

APPROPRIATE ALLOCATION OF RISKS IN
GEOTECHNICAL ENGINEERING

by

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One of the major causes of claims advanced against geotechnical engineers arises because geotechnical engineers assume risks in construction projects that should have been allocated to or left with other parties connected with the project.

Statistics indicate that one out of three engineering firms in Canada will be involved in litigation sometime during its lifetime. The incidence of claims or lawsuits being commenced against geotechnical engineering firms is considerably higher than this statistic. Geotechnical engineering, from the claims aspect, is one of the high risk disciplines in the engineering profession. This high risk to claims is created because in many cases the geotechnical engineer is involved in investigating and reporting upon the unknown. It has been said that the only time a geotechnical engineer can truly ascertain what is below the surface is when there have been enough drill holes put into the site such that the site is totally excavated. The purpose of this paper is to highlight, for geotechnical engineers, some of the risks to claims and identify some of the solutions, such as the use of properly prepared contracts and the appropriate application of professional liability insurance.

ALLOCATION OF RISKS

The subject of risk allocation was considered by Ron Nairne, who was a principal of McCarter, Nairne Architects and laterally a lawyer practicing with the writer. Mr. Nairne wrote a series of articles in the B.C. Professional Engineer in 1983. The concept of risk allocation and risk transfer as developed by Ron Nairne is briefly discussed below.

One of the first pieces of information that is necessary with respect to the construction of any project is subsurface conditions. The geotechnical engineer is usually retained by the prime consultant. In some cases the geotechnical engineer is directly retained by the owner/developer. It is the writer's personal opinion that the contract entered into between the geotechnical engineer should be directly with the client, with the prime consultant having the right to coordinate the geotechnical consultant's work. There are two reasons why this approach is advantageous to the geotechnical engineer:

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1. He bills the client directly and thus the fees are not dependent on the prime consultant; and
2. He is generally only responsible, pursuant to his contract, to the owner. This arrangement may avoid a claim from the prime consultant if the prime consultant is sued.

This arrangement allows the geotechnical engineer to directly advise the owner/developer of the nature and extent of an appropriate geotechnical program and the cost of it. Thus the owner/developer is fully apprised of the necessary service and what will be the cost of the services. The information to be provided by the geotechnical engineer is usually coordinated with the prime consultant at the site.

The geotechnical engineer upon retention normally performs his services by obtaining drill cores, test pits, taking samples and performing such tests as are deemed necessary. From this information is extrapolated the nature of the site. The information that is eventually provided to the client is of necessity the best estimate and of course is speculative because it is extrapolated from samples.

The point to be remembered throughout all of this extensive testing, sampling, etc., including its cost, is that the property was purchased by the owner/developer and he has assumed all the risks that are associated with that piece of property. The object of the geotechnical engineer's service is to leave that risk with the owner/developer unless the geotechnical engineer is handsomely paid to accept the transfer of it. In many instances the owner/developer has purchased an inexpensive piece of property. The reason why the property was inexpensive is because there are many hidden risks and unknowns. For example, in Burnaby there may be many feet of peat under the surface, thus increasing the cost of utilizing the property without risk. Therefore, in order to have a piece of property which can be used, it is necessary to expend funds on foundations and footings, which increases the cost of the property which many owners/developers wish to avoid.

It is at this point in the development process that a strange event occurs, namely the transfer of risk by the owner/developer to the geotechnical engineer. This transfer of risk occurs when the geotechnical engineer unnecessarily, improperly and incorrectly assumes and accepts the transfer to himself of the risks for all the unknowns contained below the surface. The following are some typical examples.

In one case there was a project which required the installation of a water system through a peat area. The geotechnical engineer provided his advice which indicated the

nature of the soil conditions, but suggested that it might be possible to get by with the use of PVC pipe. The purpose of this recommendation was an obvious attempt to save the owner from taking the step of incorporating in his design cast iron pipe which the engineer knew would be satisfactory. The PVC pipe was installed and moved and broke. The next attempt was again a recommendation by the engineer to hopefully save the owner money. In this instance the recommendation was to change from PVC to blue brut pipe. This also was a saving in expenditures over the use of cast iron pipe. Upon installation the blue brut pipe failed. In the end the engineer eventually recommended and the owner approved the installation of cast iron pipe which was the appropriate material. The owner then advanced a claim for the remedial costs including the delay cost occasioned by the engineer's negligent design and advice. The engineer's argument was made that the owner was fully apprised at all times but nothing had been committed to in writing. The owner took the position that he totally relied on the advice of the engineer who had assumed the risk of installing PVC and blue brut pipe. In the end the owner was successful and the engineer was required to pay a substantial sum to cover the financial loss incurred by the owner.

In this case the engineer while attempting to be helpful had unnecessarily and improperly assumed the risk of the poor site. In accepting the risk the engineer had relieved the owner of the responsibility for having selected and purchased that specific site. The solution was to have left the risk of the peat with the owner. This allocation could have been accomplished as follows.

The engineer should have advised the owner in writing that the best but most expensive choice was cast iron pipe. The engineer should have advised the owner that there were other less costly alternatives, namely, PVC and blue brut. The engineer should have detailed in writing the cost savings to install the alternate materials. The engineer should also have advised the owner in writing that he could not guarantee that if the installation incorporated PVC or blue brut that they would be effective, but that if the owner wished to accept the risk, then these products could be installed. Thus, if the engineer had followed this procedure and obtained the owner's confirmation and acceptance of the risk of using less expensive materials, in writing, then no liability could flow back to the engineer providing he had obtained and properly explained the risks being accepted and acknowledged by the owner.

In the above example the engineer failed to take these steps and in effect transferred and allocated the risk of the site to himself when in fact none of this transfer was necessary.

Another example of risk allocation occurred in the well known case of the District of Surrey v. Church and Carroll-Hatch. The structural engineer asked the architect to obtain the owner's permission to obtain a soils report. The architect declined because he believed the owner would not pay for an additional soils report. As a consequence one of the engineers employed by the structural engineer provided "a form" of soils report. The report was inaccurate and the owner suffered loss. In this case both the architect and the engineer accepted a risk that belonged to the owner. The court found that both the architect and the engineer were in breach of their duties to the owner. The structural engineer was found liable because he failed to inform the owner directly that he needed a soils report. He therefore committed a negligent act by providing a soils report when in fact he was a structural engineer.

The obvious solution to this problem was for both the architect and the structural engineer to ensure that the owner was advised of the necessity to obtain a soils report and the risks inherent in not obtaining one. If these risks had been properly explained to the owner, the owner would in all probability have recognized the necessity for the soils report and obtained same regardless of the cost. In any event the risk would have been appropriately allocated, namely, with the owner and not transferred and allocated to the professionals.

In both of the above cases the solution was quite simple, namely, advising the owner in writing and ensuring that the risk remained with the owner.

Geotechnical engineers appear to have a strange form of death wish when it comes to accepting the transfer of the risk to themselves. This occurs perhaps because of the competitive nature of the business and the fact that the geotechnical engineer appears to be the easiest person in the construction process upon whom to transfer the risk, and is asked for a budget to perform the services required to investigate the site. For some reason the geotechnical engineer almost always underestimates the cost of the services and perhaps this is for the purpose of being conservative and holding down the investigative costs. It is my suggestion that the owner should be advised and apprised of the best and most appropriate method for performing the geotechnical services, and should be so advised in writing. If the owner wants to reduce in any way the necessary geotechnical services then he should be so advised that this may increase the probability of a claim, loss or failure, and that the risk of such claim, loss or failure is to be borne by the owner. If all the geotechnical engineers follow this process then not only would your fees for services performed be increased, but your claims for negligent services would be decreased.

CONTRACT DOCUMENTS

In many instances the risks of subsurface conditions (in some cases, after being shifted to the geotechnical engineer) are attempted to be transferred or shifted to the contractor through the provisions in the contract documents. This approach is quite simple and it is known as the use of the "weasel clause". These clauses purport to disclaim all responsibility for the soils investigations and reports while requiring the contractor to conduct such investigations as it deems necessary in order to ensure the adequacy of the site and soils conditions. Again, this is an improper attempt to shift the risk to the contractor from the owner. These disclaimer clauses merely increase the project costs, not only to the owner, but to all the parties involved. The simple solution is for the owner to have been advised at the outset in writing of the necessity of expending the appropriate funds on the soils investigations so that the owner/developer is in a position to assume that risk when it deals with the contractor.

In most cases the courts are reluctant to enforce the disclaimer or weasel clauses and have come up with myriad methods to avoid them or render them ineffectual. The courts get around these clauses by adopting concepts such as precontractual misrepresentation and contractual representation with respect to the soils investigations.

It is therefore my suggestion that in adopting this type of approach, namely the use of weasel clauses, that no one benefits and everyone loses, and the project costs are increased. The appropriate solution is to advise the owner at the beginning of the project as to the necessary and proper geotechnical services required on the project, and to ensure in writing that if the owner wants modification or alteration of these services that he retains and accepts that risk.

INSURANCE

One of the most effective methods to protect professionals against claims, not only contractual claims but third party claims, is the use of professional liability insurance. There are two ways in which insurance can be used to reduce the risks on construction projects. These are as follows:

1. The obtaining of a project policy paid for by the owner in relation to the specific project.
2. The use in the contract between the geotechnical engineer and the client of a limitation of liability clause which limits the liability of any claim made by the client against the geotechnical engineer to the value and amount of insurance carried by the geotechnical engineer at the time the claim is made.

By following the above two steps you can greatly reduce the amount and value of the claims being made against you.

CONCLUSION

In conclusion the basic message in all of this is that the risk should be left with the person most able to deal with it. In most cases involving geotechnical engineers the risk should be left with the owner/developer of the property. They are the parties who have purchased and acquired this piece of property. There is no intelligent reason for the geotechnical engineer to assume the risks of the owner/developer's property unless you have been adequately compensated for accepting this risk. This means that your fees should be increased proportionate to the risk you are accepting, and then, and only then, should you be prepared to accept the transfer of this risk from the owner/developer to the geotechnical engineer.