

# Geotechnical Services



## Areas of Expertise

- Site Investigation and Characterization
  - Soil Boring Programs
  - Rock Coring
  - Cone Penetrometer Testing Programs
- In-house Geotechnical Laboratory
  - Soil Strength and Characterization Testing
  - Rock Mechanics Testing
  - Dynamic Property Testing
- Construction Phase Services
  - Resident Engineering Services
  - Compaction Testing (Nuclear Gauge and Other Methods)
  - Foundation Inspections (Footings and Bearing Surface Verification, Drilled Shafts, Pavement Subgrade Inspections)
  - Dynamic Pile Testing and Analysis
- Slope Stability Analysis – Including Forensic Evaluations of Slope Failures
- Landfill Geotechnics
  - Liner and Cover Stability and Settlement Analysis
  - Leachate Collection and Management
- Transportation Geotechnics
  - Design-Build Projects
  - Bridge Foundation Design
  - Pavement Subgrade Analysis
  - Embankment Stability
- Foundation Design (Shallow and Deep Foundations)
- Earth Retention Design
  - Temporary Excavation/Bracing Design
  - Gravity Retaining Walls
  - Mechanically Stabilized Earth Walls
  - Anchored Wall Systems
  - Secant and Tangent Pile Walls
  - Soil Nailing
  - Marine Bulkhead Design
- Ground Improvement and Stabilization/Construction Over Soft Ground
  - Jet Grouting and Deep Soil Mixing
  - Staged Construction
  - Wick Drains
- Dam and Reservoir Engineering
- Finite Element Seepage and Stress Analysis
- Stability Analysis
  - Spillway and Energy Dissipation Structure Design
  - Instrumentation/Data Acquisition Systems (Inclinometers, Piezometers, Settlement and Displacement Monitoring)
- Seismic Hazards, Earthquake Engineering and Soil Dynamics
  - Liquefaction Evaluations
  - Site-Specific Seismic Hazard Analysis
  - Dynamic Response Analysis

## Overview

Geotechnical services are integral to a wide range of construction and industrial projects. Infrastructure safety is of utmost importance, and geotechnical services are fundamental to building bridges, highways, commercial and industrial buildings, power plants, refineries, water and wastewater treatment, hydropower, as well as high-rise buildings. For all these projects, seismic hazards must also be calculated. One misstep in geotechnical engineering can have devastating consequences to human health and the environment, as well as exposing businesses to serious financial risk, so it is critical to employ the most experienced geotechnical team.

## Our Approach

AECOM's geotechnical specialty practice supports a wide variety of infrastructure projects, including ash impoundments and landfills for power clients; municipal solid waste, construction/demolition debris landfills; heavy highway and bridge projects; water resources projects (dams, water treatment, conveyance facilities); and various size/use building facilities. AECOM delivers consistent quality and value with local resources, using our own staff and our network of proven geotechnical specialists.

We are able to investigate and develop solutions for a broad range of complex projects in a variety of geologic settings. We have a wide range of experience, from geotechnical engineering on large design-build transportation projects, to the design of major structures over soft ground conditions, to geotechnical engineering for marine structures and development. Our geotechnical teams critically analyze the characteristics of a site and perform in-house testing to assess risks and identify and evaluate applicable solutions to enable construction.



As a full-service design and engineering company, we employ hundreds of civil, structural/hydraulic engineers, environmental scientists/engineers and cultural resources personnel to supplement our team of geotechnical engineers. This provides our clients with cost-effective, constructible solutions that integrate multidisciplinary considerations into the final design.

## Key AECOM Capabilities

- We use innovative approaches and technologies, such as the use of ground improvement techniques, geosynthetic materials (geotextiles, geogrids, and geomembranes), and sustainable cover materials to increase bearing capacity and slope stability, and to reduce costs.
- We plan and implement beneficial re-use of materials such as coal ash, foundry sand, lime kiln dust, and wood chips for stabilization purposes.
- Our team implements a variety of investigative tools/techniques to streamline characterization (using ground monitoring instrumentation such as vibrating wire piezometers, settlement cells, and inclinometers).
- Where site restoration and reuse is the goal, AECOM maximizes the use of *in situ* technologies and integrates key site design elements with future site redevelopment plans. We apply innovative approaches to manage risks to an acceptable level so redevelopment or closure can be accomplished.
- Innovative site design elements have included:
  - Development of roadway infrastructure over closed municipal/industrial landfills
  - Restoration of natural streams following dam removals
  - Design of dewatering systems to allow clean closure of ash impoundments
  - Ground stabilization techniques such as wick drains, deep soil mixing or stone columns to stabilize slopes or allow site construction on soft, compressible soils

