



## Construction Engineers Improving the Construction Industry

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If there is anything I learned working in the Construction Industry for 5 years is that you can't trust contractors and their employees. For example, I was filling in our property with back fill. The contractors siphoned off the loads of rock storing it onsite for later removal. We needed that rock to stabilize the backfill. Then there was the contractor who brought fill that was tailings from a landfill. Then another contractor spilled oil on the land. On and on it goes. We have probably over 50 contractors work on the site; not one of them did everything they said they would do. I call it the future promise.

When I was hired by an experienced civil engineer, graduate of Queen's University, he made promises in the job interview that he had no intention of keeping. He said they pay all expenses for engineers who have to travel to job sites. That was a lie. On day one, he told me that they don't pay for the gas to get back home on the weekends. There were many other lies he told. Even engineers couldn't be trusted.

The solution is that the industry has a lot of contracts and disputes. The General Contractor and subcontractors are in constant conflict and disputes. Also, with competitive bidding, the General Contractor is in an adverse position with the Employer / Owner. It all makes for an inefficient setup for the construction of a project.

I noticed that the solution may be in strictly hiring professional engineers for positions of oversight. The Project Manager represents the General and subcontractors and the Clerk of the Works represents the Owner. It's too bad that such oversight is required, but there is no such thing as an honest General Contractor.

I worked with several engineers. They seem to be the most honest, although not exclusively so. I had one engineer who had a master's degree from Waterloo who said on day one: The Rules are there are No Rules! So much of the engineering Ethics test. Then another boss who was a Queen's Engineer who drove a hard bargain. He got wind that the owner was going to make a change to the contract in a certain area. So he advanced the work in that area as a money making opportunity. More demolition was required netting him a larger change order. So much for the environment.

Another fellow, Thane poured a slab as 4 inches thick whereas the plans called for a 6 inch slab. He said, every slab I ever poured was 4 inches. Why would this one be 6 inches. The slab was the foundation for a water treatment plant; not a house as he was used to. That fellow passed himself off as a Site Engineer even though he was a drop out of engineering school after one week. Contractors can't be trusted.

It is the nature of the people who are attracted to that industry. One solution may be to have professional engineers in positions of authority and oversight. It takes 4 years to fully train an engineer just out of university. That is the amount of time that is required to get an engineering licence. It's not perfect, but it should improve things. After all, the definition of engineering includes "the management of constructed works." Either the Engineering associations need to enforce this, or they need to drop it. Currently we have workers who are not engineers managing constructed works. This would also drive-up wages of engineers working in the construction industry.

Currently they are the lowest paid engineers of all the various aspects of engineering work. The senior engineers feed on the younger engineers because they have the opportunity. My salary after 4 years

with the same company was below the decile of recent graduates in the Engineering salaries table. In other words, my salary was so low that I didn't even register on the table. My coworker who was a licenced engineer was paid less than his mother who was a secretary. He graduated from the top engineering school in Canada.

When you don't have engineers at the helm as project managers, the quality of the work suffers. Also, money is at risk due to poor oversight. Engineering is supposed to be a brotherhood. That's what the Iron ring ceremony is about -the chain that binds us. Passing an ethics test will not ensure that you get ethical engineers. Contracts are necessary to help control the mandates of the work. Although many trades' men do a good job, there are those who don't. There are good Engineers, and there are bad engineers. There are good subcontractors and there are bad contractors. There are good tradesmen and there is bad one.

If you are a whistle blower as an engineer, you'll find yourself out of a job quickly. Your boss will cover his own ass even when he's the supervisor of an Engineer in training, no matter how low your salary is.

A lot of site staff including the site supervisor hates engineers. My father was one of them. It evokes feeling that they somehow failed. Cocky engineers make things worse.

Employers lie to future employees. They rely on the future promise. Of course, in a bad economy, engineers have no leverage. That is why I instigated the union for professional engineers in Ontario.

So the Project Manager and the Clerk of the Works should be licenced engineers or at least engineers in training. Every building construction is unique and will have its own problems. It's the nature of the business and the workers the industry attracts. If you don't fair well in a high conflict environment, choose design or another profession. But things do get built. The quality of the works is not bad but could be better. The way the industry is arranged is probably the best it can be under the circumstances. Keeping construction teams together is the best way to improve smooth progress. This leads itself to the design build contract set up with a construction manager at the helm representing the owner. Speed is a key factor since costs for a construction project are tied to financing. Time is money. Architects often work in this role as well as the design. I think having the architect is superior to having a Construction Manager (who should be an engineer not at risk other than professional liability). As for Architects being a construction manager, we know that the skills needed for design is not the same as being a good manager.

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Construction is a people business. Many engineers are not people persons. However, some are. The best boss I had in Construction was not an engineer. He was a military man. Nevertheless, putting engineering in the Project Manager role and the Clerk of the Works should improve the work in the construction business. On another note, job training is poor at universities. They need to improve at universities. I appreciate that university is not about job training, but rather about education. Fine if you can afford that. If the student is borrowing the tuition, it's a bad investment for Civil Engineers who work in the

construction industry. I regret taking Civil Engineer Construction Management. Engineers are not respected by nanoengineering bosses and site workers alike. Engineers should be supervised by engineers so that the code of ethics is respected. You'll find yourself out of a job if you adhere to the ethics when your boss doesn't.

Lots of room for improvement. It's up to the Employers and the Engineering Associations to enact these recommendations.