CONCEPT

Geotechnical Risk Management and Operational Excellence Training Course



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Introduction:

Geotechnical Risk Management and Operational Excellence Training Course is a one-week course for project delivery managers, infrastructure risk specialists, geotechnical quality leads, and engineering oversight managers, culminating in a Geotechnical Risk Management and Operational Assurance Plan. Capital infrastructure projects routinely face severe operational disruptions, schedule slippage, and budget inflation when subsurface uncertainties, variable strata, and weak geotechnical verification protocols are mismanaged. Nominees already review site investigation reports, monitor earthworks packages, and coordinate ground engineering contractors, advancing their capabilities through structured case study analysis. CoreConcept Training Center delivers this course to embed rigorous operational control across geotechnical projects.

Course Objectives:

- Establish geotechnical risk registers and baseline operational parameters aligned with ISSMGE ground engineering guidelines
- Evaluate subsurface borehole investigations, sampling spacing limits, and laboratory soil testing data against ASTM test methods
- Assess complex ground hazards including collapsible soils, expansive clays, and soft saline deposits using ASTM testing criteria
- Audit finite element settlement models and slope stability simulations using PLAXIS 2D and GeoStudio verification workflows
- Structure quality assurance surveillance for earthworks compaction, dewatering schemes, and foundation load testing protocols
- Formulate the Geotechnical Risk Management and Operational Assurance Plan to govern capital project ground engineering risk

Target Audience:

- Capital project delivery managers responsible for managing civil infrastructure timelines, contractor delivery, and geotechnical risk exposure
- Geotechnical quality assurance leads responsible for auditing ground investigation scopes, borehole logging, and testing conformance
- Civil infrastructure risk specialists responsible for identifying subsurface soil hazards, quantifying ground uncertainties, and managing risk registers
- Engineering oversight managers responsible for reviewing foundation design submissions, approving shoring systems, and controlling site variations

Course Outline:

Day 1: Ground Uncertainty Landscape and Geotechnical Risk Governance

- ISSMGE Risk Assessment Framework Classifying Subsurface Geotechnical Uncertainties
- Geotechnical Baseline Report Architecture Defining Subsurface Ground Risk Allocation
- Site Exploration Depth Criteria Governing Foundation Width Penetration Depths
- Geotechnical Risk Register Formats Documenting Project Soil Hazards
- Capital Project Interface Protocols Aligning Ground Risk With Procurement

Day 2: Exploration Standards and Testing Quality Assurance

- ASTM D1586 Standard Penetration Test Protocols Verifying Field Execution
- ASTM D5778 Cone Penetration Testing Methods Evaluating Continuous Stratigraphy
- ASTM D4318 Atterberg Limits Standards Determining Soil Plasticity Indices
- ASTM D1557 Modified Proctor Compaction Controls Validating Fill Placement
- ASTM D1140 Soil Fines Passing Criteria Screening Subsurface Aggregates

Day 3: Problematic Strata and Operational Risk Mitigation

- ASTM D5333 Collapsible Soil Testing Metrics Evaluating Collapse Potential
- Expansive Clay Swelling Pressure Protocols Determining Ground Heave Mitigation
- Coastal Saline Soil Characterisation Frameworks Managing Sabkha Bearing Deficiencies
- GeoStudio SEEP/W Numerical Seepage Models Auditing Site Dewatering Controls
- Dynamic Foundation Vibration Criteria Evaluating Machine Foundation Base Interactions

Day 4: Numerical Assurance, Excavation Shoring, and Quality Surveillance

- PLAXIS 2D Finite Element Models Auditing Retaining Wall Deformation
- GeoStudio SLOPE/W Limit Equilibrium Methods Evaluating Embankment Stability Margins
- Deep Excavation Shoring Deflection Criteria Managing Adjacent Asset Settlement
- Geotechnical Interpretive Report Review Protocols Benchmarking Allowable Bearing Capacities
- Earthworks Compaction Quality Surveillance Tracking Subgrade Density Compliance

Day 5: Case Study Practice and Operational Plan Formulation

- Case Study Geotechnical Exploration Data Evaluating Borehole Spacing Sufficiency
- Case Study Problematic Strata Investigation Designing Targeted Ground Improvement
- Case Study Shoring Model Review Validating Excavation Wall Stability
- Case Study Dewatering Scheme Audit Verifying Groundwater Drawdown Controls
- Geotechnical Risk Management and Operational Assurance Plan Finalising Deliverable

Skills You Will Gain:

- Subsurface Geotechnical Risk Profiling
- Geotechnical Baseline Report Interpretation
- Field Borehole Exploration Quality Assurance
- Problematic Soil Hazard Assessment
- Finite Element Numerical Model Verification
- Ground Dewatering and Seepage Auditing
- Earthworks Compaction Quality Control

Why Attend This Course:

- Present the Geotechnical Risk Management and Operational Assurance Plan to the project steering committee to establish clear subsurface risk governance.
- Authorise geotechnical investigation scopes, borehole spacing matrices, and ground improvement strategies based on verified soil mechanics data.
- Prevent severe construction delays, foundation redesign expenses, and contractor claims arising from unforeseen ground conditions or problematic soils.
- Transfer standardized borehole audit checklists, numerical model review workflows, and dewatering control criteria to capital delivery teams.

Conclusion:

Following this course, the organisation implements the Geotechnical Risk Management and Operational Assurance Plan to standardise ground engineering governance. The project director and head of civil engineering utilize this deliverable to review subsoil exploration scopes, authorise foundation risk treatments, and audit contractor earthworks execution across major capital assets. Within six months of implementation, the project controls steering committee conducts a formal review of borehole verification logs, settlement risk registers, and dewatering monitoring data to validate ground risk reduction, enforce operational accountability, and prevent civil construction claims.

Frequently Asked Questions FAQ:

Which roles should an organisation nominate for the Geotechnical Risk Management and Operational Excellence Training Course?

Organisations should nominate capital project delivery managers, geotechnical quality assurance leads, civil infrastructure risk specialists, and engineering oversight managers. Nominees carry direct operational or managerial accountability for procuring site investigations, mitigating subsoil geotechnical risks, auditing earthworks quality, and controlling contractor performance across infrastructure and building assets.

What should nominees already do at work before attending the Geotechnical Risk Management and Operational Excellence Training Course?

Nominees should already review geotechnical site investigation logs, coordinate civil engineering contractors, or manage project risk registers. Practical experience in interpreting standard soil classification reports, overseeing earthworks operations, or approving foundation engineering submissions enables participants to engage effectively with ground risk quantification and numerical assurance methods.

What does the organisation receive when the participant returns from the Geotechnical Risk Management and Operational Excellence Training Course?

The organisation receives a Geotechnical Risk Management and Operational Assurance Plan. This practical management artefact establishes standardized ground investigation scope templates, problematic soil mitigation workflows, borehole audit protocols, and numerical model verification procedures to safeguard capital project delivery against costly subsurface delays.

Which standard or framework does the Geotechnical Risk Management and Operational Excellence Training Course follow?

The course follows International Society for Soil Mechanics and Geotechnical Engineering guidelines alongside ASTM international testing standards, including ASTM D1586 for penetration resistance, ASTM D4318 for Atterberg limits, ASTM D1557 for compaction control, ASTM D5333 for collapsible soils, and ASTM D5778 for cone penetration testing.