

Essay prompt 3: What is your opinion about the public's perception of structural engineers? Provide suggestions for how structural engineers might increase recognition and general public awareness of the profession.

“So, like an architect?”

Is a follow-up question you, I, and everyone else in structural engineering have received after describing our work to a well-meaning, curious friend, family member, or stranger. Far be it from me to disparage someone for misunderstanding our niche profession. Rather, their question is an opportunity to explain the distinction between an architect and structural engineer and go beyond to express the universal importance of our profession.

Sometimes it seems that architects have a monopoly on the cultural shorthand for “someone who designs buildings.” As humans who deal with infinitely complex systems every day, both in our professional work and society at-large, we need shortcuts to speedily navigate life without over-thinking every situation. For example when checking out at a store the cashier communicates with automatic shorthand such as “paper or plastic” and “cash or card.” Or, when designing a concrete beam I can start by setting the preliminary beam depth in inches equal to the beam span in feet ($d=L/12$). Experience with such shortcuts, developed consciously or subconsciously, is what makes seasoned engineers valuable as they can readily recognize important elements in the complex systems they are analyzing, ask pertinent follow-up questions, and provide preliminary conclusions with limited information (such conclusions to be quantitatively verified by lucky staff level engineers).

Concise definitions of professions increase their recognition in culture. We understand that architects design buildings, nuclear engineers design power plants and weapons, mechanical engineers design cars and planes, and software engineers design apps. These simple definitions certainly do not convey the full scope of these professions nor are these professionals the sole persons who work the listed topics. But they are useful definitions to understand the professions in a sentence.

How can structural engineers develop a similar shorthand for describing their own work without diminishing its variety and importance? It would be convenient to share with architects

the title of “people who design buildings,” but this inadequately describes the field’s scope and criticality (architects would undoubtedly feel similarly about the narrow scope of this definition). In reality structural engineers have contributed to the design of all the items listed for other professions above: buildings, power plants, weapons, cars, planes, and even computer applications. We could proudly express the wonderful variety of our profession by smugly stating that a structural engineer “designs structures” and our hypothetical conversation partner would roll their eyes at that redundant non-definition.

To increase the recognition of structural engineering towards the universal cultural understanding enjoyed by architects and doctors, two key ideas must be disseminated. First is to imprint in people visualizations of what constitutes a “structure” including buildings, bridges, other infrastructure, planes, vehicles, equipment bracing, offshore oil and wind farms, movie sets, rollercoasters to name a few. The word structure alone should conjure to mind a montage of physical steel, concrete, wood, or masonry skeletons of iconic examples of each of these: The Eiffel Tower, Golden Gate Bridge, Hoover Dam, Boeing 747, and Disneyland’s Space Mountain. This cascading series of mental images could even include colorful 3D analysis models like a sequence from *The Matrix* set in SAP 2000. This recognition can be accomplished by usage of the word structure accompanied with such images; then, the association with structural engineering will be generated naturally.

The second key is to espouse the importance of structural engineering to all of the built environment. Structural engineers ensure life safety for entire populations in all kinds of infrastructure. The failure of major structures under gravity demands, environmental loads, or natural disasters can cause a significant number of deaths. One unlikely figurehead for the magnitude of these risks is the actor Dwayne “The Rock” Johnson in disaster action movies such as *San Andreas* and *Skyscraper*. CGI’d Hollywood blockbusters are exaggerated examples, as the entirety of Los Angeles would not subside into the Pacific Ocean after a major earthquake, but there are real risks to life addressed by our work. Real life tragic examples around the world include earthquakes in Japan and Haiti and Hurricanes Katrina and Maria. Another pertinent example is the seemingly sudden collapse of the Surfside condo building in Miami, Florida. This recent disaster has gained so much public attention that people don’t ask of my work, “are you

like an architect?” they ask, “what do you think about the Florida collapse?” Due to powerful primary footage and investigative journalism, this unfortunate incident wrought the secondary benefit of educating the public about both the practice and importance of structural engineering.

While fatalities related to misapplication of our practice do happen, they are rare. It is not respectable PR to market an industry based on fearmongering alone, despite its success for the military-industrial complex and hair loss clinics. Additionally, we should not count on the notoriety of individual disasters to sell our importance for us, as they do reveal failures of our profession. We should also promote the successes of structural engineering: reduced building collapse over time, achievement of grand gathering spaces, increased longevity of structures, reduction of environmental impact, construction of iconic architecture, creation of equitable and enjoyable places to live, and connection of society through transit infrastructure. There are innumerable beautiful, successful, and iconic projects which would not have been possible without a structural engineer. We need to remind people of that for each of them.

In summary, structural engineers could use a concise, redundant title as “people who design structures” accompanied by an increased cultural understanding of what constitutes a structure, the consequences of their failure, and the benefits of their success.