

Risk navigator

Geotechnical reports



Construction

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About Markel's Risk Solution Services team

Risk Solution Services provides technical insight related to existing and potential insured risk at Markel. The team partners with our customers, claims, and underwriters to educate on both current and future risk trends and supports our clients with a comprehensive offering of risk management solutions.

We do this by engaging with clients, underwriting, and claims teams.

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What is a geotechnical report?

A geotechnical report, commonly known as a “soils report,” is a generic descriptor used to describe reports (e.g., foundation reports, centerline soils reports, landslide study reports, etc.) that provide information regarding soil, rock, and water conditions. They are used to communicate subsurface conditions, design information, and construction recommendations to construction and design personnel. They are the direct result of the interpretation of site investigation information by a geotechnical engineer.

Construction engineers require these reports to understand geotechnical related issues such as earthwork, foundations, bearing capacity for footings, and design loads for caissons. The information contained in a geotechnical report is often referred to during the design period, the construction period, and frequently after the completion of a project as part of a claim. For underwriting purposes a geotechnical report is an extremely important report and provides information that can directly impact the success or failure of a construction project.



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Parts of a geotechnical report

Geotechnical reports generally are divided into two major sections; the first covering “site investigation information” generally common to all geotechnical reports for a type of geotechnical feature; and, the second covering basic information and recommendations that should be presented for specific geotechnical features such as retaining structures, structure foundations (e.g., spread footings, driven piles, drilled shafts, ground improvement techniques, etc.). Content and format vary by project size and applicable regulatory oversight; however, all geotechnical reports should include the following information:

- Summary of all subsurface exploration data, soil profiles, exploration logs, laboratory and on-site test results, and ground water information
- Interpretation and analysis of subsurface data
- Specific engineering recommendations for design
- Recommended construction techniques and special provisions
- Discussion of solutions for anticipated problems such as different foundation types

Guidelines for geotechnical reports may be federal (e.g., ACE, DOT), state, and/or local (e.g., Harris County Texas, City of Los Angeles, City of San Diego). Included may be USACE EM (Engineering Manual) 1110-1-1804, 1110-1-1802 and EM 1110-1-2908 requirements. Two of the most typical of the many related specifications involved with a geotechnical report include:

- ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes
- ASTM D-1586 Standard Test Method for Penetration Test and Split Barrel Sampling of Soils



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How reports are organized

Geotechnical report contents are often organized into the following formal sections:

- Letter of transmittal
- Site and project information
- Scope and limitations
- Discussion of project location general geology
- Summary of subsurface exploration data, soil profiles, exploration logs, laboratory and on-site test results, and ground water information
- Interpretation and analysis of the subsurface data
- Specific engineering recommendations for design
- Recommended construction techniques and special provisions
- Exploratory logs (e.g., boring logs) with boring log map and boring log test results
- Other associated reports may also attached

The geotechnical report text is the most informative section for underwriting purposes. It should include the general location of the investigation, the scope and purpose of the investigation in summary form, a concise description of the geologic setting and topography of the area, a discussion of field explorations and laboratory tests, and a general description of subsurface soil, rock, and groundwater conditions.

The plan and subsurface profile is the actual plan layout and subsurface profile of the site. Information presented includes site features, field exploration locations, graphic depictions of soil/rock, and groundwater levels. It may also note if the investigation meets minimum criteria for specific construction features such as foundations, retaining structures, or pavement.

Recommendations and conclusions are generally found in separate sections of the report and provide advice to contracting parties as to what types of foundations might be appropriate, how certain types of soil may be compacted, and other pertinent parameters.

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The field boring logs provide information related to soil densities, blow counts, groundwater elevations, moisture, soil classifications, and sample locations and support the conclusions and recommendations.

The laboratory test data provide results of tests used to determine soil characteristics and design criteria and typically include sieve analysis, moisture plots, direct shear tests, cone penetrometer, and compaction tests.



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