

Designer Note: If your project's soils report requires geotechnical reinforcement, check with the Geotechnical Engineer prior to using this provision. There is also a CADD drawing "Geotechnical Reinforcement for Side Slopes" which is to be used with this provision and the Geotechnical Engineer will need to furnish additional data to complete that drawing. Assure treatment areas are shown on both the plans and cross sections. 7-1-94 Revised D.S.P. for Section and metrics.

## GEOTECHNICAL REINFORCEMENT

Effective June 10, 1993      Revised January 1, 2007

This work shall consist of furnishing and installing a geogrid reinforcement system in the manner depicted in the bid documents and the applicable portions of Section 3.5 - Geogrid Soil Reinforcement - of the FHWA "Interim Guidelines for Design, Specifications, & Contracting of Geogrid Mechanically Stabilized Earth Slopes on Firm Foundation" dated December 1991.

The geogrid shall develop an allowable design force ( $T_a$ ) in the roll direction of 2000 lb/ft. (29,000 N/m) width of grid based on the following allowable stress:

$$T_a = \frac{T_{ult}}{FS_{cr} \times FS_{id} \times FS_{cd} \times FS_{bd} \times FS_{jnt}}$$

Where:

$T_a$  = allowable strength, plf (Nm), for use in stability analyses.

$T_{ult}$  = ultimate strength, plf (Nm), which is an index value used for quality control (QC) purposes

$FS_{cr}$  = partial factor of creep deformation, ratio of QC strength to creep limiting strength.

$FS_{id}$  = partial factor of safety for installation damage.

$FS_{cd}$  = partial factor of safety for chemical degradation.

$FS_{bd}$  = partial factor of safety for biological degradation, used in environments where biological degradation may exist.

$FS_{jnr}$  = partial factor of safety for joints (seams and connections).

Total creep strain of the reinforcement shall be less than 10% over the design life of 75 years, for reinforced slopes.

In no case shall an installation damage factor ( $FS_{id}$ ) less than 1.05 be used.

In no case shall a chemical durability factor ( $FS_{cd}$ ) less than 1.1 be used, per Task Force 27 recommendations.

The geotechnical reinforcement rolls do not have to be connected or fastened to the ground other than to assure the grid stays in place during placement of the fill material.

Equipment will not be allowed directly on the geotechnical reinforcement. The first lift of embankment shall be placed on the geotechnical reinforcement without equipment tracking over it. Discing of the first lift of embankment will not be required.

The Contractor shall compact the embankment as specified in Section 205 of the Standard Specifications. Care shall be taken during compaction to prevent damage to the geotechnical reinforcement. Any damage shall be repaired immediately prior to continuing with the embankment. Costs for repair or geogrid replacement are the responsibility of the Contractor.

Before shipment of geogrid to the site for storage or use, the Contractor shall submit for approval the 10,000 hour creep test data, pullout test data, calculations and product literature showing compliance with the Special Provision. The data shall be submitted and sealed by an engineer licensed in Illinois.

Wide width tensile testing in accord with ASTM D4595 shall be submitted from the specific lot of material shipped to the project. Field samples may be taken by the Project Engineer to verify ASTM D4595 results.

This work will be measured in place and the area computed in Square Yards (Square Meters). The work will be paid for at the contract unit price per Square Yard (Square Meter) for GEOTECHNICAL REINFORCEMENT.