

A/E RISK REVIEW

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Risk Management Principles for Geotechnical Engineers

The following material is provided for informational purposes only. Before taking any action that could have legal or other important consequences, speak with a qualified professional who can provide guidance that considers your own unique circumstances.

When it comes to professional liabilities, geotechnical engineers have long suffered a bad reputation. Why so? Is the reputation earned? Just how bad is it?

Historically, geotechs were considered the professional liability (PL) scourge of the design professions. Indeed, there have been times when it has been nearly impossible to find an insurer willing to write a PL policy for geotechnical engineers. And when insurance could be found, it was exorbitantly expensive and often full of coverage holes.

Over the years, things have improved quite a bit. Thanks to efforts by the Geoprofessional Business Association (GBA), its predecessor, the ASFE, and other professional associations, risk management and loss prevention efforts have been brought front and center.

Why are geotechs considered such a high risk?

First, it's the nature of the services they provide. Geotechnical engineers are charged with determining the stability, movement, composition, stress-bearing capacity and other conditions of the soil and rock that are hidden beneath the surface of a construction site. The presence of natural obstacles such as underground water, large boulders or sinkholes, as well as man-made obstacles such as underground storage tanks and hazardous waste dump sites must be ascertained. While advancements in sampling, testing, probing and modeling technologies have been rapid, this is still an inexact science. The geotech must test selected portions of the geography and extrapolate those findings into a reliable evaluation of the entire subsurface of the site. Any unanticipated subsurface condition can result in project delays, budget overruns, and eventually disputes and claims.

Second, there is the severity of the potential damages should something go wrong. A geotech's services are key to a solid foundation for any project, literally. Soil movement or other instabilities or obstacles that are discovered during construction or, worse, after construction is complete, will likely have very

expensive repercussions including risks to lives, property and the environment. Soil instabilities may not become apparent until years after project completion. Correction may involve extensive retrofitting of the core of the building or deconstruction and reconstruction of major structural components. Consider the leaning and sinking Millennium Tower of San Francisco: No easy fix there.

So what is a geotech to do? More specifically, how does he or she manage the professional liability risks of geotechnical engineering? Here are some important keys to consider.

Deliver Quality Services

Geotechnical engineering is a constantly evolving practice, one that demands that the geotech stay current with methods and technology. Geotechs who earn a four-year engineering degree, add a masters degree and maintain professional accreditation demonstrate dedication to their craft. Continued education regarding the latest industry trends is essential.

Building a strong reputation for thoroughness and accuracy in services delivered and giving clients detailed but reasonable recommendations is indicative of a quality geotech. Knowledge of and experience with the area geology is highly desirable. Quality geotechs will maintain detailed records of soil and geologic information based on their and others' previous local projects. This inside knowledge will include historic records of soil types and movements as well as how obstacles and anomalies have been successfully handled. For instance, local soil movement might have been better rectified in the past through excavation and replacement, as opposed to soil stabilization.

Include A Full Scope of Services

Unfortunately, project owners are often reluctant to spend a lot of money on geotech services and will fight for a limited scope of services. Part of the problem is that these clients can't see a physical result of such services, such as a flashy architectural design or a dramatic bridge rendering. Indeed, the best-case scenario with a geotechnical subsurface examination is that there is nothing to see. Why, clients will question, do I have to spend so much time and money for a largely invisible benefit?

Clients need to be convinced that a full scope of geotech services is essential to identifying the existence of, or lack of, problematic subsurface conditions. They need to understand that a limited scope of services creates unnecessary risks that can threaten the entire project. The dollars saved by cutting back on geotech services are miniscule compared to the potential added risk. Clients also need to be made aware that providing a limited scope of services creates significant risks for the geotech in exchange for

a nominal fee. Should subsurface problems be discovered following an inadequate subsurface investigation, the geotech may be found in violation of the prevailing standard of care and guilty of errors and omissions.

When it comes to developing the recommended scope of services, the geotech should take the lead, with the other design firms and the client participating in the process. It should be up to the geotech's professional judgment to determine where and how to examine the jobsite. The geotech should recommend:

- How to take samples, where to take samples and how many samples should be taken
- What further testing and subsurface explorations should be conducted
- How results should be interpreted
- What reports should be issued, and to whom
- What recommendations shall be made based upon the test results.

The geotech's recommendations should serve as guidance to the lead designer, structural engineer, civil engineer, mechanical engineer and other designers regarding how they respond to subsurface conditions. For example, the geotech may recommend certain types of site preparation activities and foundation designs, explaining the benefits of the recommendations and why alternate actions and designs may be risky on this particular jobsite.

It is highly recommended that the geotech's scope of services include a review of all design elements relative to the geology of the site. This would include designs for foundations, embankments, paving and earthworks. Likewise, the geotech should have a role as project representative during site preparation and construction, helping determine whether the contractor is following design intent and alerting the client if discrepancies arise. Equally important, by being on the jobsite, the geotech can help analyze any unanticipated geological hazards that arise and plan corrective actions in an expedient manner.

Make the Geotech Part of the Team

In too many instances, the geotech does not have a seat at the table when it comes to the project design team. Worst case, geotechs are hired to give limited subsurface examinations knowing only the bare basics about the project. Once their report is delivered, they have little if any communication with anyone on the project team. From a risk management standpoint, it is critical that the geotechnical engineer have the ear of all major project participants. From the inception of the project, the geotech should meet with the client and the rest of the design team as equal partners to discuss project goals, objectives and concerns. This is essential for the geotech to accurately determine the amount, type and locations of testing and sampling needed. It gives the geotech the opportunity to ask and field questions, explain his or her recommendations and discuss the pros and cons of any alternative recommendations suggested by the client or the other team members.

Team site visits before any groundbreaking begins can be particularly helpful in building clear communications and cooperation. Once design begins, the lead architect and key engineers should now feel more comfortable sharing their plans

and specifications with the geotech and more open to suggestions. Keeping the geotech on the team through construction, responding to any design or specification changes that could demand added exploration or testing, helps avoid expensive missteps.

One interesting trend we've seen is an increase in projects where the geotech contracts with and reports directly to the lead designer, rather than the project owner. This arrangement can be problematic in that it may disrupt the direct communications between the geotech and the client. Furthermore, it creates vicarious liability for the lead designer, who can now be held responsible for the geotech's actions. It is generally preferable for geotechs to contract with and report to the owner so that they can hear the client's needs firsthand and hold more sway when reviewing design options or visiting the jobsite with the design team.

Have Appropriate Contract Language

Whether the geotech is hired by the project owner or the lead designer, solid contract language is a crucial component of risk management. The contract should address issues such as the geotech's standard of care; certifications, guarantees and warranties; a means-and-methods-of-construction waiver; third-party beneficiaries; indemnifications; insurance requirements; dispute resolution methods; and other basics of risk management that we constantly preach in our role as risk advisor.

For geotechs, the scope of services definition in the contract is of utmost importance. (A good starting point is AIA Document C202™, *Standard Form of Consultant's Services: Geotechnical Engineering*.) Geotechs should be sure to spell out specifically what services they are hired to perform. But they shouldn't stop there, especially if they have been hired to perform a limited scope of services. It is advisable to also list:

- 1) Those geotech services that have been recommended, but that the client has turned down.
- 2) Those geotech services that have been offered but are specifically excluded because they are being performed for the client by someone else.

Again, let us emphasize the danger of a geotech performing what he or she considers an inadequate scope of services for a client. If a client insists on skimping on the budget and foregoing what the geotech considers necessary services, the geotech should note so in the contract, specifically naming the services that the client has refused. Then a *Limitation of Liability* (LoL) clause should be tied to this statement. The geotech should state that due to the risky nature of the limited scope of services he or she is being asked to perform, liability for errors or omissions will be limited to a specified amount. That specific amount can be tied to the fees made on the project, the available professional liability insurance limits at the time of a judgment, or some other quantifiable number. If a client refuses to include an LoL clause, then the geotech has a risk-vs.-reward business decision to make regarding whether to accept the limited-scope project.

Get Adequate Insurance

Today, professional liability insurance is readily available to geotechs, but it can be expensive. Different PL insurance carriers have different underwriting appetites for geotechs, so it's important to explore options. We can help.

Geotechs shouldn't select PL insurance just on price. Because of the long-tail nature of their liabilities, geotechs will need policies that can be kept in force for years to come. They should look for a PL carrier that understands the unique risks of geotechnical engineering and that has a long history of serving the A/E market. Be aware that the minimum annual limits demanded by most clients has been \$2 million, but lately we've seen them rising to as high as \$5 million.

For geotechs, as with all design professionals, following the basics of risk management can help avoid project upsets and claims and keep down the cost of professional liability insurance. The insurance market is much better than in the past and we'll be happy to help geotechs find a carrier to fit their needs.

Can We Be of Assistance?

We may be able to help you by providing referrals to consultants, and by providing guidance relative to insurance issues, and even to certain preventives, from construction observation through the development and application of sound human resources management policies and procedures. Please call on us for assistance. We're a member of the Professional Liability Agents Network (PLAN). We're here to help.