

## **GSI W-27 Webinar Entitled: “Stability Design of Landfill Cover Soils”**

### Webinar Overview

This webinar focuses on the stability design of relatively thin soil layers over geosynthetics as in typical landfill liners and covers. They are often called “vener” cover soils. It also applies to cover soils over liners of ponds and surface impoundments. After illustrating several failures (actually, cover soil slides) the geotechnical basis of design are presented. Obviously, direct shear testing of geosynthetics and soil are included in the necessary input values. They are described accordingly.

Computational details of a veneer cover soil’s stability are generated resulting in a quadratic equation solution. This solution to a standard example is presented. It is then numerically extended insofar as gravitational forces, construction equipment, seepage forces and seismic forces are concerned. Each decreases the FS-value of the standard example. Alternatively, the emphasis is then changed to actions which increase the FS-values of the standard example. They are toe (or buttress) berms, tapered cover soils, intentional reinforcement and nonintentional reinforcement. This set of nine discrete numeric examples is summarized and commented upon, and is followed with conclusions and recommendations.

### Learning Objectives

Participants will learn the analytic methodology of calculating FS-values for veneer soil stability as exemplified in landfill liner and cover soils. The process utilizes limit equilibrium techniques common to geotechnical engineering. Its adaptations to geosynthetic engineering will be seen to be straightforward. The ultimate objective is a safe and secure veneer cover soil system in landfill and related applications. The technique also appropriate in solving many transportation and infrastructure situations as well.

### Webinar Benefits

1. Appreciate the number and idiosyncrasies of veneer cover soil failures
2. Understand the analytic technique of limit equilibrium as applies to soils and geosynthetics for this application
3. Learn about situations which decrease cover soil stability
4. Learn about situations which increase cover soil stability
5. Understand the implications of defined and recommended FS-values

### Intended Audiences

Public and private owners/operators of landfills, heap leach mining operations, combustion coal residuals and related solid waste facilities; consultants and designers in the public and private sector; regulators and agency personnel at the federal, state and local levels; geosynthetic manufacturers and their representatives; geotechnical and geosynthetic testing organization personnel; contractors and installers of liner and cover systems; academic and research groups;

and others desiring technically related information on this important aspect of our constructed environment.

#### Specific Topics Covered

1. Introduction to Topic
2. Geotechnical Considerations
3. Destabilization of Veneer Slopes
4. Stabilization of Veneer Slopes
5. Summary of 9-Numeric Examples
6. Conclusions and Recommendations

#### Webinar Instructor

Dr. George R. Koerner is the current director of the Geosynthetic Institute, a position that he has held since 2014. George's interest in geosynthetics spans his entire professional life from undergraduate work in the 1980's to the present. He holds his PH.D. in Civil, Architectural and Environmental Engineering from Drexel University in Philadelphia. George's master thesis was on direct shear testing of geosynthetic interfaces and his doctoral dissertation was on landfill leachate clogging of soil and geosynthetic filters. Both are regularly cited to this day.

Dr. George Koerner is a Professional Engineer in both Pennsylvania and New Jersey, and is an ASQC Quality Auditor. During his 30-years of geosynthetic activities, Dr. Koerner's output has been tremendous and he has to his credit the following publications:

- Books Edited or Co-Edited – 15
- Journal Papers – 18
- Symposium and Conference Publications – 40
- Book Chapters and Published Reports – 4
- Miscellaneous Articles – 30

The Geosynthetic Institute is a nonprofit research and development organization dedicated to the proper use of geosynthetics in its myriad applications. As director of the Geosynthetic Institute, Dr. George Koerner is also in charge of the laboratory accreditation and inspection certification programs.