

## Index 501 Geosynthetic Reinforced Soils

### Design Criteria

*PPM*, Vol. 1, Chapter 31; *Soils and Foundations Handbook*, Chapter 8; *Structures Design Guidelines (SDG)*

### Design Assumptions and Limitations

For Geosynthetic Reinforced Soil (GRS) walls and bridge abutments (application usages R-1), refer to *SDG* 3.12.12 and *SDG* 3.13.4, and Chapter 8 of the *Soils and Foundations Handbook*.

For reinforced foundation over soft soils and reinforced slopes applications (application usages R-2 & R-3), refer to *PPM*, Vol. 1, Chapter 31.

For reinforced embankment and construction expedient applications (application usages R4 & R5), refer to Chapter 8 of the *Soils and Foundations Handbook*.

### Plan Content Requirements

Provide the geosynthetic application type and any specific requirements to ensure the geosynthetic selected from the *Approved Products List (APL)* will be suitable. Refer to the 2015 Supplemental *Specifications* Section 985 to determine which test values will be available for selecting the products for each application from the *APL*.

Additional Plans content requirements are as follows:

Control drawings are required which depict the geometrics (plan and elevation view) of the area being reinforced. These designs are generic and are not based upon any one specific product or supplier; the product brand names are not shown on the plans. For GRS walls and GRS bridge abutments, refer to *SDG* 3.13.4 for Plans content requirements. For reinforced slopes the designer shall design the slopes using the maximum reinforcement spacings allowed. For soft soils the designer shall design the reinforcement and provide the minimum total strength required.

The plans shall depict the required reinforcement strength based on the maximum allowed spacing of these materials, the extent and the number of layers of geosynthetic reinforcement, vertical spacing of geosynthetic reinforcement, orientation of geosynthetic facing details, details at special structures or obstructions, typical construction sequence, and top and bottom elevations of the geosynthetic reinforcement layers. Surface treatments and any other required design parameters or limitations shall also be shown in the plans.

When specifying Reinforcement Grid (Pay Item 145-71), for reinforced embankment and construction expedient applications a geogrid strength and the application usage must be provided to assist the contractor in selecting an applicable product. Provide the required geogrid strength as follows:

- For reinforced embankment applications include the required  $T_a$  values for both layers (as determined using the equation in Note 2 on Sheet 1) for the geosynthetic material.
- For construction expedient usage, provide the required strength of the geosynthetic at either 2% strain or 5% strain, whichever is most appropriate for the project.

## Payment

Item number	Item description	Unit Measure
549-1	GRS Retaining Wall	SF
549-2	GRS Bridge Abutment	SF
145-1	Geosynthetic Reinforced Soil Slope	SF
145-2	Geosynthetic Reinforced Foundation Over Soft Soil	SY
145-71	Reinforcement Grid, Biaxial	SY