



## Guidelines for the Use of Geotechnical Reports

This document identifies problems with the practice of referencing the geotechnical report in the construction documents and makes recommendations to limit the structural engineer's liability and to address the structural engineer's concern that the geotechnical issues be addressed. This effort has been coordinated with local and national geotechnical professional organizations.

Geotechnical engineers<sup>1</sup> prepare geotechnical reports<sup>2</sup> to convey:

- information about their site-subsurface exploratory findings<sup>3</sup>, to help owners and others determine the feasibility of a proposed project;
- their confirmation-dependent recommendations used by the structural engineers for substructure design; and
- recommendations for earthwork, grading, and soil improvement for consideration by Owner, design team, and others when designing a structure and appurtenances and preparing the construction documents.

The geotechnical report does not typically provide all the technical information related to materials, processes, and testing and inspection programs that need to be addressed in the contract documents.

Because the geotechnical engineering scope is often established before initiation of the design phase of a project, geotechnical engineers commonly use their geotechnical reports to provide the design team with options for foundation systems and the earthwork operations. The geotechnical report is intended to facilitate a design process that involves the geotechnical engineer and where the geotechnical engineer is able to verify that the final design is consistent with the geotechnical engineer's recommendations. In this context, the final technical information about materials, processes, and testing/observation programs are defined and documented in the construction documents and as a result this information is typically not included in the geotechnical report.

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<sup>1</sup> While under state law Civil Engineers and other individuals may have the authority to prepare geotechnical reports the term "geotechnical engineer" is used to refer to the individual practicing geotechnical engineering as opposed to an individual who has the title of a Geotechnical Engineer.

<sup>2</sup> During the design of a project the geotechnical engineer may issue a letter supplementing the geotechnical report. Any references to the geotechnical report should include both the original report and all supplemental letters issued to date.

<sup>3</sup> Sometimes the documentation of the existing geotechnical conditions is contained in a Geotechnical Data Report. In these situations the geotechnical engineer's recommendations are contained in a separate Geotechnical Interpretive Report.



Because geotechnical reports typically offer multiple options, they are not written in mandatory language and thus are often subject to multiple interpretations. This is not a problem when used as part of the design process described above however if the geotechnical report is used as a construction document by the contractor to the risk of construction claims or technical problems will likely increase. Attempts to resolve this problem by writing a geotechnical report that could also be used as part of the construction documents would result in a document ill-suited for its primary purpose.

For these and other reasons, CalGeo<sup>4</sup> and the Geoprofessional Business Association<sup>5</sup> (GBA) recommend that geotechnical reports be excluded from the contract and hence construction documents. (Nonetheless, CalGeo and GBA do recommend making the geotechnical report available to constructors ó for informational purposes only so that constructors have access to the same geotechnical data available to the owner and the owner's consultants, reducing the likelihood of successful claims for change orders because of unanticipated subsurface conditions.)

Structural engineers recognize that the performance of the foundation and hence the complete building is dependent on the adequacy of the ground on which the building rests. The structural engineer is concerned that the recommendations in the geotechnical report are implemented to help avoid problems, claims, and undue liability. This is of particular concern on small projects where the geotechnical engineer is often not a participant in the design process and as a result does not author or edit the earthwork, grading, soil improvement, or other geotechnical related specification sections.

The lack of participation of the geotechnical engineer in the design process has resulted in other members of the design team being pressured to author these specification sections based on the geotechnical report. Structural engineers typically do not want to author these specification sections because they recognize they do not have the necessary expertise. In either event, the lack of participation of the geotechnical engineer can lead to the production of construction documents that do not adequately address the geotechnical issues.

When specifications are written by someone other than the geotechnical engineer, problems may arise when the wording of the specifications is different than in the geotechnical report or when the geotechnical report does not fully address issues that need to be addressed in the geotechnical specifications. Language from master specifications may introduce inappropriate requirements. In these situations, the preparer of the specifications becomes liable for the content of the specifications. Costs associated with resolving any problems will be borne by the owner, but the blame for these inconsistencies will likely fall to the structural engineer who acted as the preparer of the geotechnical specifications.

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<sup>4</sup> CalGeo is a professional organization of geotechnical engineering firms practicing in California.

<sup>5</sup> The Geoprofessional Business Association (GBA) is a national organization of geoprofessional firms. The GBA was previously known as ASFE.



To compensate for the lack of geotechnical input to the construction documents, some structural engineers have added a note on their drawings to the effect that the contractor must comply with the recommendations in the geotechnical report. These shortcut directives are dangerous: They make the geotechnical report into a construction document forcing constructors to use geotechnical reports for purposes the reports were not intended and as a result making costly construction problems far more likely. A structural engineer who decides to convert the geotechnical report to a construction document can be regarded as the *de facto* geotechnical engineer, the structural engineer, not the geotechnical engineer, becomes personally liable for the consequences. Obviously, this significantly increases the liability exposure of the structural engineer.

The consensus among the geotechnical professional organizations is that the solution to this problem is for the owner to engage the geotechnical engineer to prepare construction documents dealing with the recommendations contained in the geotechnical report. This would typically consist of authoring or editing specification sections for grading, earthwork, excavation, and ground improvement. Specification sections dealing with deep foundation elements, earth retention systems, or specialty systems may be authored by the geotechnical engineer or produced in cooperation with the project's structural engineer. When the structural engineer becomes aware that this has not been done the structural engineer is encouraged to raise this issue with his Client and point out that failure to involve the geotechnical engineer will create risks for all involved. Attempts by the structural engineer to unilaterally fix the problem will not address the underlying problem and will unnecessarily expose the structural engineer to greater liability.

It is considered good practice to have the geotechnical engineer review the final construction documents to determine whether the design is consistent with the recommendations in the geotechnical report. As a result, many structural engineers recommend to their client that the geotechnical engineer be provided with a complete set of construction documents and be requested to perform this review.

While the structural engineer should not require that the contractor comply with the geotechnical report, it is appropriate for the engineer's documents to refer to the geotechnical report as the design basis of the foundation system, including allowable capacities and loads.

On smaller projects where notes on the drawings are used in place of formal specifications and where the earthwork, grading, and foundation work is minor in nature, one strategy could be to place the relevant geotechnical requirements on one or more separate drawings that the geotechnical engineer could seal and sign. The architect or one of the consultants on the project could act as a drafting service to produce the CAD files if the geotechnical engineer does not have the resources. Ultimately the decision should lay with the geotechnical engineer on how to present the information. The goal is that the construction documents, including drawings and



specifications, should provide the necessary geotechnical information and should be coordinated so there is no ambiguity.

Prepared by SEAONC Professional Practices Committee - May 2015

Mark Gilligan, Chair 2014-2015

Mehri Ansari  
Richard Bauman  
David Kane  
Joshua Kardon

Thor Matteson  
Jeffery Taner  
Nancy Tennebaum

STRUCTURAL ENGINEERS ASSOCIATION OF NORTHERN CALIFORNIA  
575 Market Street, Suite 2125  
San Francisco, CA 94105-2870  
Phone: (415) 974-5147 Email: [office@seaonc.org](mailto:office@seaonc.org)  
<http://www.seaonc.org>

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