
ORGANIZATION OF THE CONSTRUCTION INDUSTRY

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ABSTRACT

General Contractors and subcontractors are always becoming insolvent in their normal course of business. In this paper, we consider how the construction industry is organized. We consider making use of Professional Quantity Surveyors as an attempt to control costs in construction.

I worked in a variety of engineering positions including Municipal Design, Highway Construction, Works Operations, Heavy Industry, Building construction (Site Super, Estimator, Project Administrator, and Project Manager). My career ended after working for the 7th largest GC in the USA who bought more heavy equipment from Caterpillar than anyone else in the world excluding the US Army. I didn't get along with the women in the industry. Also, the managers were liars; they couldn't be trusted.

While working on my own property I have over 50 contractors come to my property to deposit backfill. Not one of them did what they said they would do. One contractor dumped the tailings from an old landfill on the property. Another bulldozer operator siphoned off the rock loads for himself until I caught him and expelled him from the site. Another just up and walked away from a verbal contract. That same company spilled oil from a truck on the property. Indeed, those in the Construction Industry can't be trusted. It is not just the workers. It's the professionals as well.

My boss who was an engineer stole lumber from the government for the construction of his personal house. And he hired his own backhoe to do work on a project he was overseeing. He associated with one of the subcontractors at the residence.

The President of the company, also was a professional engineer. He pulled a bait and switch on me from engineering school when he hired me for Ottawa and then made me move to Kingston. They had said they would pay for all the expenses necessary for attending to a construction project. This is the same fellow who humiliated his son at the company party by pulling the sting supporting the pieta when the boy was blindfolded. He was a civil engineer.

Considering the efficiency and allocation of risk on lump sum construction contracts, there are some issues that I'd like to draw attention.

The first is that we don't have a Professional Quantity Surveyor's Institute (PQS) that is influential in Canada. The profession is charged with economic savings or cost engineering and quality control among other duties. The PQS is prominent in the UK, but not so in Canada. Those who hold the PQS designation are usually from the UK. A PQS is worth his weight in gold. A lot of estimators in Canada are Civil, Mechanical, or Architectural Technicians.

An owner could benefit by hiring a PQS at the outset of a project. PQS can find value for dollar resulting in better economic efficiency on the construction of a new project. PQS have a large impact on the cost of a project. Indeed, many of the opportunities are lost if not taken before and during the design. Civil Engineers can work as Cost Estimators. The Civil Engineer is the most versatile employee that there is in the construction Industry. They can work as designers, Project Leader; Estimator, Project Manager, Claims Preparer, Construction Manager clerk of the Works, and Inspectors.

Another trend we saw in the 1990's was to get rid of the Site Supervisor on the project and replace him with the Project Manager who was usually a Civil Engineer. This is a bad idea as well. The site needs supervision to keep an eye on the subcontractors. PM's don't have the time to adequately both jobs. The Site Supervisor are usually men who are good with the tools, but not with the paperwork even if he doesn't use the tools. The PM's are good with the paperwork but not the tools. Site supervisors need to keep track of what is going on in the site, things like project safety rules and settling disputes. It would have to be a very small project before the PM could have the time to do both jobs.

Another idea is to go the Design-Build route. Although it is appealing to minimize construction disputes since one contract controls all the work, but there is no architect working for the client or at best independent in construction disputes that inevitably arise during a project. I suppose an Owner could hire a Construction Manager, usually and Architect or Engineer who are professionals and bound to be fair. However, who even is paying him is likely to get the benefit of the doubt. We see this problem with insurance adjuster on an insurance claim.

That brings us to a novel concept from Common Law England.: the Technology and Construction Court or Queen's Bench. To my knowledge, we don't have this set up in Canada. But since there are so many disputes in Construction due its complexity and high stakes, construction comprises a lot of the courts time that needs experts to settle legitimate disputes. This would help evolve the common law precedents that contracts could learn from thus minimizing litigation.

We note that in the traditional contract set up, we have the Owner who contracts with an architect (or Civil Engineer) to design and oversee the construction of a building or civil engineering project.

However, the skill needed by an design architect are different from a construction manager. It is rare than one man has both skills. The same goes for PM's; some is good at paperwork, the other at pushing the trades. It is those who are multifaceted who lead in the industry. And the Project Manager, who should always be a professional Engineer or Registered Architect, is not much good at Estimating. The accountants have the least impact on the bottom line. All the decisions leading to profit have already been made. The accountants simply count the beans after everything is done. They contribute through the profit-making opportunity in the cash flow that they have in paying after 60 or even 90 days after they are paid by the owner certificated by the Architect.

The use by an owner of a construction manager may result in cost saving from 5%-30% by having the Developer contract directly with the subs, but for a job that goes wrong, there is no

one to recover the losses from. The Construction Manager, as opposed to the General Contractors, don't provide bonds.; they don't have the bonding capacity. That essentially is what a general contractor has to offer: bonding capacity. Large General Contractors will finish a project no matter what. GC's should not be so overleveraged that they risk insolvency if one sb claims a large amount. THE GC will thus go under – the worst case scenario.

So his is my take on Construction Managers Litigation, and PQS's. Really, the biggest limitation is that the professionals have skills that may limit them as to what they are good at. I didn't mention that there is also business acumen. It may be profitable to have senior technical, architects and engineers with businessman in their belly to drum up negotiated work.

The most profitable companies in Construction are the design build contractors who own and sell land along with a building such as a whare house. We would call them developers- build to suit. However, land can sit vacant for decades at a great cost with property taxes as well as lost income from having the money tied up in land.

The Project Manager who should be a Civil engineer, have the most impact on the bottom line. Mechanical Engineers don't have training in Construction Management such as producing schedules. Professionals Project Managers who are usually business school graduates have no training in Health and Safety. For engineers, safety of the public is paramount. Business students have no education in design and therefore don't understand the implications of unilateral design changes. Neither do Carpenters.

Perhaps some thing that should be considered is in the very term of "general contracting." No one is a expert in everything. Instead of having general contractors, we should have "Specialists contractors". For example, they may specialize in Hospitals or Airports or Water Treatment Plants. Engineers specialize to Construction Management from Structural, Geotechnical, Transportation etc.). Architect may not specialize either leading to inefficiencies. However, to survive, the General Contractor would have to bid jobs far and afield which is hard on the staff As a result of the present system, the general hires workers from a variety of education and training (Engineers, Technicians, Technologists PQS's etc.)

Mistakes are costly. Then come the Estimators who are usually Technicians in Canada and not PQS have the most influence on making or losing money. Then come the Site Supervisor who is usually a Carpenter. Last place are the accountants who just deal with what they are given in terms of financial investments. The industry, aside from its lack of PQS, has been structured to suit these demands. Who does what depends mostly on talent and secondarily to education.

The last in the list of profit producers are lawyers. On a job gone wrong, lawyers can make more than the entire construction team. However, clients are hard to come by winding up in Technology and Construction Court is the last avenue you want to go to make a profit in the Construction Business. You want to have satisfied customers. A companies reputation is more important than one project's loss.

One thing I never figured out is why a General Contractor has so many accountants floating around who have their arms crossed. If they are looking for people who are not working, they should get a mirror. They tend to go to lunch together. They may busy for one or two days at the end of the month during billing season. They tend to be paid more than Engineers, yet don't

produce mush work. They tend to hang around the Project Accountants while they do nothing. Efficiencies can be gained by getting rid of top-heavy organizations.

Part of the definition of Engineering according to the Provincial Engineers' Act included "the management of constructed works." When we have non-engineers managing constructed works, - at least major works beyond house construction say- then we have people practicing engineering with out a licence. The PEO have neglected this and as a result, we have many construction projects that don't have professional engineers at in the lead role. The PEO are derelict in their duty. Either the case must be enforced, or abandoned.

From my experience, we had a fellow who was a drop out of engineering school after only one week who titled himself as a "Site Engineer." He even went to the trouble to wear an iron ring. His boss, and mine a P.Eng. knew about it but didn't do anything until I complained about it. In the Construction Industry, you can't trust anyone. You must work with them. They drove me out of that industry. There are bullies and even immoral engineers who sleep with their bosses wife and take drugs and stealing from their employers and I collusion with subcontractors. The Construction Industry is not for the faint of heart. It wasn't for me. I'm sorry I took Civil Engineering at University at great cost.

My advice to young aspiring engineers is to take medicine! The Engineering education at UNB was not very good. The professors didn't want us to have to buy textbooks so didn't use on. That is where you gain most of your knowledge as a neophyte. And Engineering education at UNB was better than most. I worked with graduates from all the engineering schools in Canada.

The Construction Industry needs an overhaul. Its they type of person that the industry attracts which is where most of the problems lie. You can't trust anyone in the Construction Industry, including the engineers, no matter how senior they are. Even the presidents of the company, professional engineers are crooks. They can't be trusted. No one can -except the architects.

As a final note, the construction is very competitive. If you are not competitive, you will not survive as a company. The workers are gruff. Women are not suited for it. They are not competitive. They want the reward without the work. And they don't tell you in engineering school that you'll be working with the Mafia if you work in construction in Ontario. I tried to collect on a back charge on the concrete subcontractor. He said he'd make me pay. He'd make my family pay. I said I don't have a family. He got the disgruntled project contractor who passed himself off as a n engineer to poison me with a chemical that makes you sterile at the company party. The construction Industry is full of crooks.

The large company I worked for paid me just above a secretaries salary even though I was managing \$16 M worth of work in 19934 dollars (3 projects) . I had to use my car to run their business. They didn't their equipment for free! as one architect put it. My doctors secretary made more money than I did. We were mandated to work 6 days per week. And we could only refuse to move once in our career. I should have known. My first job, I was paid \$3.50 per hour, or \$132.50 per week. And I had to use my car to operate in the village. All around civil Engineering is for duds. It's a bad deal. The education took me 6 years are \$60 k .It wasn't worth it. It ruined my life. I can't recommend civil engineering as a career. I thought I had earned a house in the suburbs when I graduated. Nothing could be further from the truth. I had

high honours in High School. I could have done anything else I wanted. I tried to find out from engineers practicing what was a fair salary. They wouldn't tell my nor my mother. Stay away from Civil Engineering. And half the class didn't get a job. I was one of the lucky ones!