

211 – Subsurface Investigations

211.1 Subsurface and Foundation Investigation for Capital Construction Projects: On Capital Construction projects the Architect-Engineer shall coordinate with the Project Manager on the requirements for subsurface investigations. On larger projects these investigations may be approached in two phases.

- The first phase is to be initiated in Pre-Design or early Phase A with the intent of providing preliminary information for the Phase A design.
- The second phase investigation, at the beginning of Phase B, is intended to give more detailed information for foundation design and special site conditions.

The Architect-Engineer shall provide the recommended locations for subsurface core sampling and other similar testing that are required by the Project.

The subsurface investigation shall be made available to the Architect-Engineer for use in the foundation and structural design, and site grading and drainage of the building project. This information shall be included in the specifications and made a part of the contract documents.

211.2 General Requirements: This section outlines the general requirements and content of the Subsurface Investigations Report that will be required for the work necessary in the design and advance planning of the Project.

DFMS will hire a firm that will develop a comprehensive Subsurface Investigation Report. The Architect-Engineer shall contact the engineering firm and arrange for the subsurface investigation.

211.3 Purpose: The purpose of the subsurface and foundation investigation is to provide information on subsurface conditions and give the Architect-Engineer a basis for the structural design of the facility. It also provides the Architect-Engineer and the construction contractor a reasonable basis for cost estimation, including, but not limited to, the following information:

- The elevation of rock likely to be encountered in the excavation of the project, including the installation of utility lines, the nature of such rock and the probable method required for removal.
- The probable extent of unsuitable fills or other material requiring removal or special design consideration.
- The stability and bearing pressure of soils and rock encountered and the recommended type of foundations suitable. The Architect-Engineer shall supply to the subsurface engineer information on probable loading of the structure.
- The likelihood of caverns or interstitial layers of clay or other soft material below the surface of rock affecting the structural design of the project.
- The probability of seismic conditions, mudslides, subsidence or other external factors affecting the site.

211.4 Content: The basic content of the Subsurface Investigations Report shall be as follows; however, specific project requirements may modify the content requirements:

- Provide a general site description and discussion of borings in relation to plan geometry.
- Discuss the geology of the locale.
- Indicate the methods used in the investigation and why the methods used were chosen.

- Present the results of the subsurface investigation and laboratory testing and offer recommendations for the design of foundations, pavements, and other structural features.
- Provide logs of borings and soundings.
- Reference all borings and soundings to the project baseline.
- Ensure that at least one boring extends to bedrock or to a minimum depth of 50 feet.

The report shall provide the following recommendations based upon conclusions reached from the borings:

- Soil bearing capacities.
 - Soil infiltration rates - if required for LEED certification.
 - Foundation design.
 - Recommendations for site preparation and site drainage.
 - New embankment material.
 - Footing excavation and placement.
 - Sub-grade preparation for slabs.
 - Information relative to any site condition that could endanger the constructed facility (i.e.: the possibility of soil movement or excess water encroaching on the site).
 - Pavement sub-grades design for rigid and flexible pavements and the allowable design CBR and modulus of subgrade reaction parameters. Guidance shall be offered on the types of base course materials available in the area and design strengths.
 - Water table information.
 - Location of fill or dump areas near site which may jeopardize foundation.
- Existing buried utilities that may conflict with new foundation.

211.5 Report Submittal and Distribution Requirements: The completed report shall be provided on 8-1/2" x 11" white bond paper. Large format (24" x 36") sheets may be provided for boring logs and other related drawings.

The large format sheets shall bear the DFMS title block. This title block shall contain all information contained on the title blocks of the Architect-Engineer created sheets.

The Subsurface Investigations Engineer shall coordinate the sheet size with the Architect-Engineer so that the sheets fit into the Architect-Engineer created set of construction documents without alteration.

The distribution is to be as follows, unless specifically indicated in the authorization letter:

- One electronic copy and one bound copy of the report to the Project Manager.
- One electronic copy of all information to the Architect-Engineer.