

WHY I WANT TO BE A PROFESSIONAL ENGINEER.

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During the days of scribbling with crayons and reciting the alphabet, I used to picture a man in his 30s clad in overalls and lying on his back to fix the underside of a car, usually with a screwdriver or a wrench, whenever I was exposed to the word “engineers.” Overly exaggerated and comical media depictions of the “engineer” did not lead me to question my assumptions any further. Like a famous Chinese idiom, I was a frog at the bottom of a small well. Little did I know that engineers specialised in fields ranging from electronics to water treatment, and were realisers of such marvels as the trans-continental railway to the Saturn V rocket.

The engineer has been and is, a maker of history. Before I knew of the existence of a structural engineer I was fascinated by ancient global landmarks such as the Great Pyramid of Giza, Taj Mahal, Petra...etc, and despite my inability then to even define an engineer, I could name off the back of my head the 10 tallest structures in existence along with their heights and corresponding number of floors (which are now all overtaken in a period of 10 years). I even memorised the 7 wonders of the medieval and ancient worlds.

However I also knew that most of these beautifully envisioned and eye-catching icons such as the Lighthouse of Alexandria or Hanging gardens were reduced to a mound of rubble in a simple 5 minute earthquake, a monumental contrast to the decades spent in construction. Only last year did the devastating Si-chuan earthquake destroy countless acres of traditional buildings such as pagodas, all meticulously designed and culturally vibrant. Nevertheless certain modern buildings with inferior aesthetics survived, proving correct application of engineering determined the structures that overcame nature. That was when I decided to question what truly constitutes a “wonder of the world,” and whether it would be possible to fabricate a structure able to withstand any natural disaster to be appreciated or utilised by generations well into the future.

I now believe that a structure is truly spectacular if it can stand to be appreciated. Therefore when I encountered the term structural engineering while wandering through the various career seminars I developed an immediate interest. My priorities then were that the ideal profession will challenge me to think critically, enable me to apply my keen interests of science and mathematics into real life practical situations, and consistently present me with differing challenges so that it's never the same game which would demand functioning like a machine continuously jammed on one program.

Structural engineering satisfies all these aspects optimally. The structural engineer must consider all possible factors such as strength, stiffness, and stability when subjected to dynamic loads such as wind and seismic, static such as furniture and transitory such as impact to ensure a building is durable. They are responsible for cost, constructability, sustainability and contrary to popular belief; an engineer is also capable of employing creativity by designing the aesthetics and use the imagination to visualise solutions adapting to any requirement. This acted as a bonus and induced me into applying for the engineering intermediate year at the University of Canterbury. To prepare for this I have also been studying at scholarship level in physics, calculus and statistics, participating in prestigious science programs such as the Genesis Energy Realise the Dream event, and achieving NCEA levels 1 and 2 with excellence. My dedication has rewarded me as this year's dux of Bayfield High school and I hope that these privileges will become a prominent addition to the engineering industry of tomorrow.

It is said that scientists investigate that which already is while engineers create that which has never been. More efficient ways of utilising existing and newly synthetic

materials are constantly discovered and revolutionary concepts are ceaselessly brought forth by architects, though they will be no more than educated little children in the absence of a civil engineer to point a finger at the flaws and unfeasibility of their designs. Skyscrapers like the Burj Dubai and Taipei 101 would have been merely a far-fetched vision without the presence of engineers, the mile-high Illinois never left the drawing board due to a lack of today's engineering disciplines, and who knows, one day maybe even outrageous publicity stunts such as the X-Seed 4000 may be more than a fictional architectural marvel.

An ideal engineer is a composite fusing and utilising all the disciplines of technology, tools and resources in order solve problems, communicate effectively, make decisions, design solutions, and even save lives. They demand respect because they have the potential to aid society by protecting its members through a seismic proof foundation, provide basic necessities such as electricity to apartments, and revolutionise the way structures are regarded to allow new ways of thinking and experimentation. These skills, responsibilities and qualities have become my source of motivation to attain the status of a professional structural engineer, and I would be truly grateful for an IPENZ foundation scholarship to propel me one step closer to my ideal career. This would grant me an opportunity to be part of such exciting projects to realise structures that will withstand nature's forces while breaching the boundaries that limit the designs of today. The Sky tower is the tallest building in the southern hemisphere right here in New Zealand; I see this as being just the start of a conceptual future.

Tourists may not flock to transverse the Panama Canal or compose an oil painting on canvas of the channel tunnel as much as they would select the chateaux de la Loire for a love scene, but these structures are designed to test the forces of nature, and are physical realisations of the possibilities that mankind has opened up previously thought to exist only as visions. And for this reason engineers are the realisers of dreams. People still regard their work as unbelievable today, and that is why only their achievements are called the "Wonders of the World."

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