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**Greenville County Technical Specification for:**

**EC-09 TRANSITION MAT**

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**1.0 Transition Mat**

**1.1 Description**

Use Transition Mats as a permanent replacement for rock rip rap at culvert and pipe outlets, parking lot discharge areas, and overflow structures. Additional applications include stream bed protection, stream bank stabilization, and shoreline protection. Use in conjunction with soil anchors and appropriate soil cover to prevent erosion. Vegetation provides functional and aesthetic benefits, but is not required for transition mat performance.

**1.2 Design Criteria**

Table 1 provides reference for installation configuration. Install Transition Mats according to the specific manufacturer's specifications.

**Table 1: Reference Table**

| <b>Pipe Diameter<br/>(inches)</b> | <b>Discharge<br/>(cfs)</b> | <b>Transition Mat<br/>Width x Length</b> |
|-----------------------------------|----------------------------|--|
| 12                                | 8                          | 4' x 4'                                  |
| 24                                | 30                         | 4' x 8'                                  |
| 36                                | 75                         | 8' x 12'                                 |
| 48                                | 100                        | 12' x 16'                                |
| 60+                               | 150                        | 12' x 20'                                |

**1.3 Materials**

Use a Transition Mat made of a semi-rigid nontoxic polymer (100% synthetic material) that contains no biodegradable or photo-degradable materials that are resistant to common pollutants found in stormwater runoff. Use Transition Mats that have open spaces throughout the structure to enable vegetative growth. Use Transition Mats that are mechanically anchored into the ground. The use of the specified anchors, and in some cases connectors, is essential to performance and longevity.

Use Turf Reinforcement Mats (TRMs) under Transition Mats when specified on the plans or by the ENGINEER.

Use Transition Mats conforming to the performance and physical requirements shown in Table

**Table 2: Minimum Requirements for Transition Mats**

| <b>Physical Property</b> | <b>Test Method</b>         | <b>Required Minimum Value</b> |
|--------------------------|----------------------------|-------------------------------|
| Mass/ Unit Area          | ASTM D 6566                | 0.90 lbs/ft <sup>2</sup>      |
| Thickness                | ASTM D 6525                | 0.40 inches                   |
| Percent Open Area        | Calculated from total area | 20% - 55%                     |
| Density                  | ASTM D 792                 | 0.90 g/cm <sup>3</sup>        |
| Specific Gravity         | ASTM D 297                 | 0.90 g/cm <sup>3</sup>        |
| UV Resistance            | ASTM D4355                 | 90% at 1000 hrs               |
| Shear Stress (vegetated) | ASTM D 6460                | ≥ 12.0                        |

### 1.3.1 Quality Assurance

At the time of delivery, provide the ENGINEER with the Transition Mat packing list containing complete identification, including but not limited to the following:

- Manufacturer name and location,
- Manufacturer telephone number and fax number,
- Manufacturer's e-mail address and web address, and
- Transition mat name, model and/or serial number.
- Certification that the specific transition mat meets the physical and performance criteria of this specification.
- Transition Mat manufacturer's installation sheet.

## 1.4 Construction Requirements

### 1.4.1 Working Drawings

Submit Working Drawings and design calculations from the manufacturer for approval prior to Transition Mat installation. Ensure that the Working Drawings include installation drawings, and instructions that completely describe the transition mat. Do not perform any work on the Transition Mats until Working Drawings have been accepted by the ENGINEER.

### 1.4.2 General Installation

Transition Mats require a specified manufacturer's anchor system for proper installation and long term effectiveness. Anchor Transition Mats for consistent contact over the entire soil surface. It is essential to minimize seepage flow between the Transition Mat and the underlying soil surface. Ensure the manufacturers' specified anchors are installed per the manufacturers' installation requirements.

### 1.4.3 Site Preparation and Installation

- Grade, level and smooth areas protected with Transition Mats and compact as indicated or as directed by the ENGINEER or manufacturer's representative.
- Remove large rocks, soil clods, vegetation, and other sharp objects that could keep the Transition Mat from intimate contact with subgrade.
- Remove and replace saturated soils for a solid base. Install appropriate soils under Transition Mat installations to improve the growing environment for vegetation.
- Prepare seedbed by loosening the top 2 to 3 inches of soil.
- Add seed, lime, and fertilizer as outlined in the Seeding Specifications.
- Install Transition Mat materials at or below the surface of the outlet.
- Construct as much channel expansion as possible (at least twice the width of the outlet pipe) to help reduce velocities and increase infiltration potential.
- Construct the downstream slope as long and flat as possible.
- Install Transition Mats to maintain intimate soil contact. Lay overlapping sections upstream over downstream and anchor and/or connect appropriately.
- Ensure the application area has adequate sunlight to establish and maintain vegetation.

#### 1.4.4 Turf Reinforcement Matting (TRM) Selection

Select the proper TRM Type as outlined in the TRM Specifications. The TRM is designated on the plans or by the ENGINEER.

#### 1.4.5 Anchoring

Anchor selection and layout is based on the maximum design conditions. Depending on the soil type and site conditions, anchor size, type and pattern is specified by the specific manufacturer's installation sheet.

#### 1.4.6 Connection Accessories

Use manufacturer recommended connection accessories when required. Follow specified placement and connection instructions.

#### 1.4.7 Delivery, Storage, and Handling

Follow the manufacturer's written storage and handling procedures for Transition Mat labeling, shipment, and storage. Clearly show the manufacturer or supplier name and Transition Mat length and width on product labels.

Store Transition Mats off the ground and cover them to adequately protect them from the following:

- Construction damage
- Extended exposure to ultraviolet radiation including sunlight
- On-site chemicals
- Flames including welding sparks
- Excess temperatures
- Other environmental conditions that can damage the physical properties of Transition Mats.

#### 1.4.8 Inspection and Maintenance

Inspect areas protected by Transition Mats for dislocation or failure every seven 7 calendar days and inspections are recommended within 24-hours after each rainfall event that produces ½-inches or more of precipitation until final stabilization is achieved.

Inspect to ensure that no gaps exist under the transition mat or between the joints of adjacent Transition Mats. Repair rills, gullies, and undercutting near the transition mat.

Ensure the anchoring is consistent with that shown on the manufacturer's installation sheet. If there is evidence that the Transition Mat is not securely fastened to the soil, install extra anchors to inhibit the Transition Mat from becoming dislodged.

Repair any damaged areas immediately by restoring the soil to its finished grade, Re-apply fertilizer and seed, and replace the appropriate TRM and Transition Mat material as needed.

Transition Mats are generally permanent installations and permanent maintenance should not be necessary. When utilized in a temporary installation, the Transition Mats and TRMs can be picked up and moved when appropriate.

#### 1.4.9 Acceptance

Obtain ENGINEER acceptance and approval for Transition Mat installations. When requested by the ENGINEER, ensure that a manufacturer's representative is on-site to oversee and approve the initial

Transition Mat installation. Obtain a letter from the manufacturer approving the installation when requested by the ENGINEER.