



GROUND TECHNOLOGY



Earthworks and Slopes:

Slope Stability Investigation, Analysis and Remedial Design

Our engineering teams have significant experience in the design, management and execution of slope stability assessments. We have undertaken numerous projects in a variety of environments on both natural and man made slopes including highway, motorway, rail and London Underground earthworks structures. This has gave us valuable experience in accessing restrictive working environments and using innovative techniques. By combining our construction knowledge with our site investigation, monitoring and engineering design capabilities, we are able to provide assistance throughout all stages of any slope stability assessment problem.

Our ground engineering specialists are able to assist with design and execute any of the following stages in the assessment of potentially unstable or failed slopes using in-house resources, knowledge and plant and equipment:

- Initial condition appraisal and geomorphological surveys
- Ground investigation design and implementation
- Geological profiling and soil sampling
- laboratory testing
- Instrumentation and monitoring of slope movements and groundwater conditions
- Stability assessment analysis and back analysis of failed slopes
- Reporting

In addition to assessing and investigating existing slopes, our specialist team can also provide advice for the design and construction of new infrastructure cuttings and embankments.

We approach slope investigation analysis by fully understand the slope condition, most likely or occurring failure mechanism and the critical soil and groundwater conditions in operation. We achieve this via a combination of detailed site observation, targeted investigation, high quality sample testing or short/long term monitoring followed by computer analysis. It is vitally important that appropriate soil strength parameters or soil/water conditions are obtained from the relevant location on the slope being investigated. Without high quality investigation, the stability analysis may lead to over design. We carry out stability analysis using a variety of methods including software packages. This enables us to rapidly and economically investigate a range of possible failure mechanisms and provide solutions to improve the slope stability with reference to the most critical conditions.



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We can provide a wide range of bespoke restricted access capabilities ensuring the ground investigation can and will determine the relevant properties to appropriate depths and in the correct locations. All of our investigations are designed to ensure that we are able to obtain the highest quality information as economically as possible, which will result in the most economic solution for any given slope.

Our wide ranging capability in the design of retaining, reconstructing, strengthening, improving and supporting of failed and marginally stable slopes, includes both hard and soft engineering solutions. We have knowledge and experience in the design and assessment of the following slope remedial solutions:

- Regrading
- Soil Nailing
- Retaining structures
- Reinforced earth slopes
- Drainage
- Lightweight and novel fills
- Grouting and mix in place stabilisation
- Surface protection including vegetation and membranes
- Stabilisation (lime, cement)

Earthworks

Construction schemes on sloping or uneven ground often require 'cut and fill' earthworks operations to provide stable and level formations across the site. We can offer clients our considerable expertise in earthworks advice and assistance, including the design and specification for a variety of earthworks operations. Our engineering specialists have the experience and knowledge to determine soil compaction parameters, specify appropriate fill materials, optimise earthworks design, oversee compaction operations and undertake performance monitoring, quality control supervision, design cut and fill slopes and analyse settlement characteristics. We can design and conduct soil mixing trials for the improvement of poor fill materials using lime and cement.

Using our expertise, we are able to minimise costs of your project by reducing the import and export volumes of materials from site. Our construction and engineering knowledge enables us to develop innovative and cost effective solutions to maximise the re-use of materials on site.