



A Remarkable Profession!

By Stan R. Caldwell, P.E., SECB

Structural engineering has been around since the first cave shortage, yet there is a growing perception that this noble profession might now be dying. What fuels this troublesome notion? Perhaps it starts in high school, where many of the brightest students are discouraged from pursuing the long, hard path to engineering. Why labor over calculus and physics, when those hours could be more productively spent learning “high tech” skills like HTML5? Those who resist this logic are often advised to pursue fields of engineering such as electrical and chemical, which are perceived to offer high initial compensation and early exposure to emerging technology.

The perception does not improve in college. Students discover that entry into the profession usually requires a master’s degree, a 4-year internship, an 8-hour fundamentals exam, and a 16-hour professional practice exam with a low passing rate. In return, they are told to expect a modest but comfortable income. Structural engineering has the distinction of being perhaps the only recognized profession that is not supported by any dedicated departments or degree programs at major universities. The dean of engineering at one large institution believes that structural engineering is obsolete. He views structural engineers as little more than math technicians who meticulously follow precise recipes to produce adequate designs.

In the workplace, many structural engineers find themselves positioned pretty low on the project “food chain.” MEP engineers typically receive higher fees in return for somewhat less effort and far less liability. Architects and civil engineers are almost always the prime professionals on building and bridge projects, respectively. They frequently select structural engineers based exclusively on price, often neglect to include them in the critical conceptual phases of their projects, and pass along as much of the liability as possible. Only a handful of states offer any type of “S.E.” license; most simply lump structural engineering with all other disciplines under a generic “P.E.” license. Meanwhile, structural design codes and regulations have evolved into a self-perpetuating industry, with each revision becoming more prescriptive, thereby allowing less opportunity for structural engineers to exercise their professional judgment.

Finally, there is the general public; they really have no clue who we are or what we do. Based on media reports, it seems obvious that buildings are designed by architects and bridges are designed by state highway engineers. I can think of just one movie featuring a structural engineer, and he turned out to be a terrorist (Tim Robbins in *Arlington Road*). Likewise, the only television series featuring a structural engineer highlights a criminal (Wentworth Miller in *Prison Break*). Compare this with virtually any other profession. The problem is not that we suffer from a poor public image, but rather that we have no image whatsoever!

Enough! The reality is that structural engineering is a wonderful profession with a bright future. In his 1929 Inauguration Address, President Herbert Hoover stated:

“Ours is a great profession. There is a fascination of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal ... Then it elevates the standard of living ... That is the engineer’s high privilege.”

Tremendous satisfaction can be achieved by observing the successful completion of a significant building or bridge that you have nurtured from conception. There is also considerable satisfaction derived from the service that we render to society. Ron Hamburger once wrote: “Most structural engineers, over the course of their careers, are responsible for protecting more lives than most medical doctors.”

It is a myth that structural engineering is a lousy business and structural engineers are poorly paid. Structural engineers are not prohibited from acting as the prime professional on any project, and many are seizing that opportunity. While fee pressure will never be eliminated, it can be effectively remedied by emphasizing value and striving for better clients and projects. Structural engineers normally are compensated at least as well as architects and civil engineers with comparable experience, and some become wealthy.

We provide structural engineering services by exercising considerable professional judgment, even though we do not always recognize it as such. We are continually challenged with the ever-increasing size and complexity of our structures, as well as the advanced materials and techniques used in their construction. Computers have given us incredible power to test multiple options and visualize the results without the number-crunching drudgery of years past. In fact, it might even be argued that structural engineering is fun!

What about the future? Under sustained pressure from automation, globalization, and contractor-led procurement, the role of the structural engineer is certainly not guaranteed. Will we sit quietly on the sidelines and accept whatever role society crafts for us, including possible obsolescence, or will we actively work to steer the profession toward a thriving future? All structural engineers, and especially younger structural engineers, must step beyond the workplace. One good place to start would be active involvement in your SEI or SEA chapter or state organization. Another would be service on SEI, NCSEA, CASE, or SECB committees; there are more than 100 to choose from. As Richard Weingardt often says: “The world is run by those who show up.” The time has come for structural engineers to conquer their stereotypical inhibitions and show up. ■

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