By Tonia Jurbin, P.Eng.

Digging In

Trenchless technology and shifting risks

How should risk be allocated between owners and contractors on projects involving trenchless technologies Trenchless Technology B.C. sponsored a workshop this summer in Burnaby to explore the risks of these underground utility projects and how those risks might be spread more evenly. The group was addressed by Marina Pratchett, partner at the law firm Fasken Martineau DuMoulin of Vancouver, by Don Moore, P.Eng., manager of utilities and construction for the Corporation of Delta, and by Naresh Koirala, P.Eng., senior geotechnical engineer at EBA Engineering Consultants of Vancouver.

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From a legal perspective Pratchett explained that claims arise from risks that are not clearly identified at the outset of a project, or where the risks are allocated to the party least able to assess them.

The trend in contracts is to add onerous "risk shifting clauses," which sometimes unfairly move the responsibility for the risk to the party least able to insure against it. The responsibility for subsurface conditions, for example, is often shifted onto contractors, even though they are not generally expected to undertake a site investigation before bidding on a project. Owners' engineers take months to design a piece of infrastructure that a contractor is expected to estimate the building costs for within days or weeks. As a result their ability to reasonably assess the risks that they assume are limited. These types of risk shifting clauses account for a high proportion of construction claims and disputes in Canada.

Moore said it makes sense for contracts to be performance based, and unless there are extremes in weather or acts of war (or acts of God), most risks fairly belong with contractors because so much is under their control: material, labour, equipment, site safety, and responsibility for any new methods that they propose to the project owners.

But where is the balance? Moore asked. Is contractual language the only solution to allocating risk in construction? Owners cannot reasonably take advantage of contracts to penalize contractors for a job that is going badly through no fault of their own. Owners who continually hide behind contract language, especially in the case of a utility or municipality, risk losing the goodwill of the contracting community. In Moore's experience, if the risk is unbalanced, the costs of that risk will be built into the contract and the owner will end up paying for the risk whether the event materializes or not. They will face fewer bids that will come in at higher prices. Moore has seen a 10-15% reduction in bid prices since Delta starting practising "cooperative contract administration."

Koirala suggested that uncertain ground conditions typically arise because the subsurface investigations on which ground condition projections are based are statistically insignificant. Even state-of-the-art investigations cannot identify all anomalies. EBA typically drills one hole for every 80 metres of tunnel length. To put that into context, they will typically drill one hole for every 500 metres on open cut projects. Their site investigation is typically 1.5% of the tunneling costs, and they strongly recommend full-time geotechnical inspectors to monitor progress. Daily progress reports countersigned by the contractor include machine downtime and a boulder sheet that records number and size of boulders encountered. This way, should a claim arise there is no dispute in matters of fact.

Koirala suggested that the industry needs a paradigm shift to start allocating the risk in a more balanced way. He encourages his clients to have him issue "geotechnical baseline reports."

"The current practice is for engineers to hand over a geotechnical report with a big disclaimer," Koirala said. "We use language that is vague with lots of "will likely's," "may have's" and "up to's." Then we tell the contractor that they use the information at their own risk."

A geotechnical baseline report is different. Koirala explained: "we use definitive language; we stand behind what we predict, and do not attach a disclaimer. This gives the contractor a baseline on which to base his estimates and his claims. It spreads the risk more fairly." He continued, "There is no such thing as 'changed conditions.' The conditions don't change, just how much we know about them." He presented studies that illustrated a clear relationship between increasing costs of risk and effort with decreasing costs of site investigations.

In Koirala's experience the baseline report is an effective starting point in the search to allocate risk fairly. It is widely used in large tunneling jobs in parts of North America. The question is, can it be more widely used for smaller infrastructure jobs using pipe jacking, pipe ramming and horizontal directional drilling where the obstacles are not necessarily seen and the stakes not quite as high?

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Few contractors interviewed later had ever seen a baseline report but they thought the concept was a good one. All were quick to agree that if they had such a basis for claims, their bid prices would come down. One suggested that the increasing use of risk shifting clauses in the last five years is beginning to drive operators out of the industry, and that with fewer of them around the prices will rise. No matter how you look at the issue, owners will have to pay for the work they need done. The higher costs will come in the bids they get, or in the claims that arise. Another contractor suggested that with contracts becoming so unbalanced, more and more are being successfully challenged in court. The status quo is adversarial and not sustainable.

In summary, the conference showed that the industry is still struggling to find a fair way to allocate risk in trenchless projects. Designers and contractors especially agree that owners have to be educated about the limitations of geotechnical investigations, and that the 10% contingency typically allocated in construction estimates is not enough for most trenchless projects. **CCE**

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** Louisiana Tech University's Trenchless Technology Center defines trenchless technology as "a large family of methods used for installing and rehabilitating underground utility systems with minimal surface disruption and destruction resulting from excavation."*