

**Item No. 607S**  
**Slope Stabilization Applications**  
**For Erosion Control**

**607S.1 Description**

This item shall govern the construction of slope stabilization devices, where plant growth cannot be readily established or sustained without slope stabilization measures, in conformance with this Specification Item and in accordance with locations, lines and grades indicated on the Drawings or as directed by the Engineer or designated representative.

This Standard Specification Item shall apply to erosion control measures only and shall not apply to structural stabilization of slopes.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text, inch-pound units are given preference with SI units shown within parentheses.

**607S.2 Submittals**

The submittal requirements for this specification item shall include the soil retention blanket material type and sample, evidence that the material is listed on the current version of TxDoT/TTI's Approved Products List, one (1) full set of manufacturer's literature and installation recommendations, and any necessary special details.

**607S.3 Materials**

**A. Precast Concrete Units.**

Concrete units shall be precast concrete blocks with a 12 to 16 inch (300 to 400 mm) module and shall be 4 or 6 inches (100 or 150 mm) thick, as indicated on the Drawings. The concrete shall attain a minimum 28-day compressive strength of 4000 psi (27.5 megaPascals) in conformance to Class S of Standard Specification Item No. 403, "Concrete for Structures". Each precast concrete unit will weigh at least 30 pounds per cubic foot (480 kilograms per cubic meter) and the open void area will range from 20 to 25 percent.

The Filter/carrier fabric shall conform to Item No. 620S, "Filter Fabric". The fabric shall be of sufficient strength to support not less than 1 1/2 times the weight (mass) of the mat when slung by lifting at both ends.

**B. GeoGrid**

GeoGrid shall consist of polypropylene base and shall be: 1) resistant to all natural occurring alkaline and acidic soil conditions, 2) resistant to attack by bacteria and fungi, and 3) ultraviolet stable. The plastic grid shall have a thermal stability range from -60° F to 175° F (-50°C to 80°C) and a Melt Index of 0.2 grams/10 minutes.

Geogrid shall have a density between 75 to 106 pounds per cubic feet (1.2 to 1.7 megagrams per cubic meter) and thickness shall be 0.15 to 0.25 inch (4 to 6 mm).

Tensile strength shall be 860 to 1230 pounds per square foot (41 to 59 mPa) across the roll.

**C. Earth Reinforcement System**

A patented earth reinforcement system shall consist of interlocking precast reinforced concrete units of the size, shape and texture indicated on the Drawings, placed on a concrete foundation. All precast concrete shall be Class S, with a minimum 28 day compressive strength of 4000 psi (27.5 mPa), cast-in-place concrete shall be Class A, conforming to Item No. 403, "Concrete for Structures". All joints shall be caulked and protected with a filter fabric as indicated on the Drawings. All reinforcing steel shall conform to Item No. 406, "Reinforcing Steel". All tie back and reinforcing mesh shall be in accordance with manufacturer's recommendations.

Filter fabric to conform to Item No. 620S, "Filter Fabric.

**D. Gabions and Revet Mattresses.**

Gabions shall be assembled and placed as directed on the Drawings in accordance with Standard Specification Item No. 594S, " Gabions and Revet Mattresses".

**E. Additional Materials and Methods**

In addition to those systems described above, the following items may be used in combinations or separately, as indicated on the Drawings:

Standard Specification Subject	Item No
Concrete for Structures	403S
Concrete Structures	410
Riprap for Slope Protection	591S
Concrete Retards	593S
Sodding for Slope Stabilization	602S
Seeding for Slope Stabilization	604S
Salvaging and Placing Topsoil	601S
Soil Retention Blanket	605S
Filter Fabric	620S
Dry Stack Wall (DS)	623S
Rock Berm (RB)	639S
Mortared Rock Wall (RW)	640S

Additional Products not mentioned herein may be indicated on the Drawings.

**607S.4 Construction Methods**

**A. Precast Concrete Units**

**1. Subgrade Preparation.**

The slope on which the units are to be placed shall be constructed according to lines and grades indicated on the Drawings. Fill materials shall be placed in lifts, which do not exceed 8 inch (200 mm) loose measure, and compacted to a minimum of 95 percent of maximum dry density as determined in accordance with

TxDOT Test Method Tex-114-E or as approved by the Engineer or designated representative.

2. Placing the Units.

The precast concrete units shall be placed on a concrete foundation in accordance with the manufacturer's recommendations. Filter fabric will be required.

3. Backfill.

Backfill shall consist of fine granular material or topsoil as indicated on the Drawings or as approved by the Engineer or designated representative. Seeding or sodding, when required, shall be placed directly over topsoil and shall conform to Item No. 604S, "Seeding for Erosion Control" and Item No. 602S, "Sodding for Erosion Control".

B. GeoGrid

1. Subgrade Preparation.

The compacted slope on which the plastic grids are to be placed shall be constructed according to the lines and grades indicated on the Drawings. Prior to placement the grid, pieces of wood, rock, concrete, brick or other objects that might damage the plastic grid shall be removed.

2. Placement of the Geo Grid.

The grid shall be placed directly on the ground surface. Adjacent and adjoining rolls shall be overlapped and tied in accordance with manufacturer's recommendations by a minimum of 1 and 6 feet (0.3 to 1.8 meters) respectively. The grid shall be installed and anchored in accordance with manufacturer's recommendations and details indicated on the Drawings.

Any damage to the fabric as a result of Contractor's vehicles, equipment or operations shall be repaired at Contractor's own expense.

The amount of grid placed shall be limited to that which can be covered with backfill within the succeeding 72 hours.

3. Backfill.

A minimum thickness of 4 inches (100 mm) of fine granular material shall be placed directly over the plastic grid and compacted to a minimum of 95 percent of the maximum dry density as determined in accordance with TxDOT Test Method Tex-114-E. Seeding or sodding shall be placed on areas backfilled as indicated on the Drawings and shall conform to Item No. 604S, "Seeding for Erosion Control" or Item No. 602S, "Sodding for Erosion Control".

C. Earth Reinforcement System

1. Excavation.

Excavation shall conform to applicable requirements of Standard Specification Item No. 111S, "Excavation" and Standard Specification Item No. 401, "Structural Excavation and Backfill" in accordance with limits and construction stages indicated on the Drawings. Any foundation soils found to be unsuitable shall be removed and replaced with acceptable backfill material.

2. Foundation.

The foundation subbase for the structure, approved by the Engineer or designated representative, shall be graded and then compacted to 95 percent of the maximum dry density as determined in accordance with TxDOT Test Method Tex-114-E. The leveling pad shall be constructed of Class A concrete conforming to Standard Specification Item No. 403S, "Concrete for Structures", along the lines and grades indicated on the Drawings.

3. Wall Erection.

The wall modules, joint filler and leveling pads shall be placed as indicated on the Drawings in accordance with the manufacturer's recommendations. Special care shall be taken in setting the bottom course of units to true line and grade.

All modular units above the first course level shall interlock with lower courses. Vertical joints shall be staggered with each successive course. The vertical joints on the front face of the wall shall not exceed 3/4 inch (19 mm) tolerance. Joint filler shall be installed in all joints and filter fabric shall be installed behind the wall as indicated on the Drawings. The overall vertical tolerance of wall plumbness (from top to bottom) shall not exceed 1/2 inch per 10 feet (4 mm per meter) from the dimensions indicated on the Drawings.

4. Drainage. Drainage shall conform to Standard Specification Item No. 551, "Pipe Underdrains" and to the details indicated on the Drawings.

5. Backfill.

The placement of the backfill shall follow closely behind the erection of each lift of panels. The maximum lift thickness shall not exceed 8 inches (200 mm), loose measure. At each reinforcing mesh level, the backfill shall be roughly leveled before placing and attaching mesh. Reinforcing mesh or straps shall be placed normal to the face of the wall.

Backfill compaction shall be accomplished without disturbance or distortion of reinforcing mesh, filter fabric and face panels. All backfill shall be compacted to 95 percent maximum dry density as determined in accordance with TxDOT Test Method Tex-114-E. The Contractor shall decrease the lift thickness, if necessary, to obtain the specified density. During backfill compaction the moisture content may not exceed a value 2 percent greater than maximum dry density (i.e. optimum as determined by TxDOT Test Method Tex-114-E).

Compaction of the backfill shall not be accomplished by sheep foot, grid rollers or any other type of equipment employing a foot, which in the opinion of the Engineer or designated representative could damage the reinforcing mesh. At the end of each day's operation, the Contractor shall shape the backfill to drain away from the face of the wall.

All backfill material used adjacent to the structure shall be crushed stone, that is free from organic or otherwise deleterious materials, and the grading of the backfill material established in accordance with TxDOT Test Method Tex-110-E shall conform to the following gradation limits.

Sieve Size		Percent Passing
US	SI	

6 inches	150 mm	100
3 inches	75 mm	75 -100
No. 200	75µm	0-15

**607S.5 Measurement**

Work and accepted material for "Slope Stabilization" will be measured by the square yard (square meter: 1 square meter is equal to 1.196 square yards), complete in place from the top of the foundation to the top of the slope stabilization erosion control. Foundations will not be measured for payment.

**607S.6 Payment**

Work performed and materials furnished as prescribed by this Specification Item and measured under "Measurement" will be paid for at unit bid price per square yard for "Slope Stabilization for Erosion Control". The unit bid price shall include full compensation for: a) all excavation, foundation installation, subgrade preparation, placement of filter fabric, underdrains, precast blocks and tie backs, and b) all labor, tools, equipment and incidentals necessary to complete the backfilling operations.

Payment will be made under:

<b>Pay Item No. 607S-A:</b>	Precast Concrete Unit	Per Square Yard.
<b>Pay Item No. 607S-B:</b>	GeoGrid, _____	Per Square Yard.
<b>Pay Item No. 607S-C:</b>	Earth Reinforcement System	Per Square Yard.

**End**

<b><i>SPECIFIC</i> CROSS REFERENCE MATERIALS</b>
Specification 607S, "Slope Stabilization Applications For Erosion Control"

City of Austin Standard Specification Items

<u>Designation</u>	<u>Description</u>
Item No. 111S	Excavation
Item No. 401	Structural Excavation and Backfill
Item No. 403S	Concrete for Structures
Item No. 406	Reinforcing Steel
Item No. 410	Concrete Structures
Item No. 551	Pipe Underdrains
Item No. 591S	Riprap for Slope Protection
Item No. 593S	Concrete Retards
Item No. 594S	Gabions and Revet Mattresses
Item No. 601S	Salvaging and Placing Topsoil
Item No. 602S	Sodding for Erosion Control

<b><i>SPECIFIC</i> CROSS REFERENCE MATERIALS - Continued</b>
Specification 607S, "Slope Stabilization Applications For Erosion Control"

City of Austin Standard Specification Items

<u>Designation</u>	<u>Description</u>
Item No. 604S	Seeding for Erosion Control
Item No. 605S	Soil Retention Blanket
Item No. 620S	Filter Fabric
Item No. 623S	Dry Stack Wall (DS)
Item No. 639S	Rock Berm (RB)
Item No. 640S	Mortared Rock Wall (RW)

Texas Department of Transportation: Manual of Testing Procedures

<u>Designation</u>	<u>Description</u>
Item No. 110-E	Surveying and Sampling Soils for Highways
Item No. 114-E	Laboratory Compaction Characteristics & Moisture-Density Relationship of Subgrade & Embankment Soil

TxDOT/TTI Hydraulics and Erosion Control Laboratory

<u>Designation</u>	<u>Description</u>
Annual Report	Approved Products List

***RELATED CROSS REFERENCE MATERIALS***

Specification 607S, "Slope Stabilization Applications For Erosion Control"

City of Austin Standard Specification Items

<u>Designation</u>	<u>Description</u>
Item No. 101S	Preparing Right of Way
Item No. 102S	Clearing and Grubbing
Item No. 120S	Channel Excavation
Item No. 132S	Embankment
Item No. 606S	Fertilizer
Item No. 608S	Planting
Item No. 610S	Preservation of Trees and Other Vegetation

Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges

<u>Designation</u>	<u>Description</u>
Item No. 100	Preparing Right of Way
Item No. 110	Excavation
Item No. 132	Embankment
Item No. 158	Specialized Excavation Work
Item No. 160	Furnishing and Placing Topsoil
Item No. 162	Sodding for Erosion Control
Item No. 164	Seeding for Erosion Control
Item No. 166	Fertilizer
Item No. 168	Vegetative Watering
Item No. 169	Soil Retention Blanket
Item No. 204	Sprinkling