

SECTION 13800

GEOGRID

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish all Geogrid, including all necessary and incidental items as detailed or required for the Contractor to complete Geogrid installation in accordance with the Drawings and these Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Related Contract Work is described in the following sections of the Specifications:

- A. Section 02200 – Earthwork
- B. Section 13100 – Mechanically Stabilized Earth Retaining Wall

1.03 SUBMITTALS

- A. Prior to shipping to the site, the Geogrid Manufacturer shall submit to the Design-Builder two copies of a mill certificate or affidavit signed by a legally authorized official of the Geogrid Manufacturer for each type of Geogrid. The Geogrid Manufacturer shall also submit three Geogrid samples, 1 square yard each, with the mill certificate for the Geogrid. The mill certificate or affidavit shall attest that the Geogrid meets the chemical, physical and manufacturing requirements stated in the specifications. The samples shall be labeled with the manufacturer's roll direction, date of sampling, project number, manufacturer and product name.
- B. The Geogrid Manufacturer shall provide connection details for joining new and existing Geogrid, where applicable. Calculations and drawings required to demonstrate conformance with joint requirements shall be provided. For mechanical connections (Bodkin bars, etc.), the Geogrid Manufacturer shall provide a minimum of two Geogrid joint samples to the Contractor.
- C. The Contractor shall provide a panel layout plan showing the location of all Geogrid panels, overlaps and connections, at least six weeks prior to installation. Where Geogrid is used in conjunction with Mechanically Stabilized Earth (MSE) retaining walls, the layout plan shall be provided as described for submittals in Section 13100 of these Specifications.
- D. The Design/Builder shall be furnished copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into construction.

PART 2 -- MATERIALS

2.01 MATERIALS

- A. Geogrid shall be defined as a geosynthetic used for reinforcement and is formed by a regular network of tensile elements with apertures of sufficient size to allow penetration and interlocking with surrounding soils.
- B. The Geogrid shall be manufactured from polyethylene or high tenacity polyester with PVC coating in a manner approved by the Design-Builder and the Owner. The largest Geogrid roll width allowed shall be 25 feet.
- C. Geogrid properties shall conform to the minimum properties shown on Table 1 – Minimum Required Geogrid Properties, located in Section 13800 of these Specifications. The Contractor shall be responsible for timely submittals of all confirmation test data for Geogrid at the time of bid submittal.

PART 3 -- EXECUTION

3.01 SHIPPING, HANDLING AND STORAGE

- A. During periods of shipment and storage, all Geogrid shall be protected from direct sunlight, temperature greater than 140°F. water, mud, dirt, dust, and debris. To the extent possible, the Geogrid shall be maintained wrapped in heavy-duty protective covering, if provided by the manufacturer, until use.
- B. The Owner shall approve the shipping and delivery schedule prior to shipment. The Owner shall designate the on-site storage area for the Geogrid. Unloading and storage of Geogrid shall be the responsibility of the Contractor.
- C. Geogrid that is damaged during shipping or storage shall be rejected and replaced at Contractor expense.

3.02 QUALITY ASSURANCE CONFORMANCE TESTING

- A. At the discretion of the Design-Builder, representative samples of Geogrid may be obtained and tested by the Design-Builder to assure that the material properties conform with these Specifications. Conformance testing shall be conducted by the Design-Builder and paid for by the Owner.
- B. The Contractor shall not install any Geogrid until related Conformance Testing is completed and test data indicate conformance with these Specifications. The Contractor shall allow a two week period after each Geogrid delivery for Conformance Testing to be completed. The Design-Builder will review delivery tickets for each load of Geogrid to determine the need for Conformance Testing.
- C. Geogrid that is rejected shall be removed from the project site and replaced at Contractor's cost. Sampling and conformance testing of Geogrid supplied as replacement for rejected material shall be performed by the Design-Builder at Contractor's cost.

3.03 SUBGRADE PREPARATION

- A. The exposed subgrade shall be proofrolled using a loaded dump truck in the presence of the Design-Builder or his representative. Any areas where proofrolling indicates soft, loose or otherwise unsuitable subgrade shall be excavated and replaced with Compacted Embankment or MSE Wall Backfill in accordance with Section 02200 of these Specifications.
- B. If proofrolling of the subgrade has been completed in conjunction with placement of Compacted Embankment below the Geogrid (see Section 02200 of these Specifications), then proofrolling will not have to be repeated prior to Geogrid placement.
- C. Geogrid subgrade shall be maintained at the lines and grades shown on the Drawings. Any structural fill placed to provide Geogrid subgrade or to replace unsuitable excavated material shall conform to the requirements of Section 02200 – Embankment of these Specifications.
- D. The Contractor shall provide all labor and materials necessary to protect the subgrade surface from erosion. No Geogrid shall be installed until the subgrade has been inspected and approved by the Design-Builder.

3.04 INSTALLATION

- A. Geogrid shall be placed to the lines and grades shown on the Drawings. At the time of installation, the Geogrid shall be rejected by the Design-Builder if it has defects, tears or other damage.
- B. Geogrid installation, including subgrade preparation, Geogrid placement, overlap at edges and attachment to existing Geogrid shall be in accordance with the Drawings and these Specifications.
- C. Any Geogrid panel that is damaged during installation shall be repaired or replaced as directed by the Design-Builder.
- D. Where two orthogonal layers of Geogrid are indicated on the Drawings, the initial Geogrid layer shall be placed in a direction perpendicular to the axis of the slope. The overlying layer shall be placed in a direction perpendicular to the initial Geogrid layer.
- E. Geogrid shall only be placed over subgrade that is at the proper density, has a relatively smooth surface, is free from standing water and approved by the Design-Builder. Geogrid shall be nominally pretensioned during installation using temporary stakes, pins or other approved methods. Geogrid shall be installed to maintain contact with the subgrade surface.
- F. Adjacent Geogrid panels shall be overlapped a minimum of 6 inches and connected using white nylon or polyethylene cable ties at 3-foot spacing. In the cross roll (cross machine) direction, where approved in advance by the Design-Builder, adjacent panels shall be overlapped a minimum of 2 feet and connected in such a fashion that the full required tensile strength of the Geogrid is transferred across the joint.

- G. Where Geogrid is used in construction of MSE retaining walls, overlap requirements for overlap of adjacent panels may be waived by the Design-Builder.
- H. The exposed Geogrid surface shall be off limits to construction vehicles. Overlying backfill shall be backdumped and spread in a manner that minimizes development of folds or wrinkles or otherwise damages the geosynthetic reinforcement. A minimum of 12 inches of overlying fill shall be in place prior to operation of construction equipment.

3.05 CONNECTION TO EXISTING GEOGRID (NOT USED)

TABLE 1 – MINIMUM REQUIRED GEOGRID PROPERTIES

<u>Geogrid Property</u>	<u>Minimum Value</u>
Base Polymer	High Tenacity Polyester or Polyethylene
Construction	Woven, Knitted or Extruded
Aperture Size (In.)	0.5
Wide Width Tensile Strength* (lb/ft) at Break ASTM D4595	4,500
Long Term Allowable Design Load* (LTADL)(lb/ft) GRI GG-4a for Polyethylene Geogrid or GRI GG-4b for Flexible Geogrid	1,400

* Tensile Property in Roll Direction

- END OF SECTION -