

Soil and Rock Slope Stability

“Excellent course. Rock slopes and reinforced earth design were very well explained.”

–Mathew Barendse, Geotechnical Engineer,
New York State Dept. of Transportation, Albany, NY

“The instructors were very knowledgeable about the subject and brought real-world experience to the seminar.”

–Jeffery S. Melton, Research Assistant Professor,
University of New Hampshire, Durham, NH

“This seminar presented useful and practical information. Information presented on stability analyses was particularly insightful and so were the tools provided to analyze slope stability.”

–Yogesh S. Rege, Geotechnical Engineer,
H.C. Nutting Company, Columbus, OH

“Excellent course tying field and analytical methods to practical slope stability applications.”

–Leo M. Coombs, Geotechnical Engineer,
Barrick Goldstrike, Carlin, NV

“It was immediately obvious that not only were the two instructors knowledgeable on each topic, but they were also experienced at real world applications. The analysis, tools and techniques that were provided will be very applicable in practice.”

–Alan Lisowy, Project Engineer,
Hepworth-Pawlak Geotechnical, Inc., Parker, CO

“I had not come across a continuing education course on the subject and was intrigued. I found the course very helpful with direct application to my area of highway engineering.”

–André Brackin, P.E., Design & Contracts and Stormwater Management - Engineer Supervisor, El Paso County Dept. of Transportation, Colorado Springs, CO

Purpose and Background

Landslides and slope failures are responsible for millions of dollars of damage to public and private property every year. The primary factors driving this trend include aging slopes constructed for major transportation systems in the U.S. during the 1950s and 1960s and the ever-increasing need to develop land on steep natural slopes and fills for public and private purposes. Because slopes consist of native or transported earth materials, engineering properties and behaviors are quite variable and unpredictable to precise limits. This variability is compounded by the frequent presence and influence of surface water runoff and groundwater infiltration that often trigger landslide movements. Today, the analysis and solution of landslide problems as well as the prevention of landslide problems requires an understanding of geology, hydrology, seismology, geotechnical exploration and engineering, computerized analytical methods, and practical and constructible engineering solutions.

The seminar will target three main areas of interest related to slopes:

- Collecting and evaluating geologic and geotechnical data
- Analytical methods for soil and rock slopes
- Stabilization methods

Slope stability analyses and stabilization require an understanding and evaluation of the processes that govern the behavior of slopes. Geology, hydrology, and seismology are the key subjects of interest. The fundamentals of these subjects must be understood as well as the methods for obtaining the data necessary for input to reliable slope stability analyses. Once this data is obtained and analyses carried out using methods ranging between rules of thumb and sophisticated computer methods, the results must be interpreted correctly and actions taken to stabilize the slopes if instability is suspected. This seminar will concentrate on the collection of input data and the subsequent analyses required to assess the stability of soil and rock slopes through the use of hands-on, computer based activities.

Seminar Benefits

- ❖ Exposure to the entire sequence of data acquisition, analysis, and solutions
- ❖ Review of analytical methods for soil and rock slope evaluation
- ❖ Hands-on training with computerized analytical methods and tools
- ❖ Training with state-of-the-art solutions that are both practical and constructible
- ❖ Up-to-date briefing on current data acquisition methods
- ❖ Experience-based information on design and construction

Who Should Attend?

This is a course for professionals who are seeking a more quantitative analysis of slope stability and relevant slope stabilization methods. Best suited for civil engineers, consultants, engineering geologists, soil scientists, city and public works officials, city planners, and other design professionals who address construction related slope stability and stabilization issues.

Seminar Instructors

SUNIL SHARMA, PH.D., P.E., Sunil Sharma is Professor of Civil Engineering at the University of Idaho, Moscow, Idaho, where he teaches Earthquake Engineering, Soil Dynamics, Seepage and Earth Dams, and other courses in Geotechnical Engineering. Dr. Sharma is the author of the popular slope stability computer program, XSTABL which is used by many highway agencies and consultants. His

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research interests and publications for the last 20 years have been focused on earthquake engineering, slope stability, foundation engineering, groundwater seepage, and computer software design and development.

STANLEY M. MILLER, PH.D., P.E., is Professor of Geological Engineering at the University of Idaho, where he teaches and conducts research in applied rock engineering, probabilistic methods in geotechnical engineering, slope stabilization, and geological engineering design. He has over 20 years of experience in geotechnical consulting, including projects for mining applications, reinforced soil structures, and slope stability investigations. He also has taught workshops on these topics over the last 15 years in the western U.S., in Canada, and in SE Asia (Malaysia and Singapore). His major interests are in rock slope stabilization, segmental retaining walls, risk analysis, and erosion control for steep slopes.

SUMMARY OUTLINE

Landslide Terminology

Soil Slope Data

Rock Slope Data

Infinite Slope Concepts

Method of Slices

XSTABL Tutorial

Soil Slope Analysis I

Rock Slope Analysis I

Rock Slope Analysis II

Seismic Analysis of Slopes

Stabilization Methods

Geotechnical Instrumentation

Case Histories



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