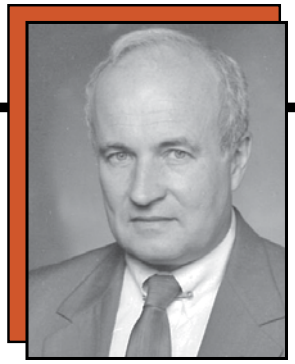

The Inevitability of Change

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

I am sure we have all heard, overheard, or at least read about Peter Finch, the actor in the movie Network who announced, "I am going to throw open my window and tell everyone I'm Mad As Hell and I Won't Take It Anymore." Do you feel like that character at times? To be candid, the target for this InFocus piece is established engineers [gray-haired] who are just trying to turn out a job and make a couple of bucks. For this group, structural engineering can be very frustrating. When we left school, our heads were filled with all sorts of good stuff. We understood the simple mysteries of the AISC and the ACI 318 code. We knew you could use three grades of steel efficiently to increase performance of your structure and satisfy the architect who was trying to make things really skinny. Through the magic of pre-stress and post-tensioning, we could make concrete thin, and with a little bit of luck and detailing, reduce cracking of concrete (as we learned and heard over and over again, cracks). We could use our laboratory experiences in metal, concrete, and soils to actually relate to what the textbooks said. As structural engineers, we could evaluate geotechnical reports and extend that knowledge to foundation designs. We understood engineering design and the solid principles behind it. We had one code on our desk, perhaps it was the National Building Code, or we followed what older members of the firm told us we should be doing. That is how we entered the professional world; that is how we began to practice. Life was good.

At that time, change in our engineering lives appeared to be gradual. Over a short period, we would stop writing our own software programs; the use of the keypunch became a thing of the past. Most older engineers can remember the office keypunch that connected to a mainframe in St. Louis. Before you knew it, the Trash 80 appeared on your desk, along with a whole host of exciting subroutines embedded in 5¼-inch floppies that began to make problem-solving really exciting. Then the growth in computer knowledge and electronic processing became explosive. Building and material codes appeared like a mold creeping across our shelves... Boca, UBC, Southern Building Code. We also had to have codes for the various promulgation dates adopted by jurisdictions. Of course, ACI and AISC were not to be outdone, as they introduced more and more changes. Oh, and did I forget to mention how the computer age was going to save the trees? That was a laugh and a half! In the past, we had to be efficient preparing specifications. Cut and paste was an efficient use of paper. Hand drafting meant you knew the job throughout and put as much thought into detailing as was done in the design. A drafter's time was valuable, and a good drafter could provide as much assistance in preparing a set of documents as the engineer. With the advent of electronic drafting, anyone that did well as a kid with their Etch-a-Sketch could be a drafter. Does the process today make you want to open the window and yell, "I'm Mad As Hell and I Won't Take It Anymore?"

Wait a minute, what am I saying? I remember as a young engineer just amazing my dad, who was a civil engineer, as I described A36, A242, and A440 steels. He was just as amazed to learn there was something other than what he used for his 1-2-3 concrete mix design, as I explained the use of concrete up to 6,000 psi. He couldn't imagine what one could do with post-tension concrete, although he did think it was a good idea. Do you suppose my dad was Mad as Hell? Let's roll the tape forward. My office is fortunate to work with young cooperative education students attending Northeastern University in Boston as they prepare for their professional careers. They are entering the arena with those frustrations I just described all around them. Just like our introduction to the profession, young engineers do not see these issues as frustrations and are not about to open the window and yell "We're Mad as Hell." Is this frustration just a matter of perspective? I think it is.

I believe our role as senior engineers is to manage the process. Codes will change. The process of applying engineering to the built product will change. What engineers need to learn in the classroom will change. New materials for construction will be introduced to the marketplace. These are things we do not want to stop, but we certainly can stay involved and manage the process. What do you think?▪

Your Turn

What key changes to the structural engineering profession have you noticed over the course of your career? Do you find them frustrating, encouraging, or a mixture of both? What key changes do you perceive to be in progress right now? Please submit your responses and see what others have had to say by clicking on the "Your Turn" button at **www.STRUCTUREmag.org**.

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