made me think longer and deeper about ideas that had become mundane and routine to me.
- The study guides proved to be invaluable aids and useful resources. They expanded my understanding of areas that I thought I already knew and understood, and generated new thoughts that I had not fully considered before.

During the course of my career, I have been taught by a handful of great structural engineers, both inside and outside my company. Being exposed to a variety of techniques and receiving a diverse education was, I believe, essential to my initial success. Preparing for the exam exposed me to others, outside of my usual peer group, from whom I gained additional insights and new ideas that could be readily applied during the exam and at the office. The added depth and breadth that this provided has greatly contributed to my continued success, and enhanced my ability to design and analyze structures in a manner that safeguards the health, safety, and welfare of the public.

In fact, preparing for the SE exam changed forever how I think, interpret the code, and practice structural engineering. During the exam, I had to perform calculations by hand that I have been relying for years on a computer program to do. As a result, I later found errors in programs that I had written, expanded the content of a number of in-house programs to include checks for items that I had not previously treated with enough attention, and discovered errors in canned

programs whose output I previously assumed to have been thoroughly verified.

Since preparing for and taking the SE exam, I have noticed big changes in how I think and feel about licensure. Because of how hard I had to work, I developed a deeper respect for what SE licensure means to me and the obligations associated with the title of structural engineer. I have also experienced feelings of satisfaction from setting a goal and achieving it, as well as accomplishment at having cleared a “higher bar” and being able to display SE behind my name, and benefits like being a part of making the structural engineering profession better.

Since I took the SE exam, there have been big changes in the available resources that can be used to prepare for it. When I studied, I did not have the benefit of webinars and resources were limited. NCSEA now has a great series of SE exam preparation material presented by practicing structural engineers that could prove useful for the exam and in the office.

For me, the real value of the SE exam was not in the passing of it, but in the preparation to take it. Passing was of lesser consequence compared to the significant growth that came from studying for it. I added extensively to my war chest of valuable tools, techniques, and useful insights to solve difficult and everyday structural design problems. I certainly did not become a perfect structural engineer, but I definitely became a better structural engineer for expending the effort to take the SE exam and being receptive and open to the educational opportunity that it presented. ■

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