

**GSI W-22 Webinar Entitled:  
“Geosynthetic Reinforced MSE Walls; Overview, Failures and Items for Improvement”**

Webinar Overview

Mechanically stabilized earth (MSE) walls represent a grade separation structure which functions at a slope between unreinforced soil to classical (i.e., vertical) concrete walls. The soil mass itself is layered with geogrids or geotextiles such that a coherent stable mass is formed. The facing is usually either vegetated or masonry block, including many aesthetic variations. MSE walls have reached to 25 m in height, supported railroads and heavy surcharge loads, buildings of moderate bearing capacity and can readily function adjacent to water courses and seismic conditions. Furthermore, they are shown by a recent survey to be the least costly of any other type of retaining wall by 20 to 50%.

Design of such MSE walls is well within the state-of-the-practice and is usually addressed using a computer code. The six essential elements of design being the following; each of which are numerically addressed.

Internal Stability	External Stability
<ul style="list-style-type: none"><li>• tensile overstress (spacing)</li><li>• retained soil pullout (length)</li><li>• facing connection overstress</li></ul>	<ul style="list-style-type: none"><li>• mass sliding</li><li>• mass overturning</li><li>• bearing capacity</li></ul>

Unfortunately, there have been failures consisting of either excessive deformation or actual collapses. The presenter has been collecting such failures since 2000, and the worldwide database is over 300! They will be analyzed so as to learn where ongoing concerns exist. In this regard, five areas appear to be fundamental insofar as remedies are concerned. They will be described accordingly.

- use of fine grained backfill soils
- poor compaction of backfill soils
- inclusion of drainage facilities within in the backfill
- surface and adjacent water issues
- miscellaneous design details

Summarizing comments and conclusions will be offered accordingly.

Learning Objectives

Participants will learn about this new class of retaining walls (and steep slopes), cost comparison to other wall types, elements of design, and particularly where problems have existed in the past. These past problems have been classified into groups which give clear insight into the mechanisms involved. Five particular aspects of design and/or construction will be offered which, if followed, would minimize such failures from occurring in the future.

### Webinar Benefits

1. Understand the various aspects and zones of geosynthetic reinforced MSE walls
2. Gain insight into the various geosynthetic materials used for the reinforcement
3. Appreciate the inherent economy of MSE walls in comparison to all other wall types
4. Be exposed to the various statistical findings of the assembled database
5. Understand the five major items needed for improvement of this type of all system

### Intended Audiences

Owners of sites needing grade separation in both the public and private sectors; federal, state and regional geotechnical, transportation, and environmental engineers; engineers from municipal districts and townships; private and municipal land developers, architectural and landscape designers; general civil consulting engineers; hardscape designers; testing laboratories servicing these organizations; manufacturers and representatives of geosynthetic and masonry block materials; ground modification contractors; academic and research groups; and others desiring technically related information on this important aspect of our constructed infrastructure.

### Specific Topics Covered

1. Background, Aesthetic and Costs
2. Elements of Design
3. Cases of Inadequate Performance
4. Major Items for Improvement
5. Summary and Conclusions

### Webinar Instructor

Dr. Robert M. Koerner's (Professor Emeritus of Civil Engineering at Drexel University and Director Emeritus of the Geosynthetic Institute) interest in geosynthetics spans over forty years of teaching, research, writing and advising. He holds his Ph.D. in Geotechnical Engineering from Duke University. He is a registered Professional Engineer in Pennsylvania, a Distinguished Member of ASCE, a Diplomate of the GeoInstitute and a member of the National Academy of Engineering. Bob has authored and co-authored about 750 papers on geosynthetics and geotechnical topics in journals and at national and international conferences. His most widely used publication is the sixth edition of the textbook entitled "*Designing with Geosynthetics*". He is the founding director of the Geosynthetic Institute which is a nonprofit research and development organization dedicated to the proper use of geosynthetics in its myriad applications. The institute also provides laboratory accreditation and inspection certification programs.