

Student GeoChallenge GeoWall Competition

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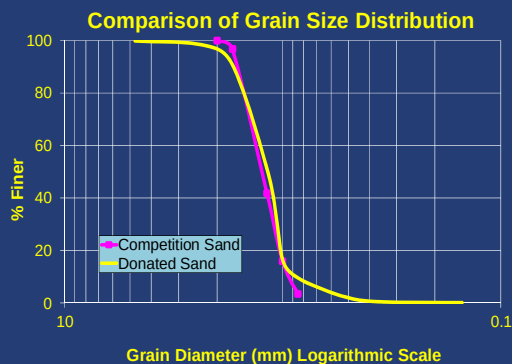
Project Objectives

- Design, Build, and Test Mechanically Stabilized Earth (MSE) Wall to withstand the specified loading cases:
 - Self Weight
 - Vertical Load
 - Lateral Load
- Satisfy deflection limits
- Use minimal reinforcement
- Account for proximity of boundary walls



Competition Criteria

- Specified construction materials and tools
- Construction tolerances
- Load capacity (vertical and lateral)
- Failure modes
 - Sand leakage
 - Deflection of wall facing
 - Collapse of wall facing
- Design Methodology of strip layout and spacing
- Design based, rather than trial and error



Material Properties

Unit Weight of Sand	104.8 lb/ft ³
Tensile Strength of Strips	29.0 lb/in
Sand Friction Angle	28.0°
Friction Angle between Sand & Reinforcement	24.0°

Design Methods

- Federal Highway Administration (FHWA) Method (Publication No. FHWA-NHI-00-043)
 - Eliminate reinforcement pull out
 - Eliminate reinforcement breakage
 - Boundary condition correction necessary
- P-Y Method for lateral pile loading
- Construction phase requires adhering to strict time limits

Construction of Final Design



Competition

- Competed at the national Conference, Oakland, CA (March 2012)
- Final reinforcement weight = 5.9 g

