GEOTECHNICAL EVALUATION REPORT GUIDELINES
GEOTECHNICAL EVALUATION REPORT (U.S. and CANADA)

Client’s Representative Instructions
This guideline, and the geotechnical evaluation report template, should be given to the geotechnical engineer each time a geotechnical evaluation report is requested. This guideline and the geotechnical evaluation report template can be obtained from the AEC website at http://aec.ldschurch.org/aec

Geotechnical Engineer Instructions
The client requests that a professional or registered geotechnical engineer perform a subsurface geotechnical evaluation and prepare a geotechnical evaluation report.

The report shall bear the geotechnical engineer's stamp and seal.

The client requests a minimum of three (3) hard copies and an electronic PDF copy of the report.

Before starting the evaluation, a proposal of expected costs based on the scope of services requested should be submitted to the client’s representative.

The geotechnical engineer is expected to adjust the method and magnitude of field testing and laboratory work to technically satisfy the client's needs based on the site, water, and in-situ soil conditions, and the type of building or project to be constructed.

Under separate contract with the project architect prior to bidding a construction project, the geotechnical engineer will be required to review the project construction documents to verify that the report recommendations have been accurately interpreted and implemented into the contract documents.

A letter will be required to be submitted to the project architect, with a copy to the client's representative, stating the review has taken place and that the project construction documents are in compliance with the geotechnical evaluation report recommendations.

All buildings, except grain silos or custom buildings will be single story without basements.

Design Criteria. The following anticipated design loads apply to the Project:

Building:
1) Wall loads will be between 2,000 plf and 4,000 plf.
2) Column loads will be between 10,000 pounds and 60,000 pounds.

Parking Areas and Driveways: Design for light volume of automobiles and light trucks, occasional medium weight trucks and occasional heavy weight trucks. This is approximately equal to a design equivalent single axle load (ESAL) value of between 10^4 and 10^6 (medium traffic) over 20 years:
1) Parking: Six (6) equivalent axle loads per week
2) Driveways: Fifteen (15) equivalent 18 kip axle loads per week
3) Trash enclosure approach slab: One (1) 40,000 pound axle load per week
4) Design life: 40 years (minimum)

General Conditions
The geotechnical engineer is expected to provide and maintain insurance holding the client harmless during all phases of the work required to execute the requested service.

The geotechnical engineer shall exercise reasonable precautions to prevent property damage and restore the site to prior existing conditions.

The geotechnical evaluation report should be completed within four (4) weeks from the notice to proceed unless the geotechnical engineer indicates otherwise in the proposal.

Boring Locations, Depth, and Methods
- Take a minimum of three (3) test borings (or use test pits) 20' deep (or as recommended by the geotechnical engineer) within the area of the building footprint, including future phased additions, up to 16,000 square feet. Provide one (1) additional test boring for every 10,000 square feet of building area, or portion thereof, above 16,000 square feet. If unusual conditions exist, or drilled piers or pilings are anticipated for the building, then the number and depth of borings should be adjusted.
- Take a minimum of one (1) test boring (or use test pits) 6' deep (or as otherwise recommended by the geotechnical engineer) for every 20,000 square feet of parking area for pavement design with a minimum of three (3) test borings.
- Take undisturbed soil samples every 2.5' to 5' or at each change in stratum, whichever requires the greater number.

Adjust the boring depths for anticipated site development cuts and fills as shown on the preliminary site plan provided by the client’s representative and as needed to provide a liquefaction analysis.

Space borings evenly throughout the building and parking areas.

Cost and Billing
The cost of services must be approved by the client’s representative prior to proceeding with the evaluation.

When services are complete, and the written and electronic
reports have been received by the Client’s representative, the invoice should be submitted to the Client’s representative for payment.

Geotechnical Evaluation Report Requirements

Local Conditions and Land Use Data/History:
- Site elevation (USGS)
- Frost depth
- Seismicity and seismic coefficients
- Site class
- General description of the site
- Present use of land and condition
- Any on-site fill including type, depth, date placed and state of compaction
- Description of structures (past and present), condition of structures to remain, basements and buried tanks

Site Water and Drainage:
- Water table depth including a description of seasonal fluctuations
- A description of the site drainage and any drainage problems. Provide a description of any drainage onto the site from other properties and where water from the site drains.
- As requested by the Client’s representative, a percolation test for a septic system drain field is to be completed and the test location shown in the report

Topsoil Testing:
- Provide topsoil testing whenever more than 5,000 square feet of area will be landscaped.
- The Topsoil Testing Report form is to be used by the geotechnical engineer to tabulate the testing data. No other format is acceptable. Imported topsoil is to be tested and approved prior to being installed.

Geotechnical Evaluation Results:
- Use the Geotechnical Evaluation Report Template for the basis of the geotechnical evaluation report
- Site plan provided by the Client’s representative showing test boring locations
- Record boring logs in the report indicating top of test boring elevations
- Identify all soils according to the Unified Classification System

In addition, when site conditions dictate, determine:
- By sieve analysis, percent passing the number 200 sieve
- Atterberg limits: Liquid limit, plastic limit, plasticity index
- Consolidation, settlement, collapsible or expansive nature of on-site soils, with changes in moisture content and intensity of loading at footing locations, such as in-situ or engineered fill
- In-place density and natural moisture content of each stratum from undisturbed soil samples

Recommendations and Conclusions:
- A description of the general suitability of the site for the Client's intended use.
- State general precautions and limitations including soil sulfate content and type of cement
- Possible foundation systems in the order of preference, outlining advantages, bearing capacities, settlements, and relative cost comparisons.
- Recommended bearing depth of footings.
- Provisions to mitigate the effects of expansive soils, collapsible soils, liquefaction, differential settlement, varying soil strength, and adjacent loads. Provide mitigation measures.
- Expected total and differential settlement
- Special design and construction provisions for footings or foundations founded on collapsible or expansive soils, if necessary.
- Recommended precautions to protect structures from damage due to seismic loading.
- A list of amendments, if any, required if using on-site materials as engineered fill.
- Compacted fill material properties and testing requirements.
- Recommended slope stabilization and lateral earth pressure values for retaining wall design, with and without seismic loading.
- As requested by the Client’s representative, determine subgrade permeability for pervious concrete pavement design.

Parking Pavement Design:
- Recommended pavement design for asphalt and concrete indicating preference for the project. Provide recommendations for base thickness and preparation, subbase thickness and preparation, and subgrade preparation. Note any special conditions.
- Determine and state CBR or Hveem R values where thicknesses are not dictated by the Client’s minimum thickness requirements. The Client requires a minimum asphalt pavement thickness of three (3) inches over six (6) inches of base. The minimum concrete pavement thickness is four (4) inches over four (4) inches of base.