

**Section 32 12 43**  
**(1997 Section 02795)**

**PERMEABLE, FLEXIBLE and PLANTABLE CONCRETE EROSION CONTROL SYSTEM**

**PART 1: GENERAL**

**1.01 Description**

- A. Work shall consist of furnishing all material, labor, services and related items to complete the installation of Drivable Grass® a permeable, plantable and flexible concrete erosion control system in accordance with these specifications.

**1.02 Related Sections**

- A. Section 31 10 00 - Site Clearing
- B. Section 31 20 00 - Earth moving
- C. Section 32 14 00 - Unit Pavers
- D. Section 32 80 00 - Irrigation
- E. Section 32 91 13 - Soil Preparation
- F. Section 32 92 00 - Turf and Grass
- G. Section 32 92 19 - Seeding
- H. Section 03 30 00 - Cast in place concrete

**1.03 Reference Documents**

- A. ASTM D-422 - Particle Size Analysis
- B. ASTM D-698 - Laboratory Compaction Characteristics of Soil - Standard Proctor
- C. ASTM D-1557 - Laboratory Compaction Characteristics of Soil – Modified Proctor
- D. ASTM C-33 - Standard Specification for Concrete Aggregates
- E. ASTM C 150 - Standard Specification for Portland Cement

**1.04 Submittals/Certification**

- A. Procedures: Comply with Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples:
  - a. Submit 8" x 8" Drivable Grass® concrete erosion control mat sample
  - b. Submit Geotextile or Rolled Erosion Control Blanket Underlayment data
  - c. Submit sieve analysis for grading of bedding sand and base material (if required)
  - d. Verify source of compost material for bedding and seed cover (if required)
  - e. Verify grass seed and/or hydro-seed/mulch mix and sources
  - f. Submit hydraulic testing report for the product that is representative of its intended use

**1.05 Quality Assurance**

- A. Installer Qualifications: An experienced installer who has successfully completed installations of erosion control / revetment or other concrete systems on projects of similar or larger scope and magnitude.
- B. Prior to commencing the work of this section, verify the accuracy of layout and grading. Verify that all sub-grades and base course aggregate conditions (if required) are as specified. Notify the owner and / or engineer of any discrepancies and coordinate the correction of those discrepancies with other trades as necessary.

**1.06 Delivery, Storage and Handling**

- A. Deliver materials to site in manufacturer's original palletized configuration with labels clearly identifying product style number, color, name and manufacturer.
- B. Check all materials upon delivery to assure that the proper type, grade, color, and certification have been received.

- C. Store materials in clean, dry area in accordance with manufacturer's instructions.
- D. Protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

**1.07 Project Conditions**

- A. Review installation procedures and coordinate Drivable Grass® concrete erosion control system installation with other work around installation area.
- B. All adjacent perimeter edging, or other hardscape/paving surfaces, required by construction documents shall be completed prior to the installation of the Drivable Grass® concrete erosion control system.
- C. Gradients for Drivable Grass® concrete erosion control mats can vary from flat to 50%. For steeper conditions, consult with manufacturer.
- D. Protect partially completed areas against damage from unintended construction traffic when work is in progress. Protect the perimeter of the installation area from erosions until vegetation establishment or final grades are finished.
- E. Areas adjacent to Drivable Grass® concrete erosion control system installation should be protected during construction.

**PART 2: PRODUCTS**

**2.01 Acceptable Manufacturer**

- A. Soil Retention Products, Inc., Corporate Office: 2501 State Street, Carlsbad, CA 92008. Phone: 760-966-6090 and 800-346-7995, Fax: 760-966-6099, Website: [www.soilretention.com](http://www.soilretention.com), E-mail: [sales@soilretention.com](mailto:sales@soilretention.com).
- B. No substitutions permitted. For approved equal status, equivalent field test data for a concrete product with similar characteristics shall be submitted. Compressive strength results shall not be based on sand/gravel infilled lab tests.

**2.02 Permeable, Flexible and Plantable Concrete Erosion Control System**

- A. Permeable, Flexible and Plantable Concrete Erosion Control System: Drivable Grass®
  - a. Nominal Dimensions (inches [l x w x h]) 24 x 24 x 1.5
  - b. Gross Area of Each Mat (square feet) 4
  - c. Weight of Each Mat (lbs) 48-49
  - d. Plantable Area (percent) 60
  - e. Mats per pallet (each) 60
  - f. Area Covered per Pallet (square feet) 240
  - g. Color\*\* Buff/Tan, Grey
  - h. Product Flexibility - Minimum radius of curvature (inches) 12
  - i. Concrete Compressive Strength @ 28 days in psi 8,000
  - j. Proprietary Grid Reinforcement Engineered Plastic

\*\*Other colors available for special order

- B. Underlayment Fabric – Geotextile or Rolled Erosion Control Blanket used directly below the Drivable Grass® concrete erosion control mats.
  - a. Rolled Erosion Control Blanket – A protective blanket of coconut fiber, straw, or other plant residue.
  - b. Miramesh TR - High-tenacity polypropylene yarns that are woven together to produce an open mesh geotextile.

- c. Filter fabric (Mirafi 140N) – A needle-punched, non-woven geotextile composed of polypropylene fibers.
- C. Bedding Course – Defined as the initial material directly below the underlayment fabric and Drivable Grass® concrete erosion control mats. For typical hydro-seeded, mulched and non-planted applications, a ½” nominal sand or native soil shall be used as determined appropriate by the design engineer. A uniform thickness and smooth finish surface of bedding between the subgrade and/or base layer, Underlayment Fabric and Drivable Grass® concrete erosion control mat is required. For grass seed planting applications, a minimum thickness of 2 inches of a thorough mix of 75% sand and 25% fine ground compost shall be used.
- a. Sand shall be clean, non-plastic, and free from deleterious or foreign matter. The sand shall be sharp and manufactured from crushed rock. Do not use limestone screenings stone dust. The particles shall conform to the grading requirements shown below:

ASTM C33 CSA A23.1-M94

Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300mm)	5 to 30
No. 100 (0.15mm)	2 to 10

- b. Compost material is defined as finely ground, well screened composted products such as composted manures, mushroom compost or green-waste compost. Material should be able to mix well with sand, able to hold moisture, and provide nutrient.
- D. Spikes (if required) – Used when Hydraulic Velocity and Shear greater than values supported in test documentation or as required by the design engineer. Stakes, when necessary, shall consist of 8-inch galvanized ring shanks (1/4” gauge, 9/16” head).
- E. Grass - Use approved seed or hydroseed mix appropriate for the site-specific application or as indicated by project specifications.
- F. Seed Cover (if required)– Use approved seed cover to retain moisture during germination of seed.
- G. Base Aggregate\* (If Required) - Defined as a structural base section to be used below the system for drivable applications.

Local, state or provincial standards for aggregate base materials for roads should be used for the gradation and quality of dense-graded aggregate base materials. If no standards exist, follow ASTM D 2940, Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports. The gradation for base material from this standard is given in Table 1 below. This material should be compacted to a minimum of 95% standard Proctor density per ASTM D 698. For planted applications, verify aggregate does not include harmful materials that could prevent healthy root growth.

Table 1  
ASTM D 2940  
Gradation for Dense-Graded, Crushed Stone Base

Sieve Size	Percent Passing
2 in. (50 mm)	100
1 1/2 in. (37.5 mm)	95 to 100
3/4 in. (19.0 mm)	70 to 92
3/8 in. (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (0.600 mm)	12 to 25
No. 200 (0.075 mm)	0 to 8

\*For California installations, Caltrans Class II Base is recommended.

### **PART 3: EXECUTION**

#### **3.01 Subgrade Preparation**

- A. Vertical depth to accommodate design section for Drivable Grass<sup>®</sup> concrete erosion control mat thickness, Underlayment Fabric thickness, Bedding Course thickness (if any), and Base Aggregate layer (if any).
- B. Excavate to the lines and grades shown on the construction drawings.
- C. Install any edging as specified.
- D. Proof roll subgrade area as directed by engineer to determine if remedial work is required.
- E. Over-excavation and replacement of unsuitable subgrade soils with approved compacted fill as directed by engineer.
- F. Owner's representative shall inspect the subgrade and approve prior to placement of Drivable Grass<sup>®</sup> concrete erosion control system components.
- G. Install irrigation system (if required) to the specified depth and location as required by the contract drawings.

#### **3.02 Installation of Aggregate Base and Bedding Layer (if required)**

- A. Install and compact aggregate base as required by the contract drawings. The recommended base surface should be +/- 3/8" over a 10 ft. straight edge.
- B. Install, level to a uniform thickness, and compact bedding course upon which Underlayment Fabric will be placed.

#### **3.03 Install Underlayment Fabric**

- A. Install underlayment fabric in accordance with the manufacturer's guidelines.

#### **3.04 Install Drivable Grass<sup>®</sup> Concrete Erosion Control Mats**

- A. Install permeable, flexible, and plantable Drivable Grass<sup>®</sup> concrete erosion control mat in accordance with the manufacturer's guidelines directly atop the Underlayment Fabric.
- B. Install mats to the line, grades and locations required by the contract documents.
- C. Install mats in one axial direction. Butt concrete mats against each other leaving no significant gaps. Adjust mats as required to maintain good grid pattern alignment. The vertical tolerance from mat to mat should be relatively flush with excessive lipage limited (maximum 1/8" difference in height from mat to mat).
- D. Install four stakes (if required) per mat as required per manufacture's guidelines.

**3.05 Fill Drivable Grass<sup>®</sup> Concrete Erosion Control System with Infill Material (if required)**

- A. Infill for planted applications is to be comprised of the same material as the bedding course.
- B. Spread infill uniformly across the mats with a push broom. Leave the infill about ¼" below the concrete pad surface.

**3.06 Vegetate Drivable Grass<sup>®</sup> Concrete Erosion Control System**

- A. Install planting materials as specified in the construction drawings. Seeding, hydroseeding, stolonizing, and plugging, may be acceptable provided that planting is conducted in accordance with the project documents.

**3.06 Field Quality Control**

- A. The Owner shall engage inspection and testing services to provide quality assurance during construction. This does not relieve the Contractor from securing the necessary control testing during construction when required by the contract documents.
- B. Qualified and experienced technicians and engineers shall perform testing and inspection services.
- C. As a minimum, quality assurance testing should include subgrade soil inspection; aggregate base (if any) and bedding (if any) type, quality, thickness, compaction; Underlayment Fabric placement; Drivable Grass Concrete Erosion Control Mat placement and staking (if required); and observation of construction for general compliance with design drawings and specifications.
  - a. The final surface tolerance of the concrete mats shall not deviate more than +/- 3/8" over a 10-ft straightedge.
  - b. The surface elevation of the concrete mats shall be 1/8" to 1/4" above adjacent drainage inlets, concrete collars or inlets.
  - c. Lippage: No greater than 1/8" difference in height between concrete mats.

**3.07 Protection**

- A. Avoid significant run-on during plant establishment and stay off planted areas until established. The contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.