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## **SECTION 01 42 00**

### **ClosureTurf® QUALITY REQUIREMENTS REFERENCES AND DEFINITIONS**

#### **PART 1: GENERAL**

##### **1.01 SUMMARY**

###### **A. Section Includes:**

References and Definitions related to the ClosureTurf® product.

##### **1.02 RELATED SECTIONS**

- Section 31 23 13** - Subgrade preparation (Upper 6 inches of subgrade only)
- Section 01 42 00** - References and Definitions
- Section 01 60 00** - ClosureTurf® Product Specification
- Section 01 60 00** - ClosureTurf® MicroDrain® Product Specification
- Section 01 60 01** - ClosureTurf® MicroSpike® Product Specification
- Section 01 73 19** - ClosureTurf® Installation Specification
- Section 31 05 16** - ClosureTurf® Sand Infill Specification
- Section 03 49 01** - Alternate HydroBinder® Infill Specification
- Section 23 51 23** - ClosureTurf® HDPE Pressure Relief Valve Specification

### 1.03 REFERENCES

A. Latest Version of American Society for Testing and Materials (ASTM) standards:

ASTM D 792 – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement

ASTM D 1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

ASTM D 1204 - Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

ASTM D 1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

ASTM D 1505 - Standard Test Method for Density of Plastics by Density-Gradient Technique

ASTM D 1603 - Standard Test Method for Carbon Black Content in Olefin Plastics

ASTM D 1693 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

ASTM D 1907 - Standard Test Method for Linear Density of Yarn (Yarn Number) by the Skein Method

ASTM D 2256 - Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method

ASTM D 3218 - Standard Specification for Polyolefin Monofilaments

ASTM D 3895 – Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry.

ASTM D 4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.

ASTM D 4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

ASTM D 5261 - Standard Test Method for Measuring Mass per Unit Area of Geotextiles

ASTM D 5321 - Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method

ASTM D 5323 – Standard Test Method for Determination of 2% Secant Modulus for Polyethylene Geomembranes

ASTM D 5397 – Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

ASTM D 5596 - Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

ASTM D 5617 – Standard Test Method for Multi-Axial Tension Test for Geosynthetics

ASTM D 5721 – Standard Practice for Air-Oven Aging of Polyolefin Geomembranes

ASTM D 5885 – Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry

ASTM D 5994 – Standard Test Method for Measuring Core Thickness of Textured Geomembrane

ASTM D 6392 – Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

ASTM D 6693 – Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

ASTM D 6913 - Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

ASTM D 7007 – Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earth Materials

ASTM C 150 - Standard Specification for Portland Cement

ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar

ASTM D 1335 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings

ASTM D 1577 - Standard Test Methods for Linear Density of Textile Fibers

ASTM D 4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

ASTM D 5793 - Standard Test Method for Binding Sites per Unit Length or Width of Pile Yarn Floor Coverings

ASTM D 5823 - Standard Test Method for Tuft Height of Pile Floor Coverings

ASTM D 5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings

ASTM D 6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

American Concrete Institute (ACI) - 306R-10 Guide to Cold Weather Concreting

B. Latest version of Geosynthetics Research Institute (GRI) testing methods:

GRI-GM11– Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device.

GRI-GM12 –Measurement of the Asperity Height of Textured Geomembranes Using a Depth Gage

GRI-GM17 – Test Methods, Test Properties, and Testing Frequency and for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

GRI-GM19 - Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

## **1.04 DEFINITIONS**

- A. Definitions as related to the ClosureTurf® Product and the Construction Quality Assurance (CQA) Plan definitions for the product. Whenever the terms listed below are used, the intent and meaning will be interpreted as indicated.

### **Acclimation**

Physiological/thermal adjustment. Required in the geomembrane deployment process.

## **ArmorFill®**

Armor-Fill® Liquid Emulsion is a proprietary Polymer Emulsion product used to bind the ASTM-C33 sand infill component of the ClosureTurf® System.

## **ASTM**

ASTM International, known until 2001 as the American Society for Testing and Materials, is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

## **ClosureTurf®**

A patented 4 component system consisting of a Watershed Geosynthetics specific Gas Management System (if applicable), a Structured Geomembrane (LLDPE or HDPE), an Engineered Turf, and a specified grade of sand infill (or alternatively a HydroBinder® infill material).

## **Construction Quality Assurance (CQA)**

Construction Quality Assurance includes but is not limited to observations and documentation of materials and workmanship necessary to show that a particular project is being constructed according to site-specific specifications and within regulatory guidelines.

## **Construction Quality Assurance (CQA) Personnel**

Construction Quality Assurance (CQA) personnel are representatives of the Professional of Record (POR) who work under direct supervision of the POR. The CQA personnel are responsible for quality assurance monitoring, applicable conformance sampling and performing onsite tests and observations.

## **Construction Quality Assurance Professional of Record (POR)**

The POR is an authorized representative of the Owner and has overall responsibility for CQA efforts and to confirm the project was constructed in general accordance with site-specific specifications approved by the regulatory authority and contract documents. The POR must be licensed as a Professional Engineer in the State the project is located and experienced in geosynthetics.

## **Construction Quality Control (CQC) Personnel**

CQC Personnel are representatives of the Geosynthetics Installer who work under direct supervision of the Geosynthetics Installer. The Geosynthetics Installers' CQC Personnel are responsible for construction quality control, applicable conformance sampling and performing onsite tests and observations.

## **Contract Documents**

Written, printed, or electronic matter that provides information or evidence that serves as an official record and are issued by the owner or operator. The documents include bidding requirements that include but are not limited to, contract forms, contract conditions, contract specifications, CQA plan, contract drawings, addenda, and contract modifications.

## **Contract Specifications**

The requirements which are to be followed in the construction of the ClosureTurf<sup>®</sup> System. The standard specifications, supplemental specifications, special provisions, and all written or printed agreements and instructions that pertain to the method and manner of performing the work.

## **Contractor**

One that agrees to furnish materials or perform services at a specified price, especially for construction work.

## **Design Engineer**

An individual licensed to practice as a Professional Engineer or a Professional Service Firm that is responsible for the preparation of the project construction drawings and specifications.

## **Earthwork**

A general engineering term relating to the relocation and utilization of soil during the process of construction.

## **Engineered Turf**

A component of the ClosureTurf<sup>®</sup> System. A synthetic structured material consisting of one or more geotextiles tufted with polyethylene yarns that resemble grass blades.

## **Final Cover System Evaluation Report (FCSER)**

Upon substantial completion of closure activities, the POR is responsible for the documentation of construction activities relating to the project, and any other inspections or verifications required by the regulatory authority. The FCSEER will be signed and stamped by the POR and include documentation necessary for certification closure.

**Fish Mouth**

A semi-conical opening of the seam that is formed by an edge wrinkle in one sheet of the geomembrane component.

**Geomembrane**

A synthetic lining material that is a component of the ClosureTurf<sup>®</sup> System. Used as the primary barrier to infiltration and exfiltration of covered materials.

**GSI**

Geosynthetic Institute

475 Kedron Avenue

Folsom, PA 19033-1208 USA

TEL (610) 522-8440

FAX (610) 522-8441

**HydroTurf<sup>®</sup>**

A patented 3 component system consisting of a Structured Geomembrane Liner, a specialized Engineered Turf, and HydroBinder<sup>®</sup> infill material.

**HydroBinder<sup>®</sup>**

A proprietary pozzolanic infill utilized where higher surface water velocities may occur as well as in anchor trenches where specified.

**Geosynthetics Contractor / Installer**

The entity responsible for geosynthetic installation.

**HDPE**

High density polyethylene is a polyolefin material used to produce geomembranes.

**Independent Testing Laboratory**

An organization, person, or company that tests products and materials, etc. according to agreed requirements. The entity shall be independent of ownership or control by the Owner or any party to the construction of the final cover or the manufacturer of the final cover products used. The entity shall also have proper legal authority where required to issue opinions and document the results of tests requested by the Owner.

## **Installation Supervisor**

The person on-site who works for the Geosynthetics Installer and is in charge of the Geosynthetics Personnel and following the site specifications for the installation of the geosynthetics.

## **LLDPE**

Linear low density polyethylene is a polyolefin material used to produce geomembranes.

## **Manufacturing Quality Control (MQC)**

A planned system of inspection and verification to ensure the quality of the final product.

## **Nonconformance**

A deficiency in characteristics, documentation, or procedures that render the quality of an item or activity unacceptable or indeterminate. Examples of non-conformances include, but are not limited to, physical defects, test failures, and inadequate documentation.

## **Operator**

The entity in control and responsible for the facility.

## **Owner**

The entity that owns facility and land.

## **Owner's or Operators Representative**

An official representative of the Owner or Operator responsible for planning, organizing, and controlling construction activities.

## **Panel**

A general reference to a unit area of either the Structured Geomembrane (LLDPE or HDPE), or the Engineered Turf component of the ClosureTurf<sup>®</sup> System.

## **Quality Assurance**

A planned and systematic pattern of procedures and documentation to ensure that items of work or services meet the requirements of the contract documents.

## **Quality Control**

These actions provide a means to measure and regulate the characteristics of an



item or service to comply with the requirements of the contract documents.

### **Relief Valve**

A mechanical device used specifically to relieve gas buildup pressure underneath the ClosureTurf<sup>®</sup> system.

### **Representative Sample**

(With respect to geomembrane destructive testing) - A random specimen of either the Structured Geomembrane (LLDPE or HDPE) or the Engineered Turf component consisting of 1 or more cut pieces (commonly referred to as coupons) from the same rectangular portion of material, oriented along a seam that is removed for field or laboratory testing purposes.

### **Ripple**

Smaller in nature than a wrinkle. A result of thermal/or manufacturing that cannot be folded over.

### **Snapping**

A manual method to an open ended seam to remove tenting as a result of the welding of the geomembrane seams.

### **Spike**

A systematic design for interface friction located on the bottom of the Super Gripnet<sup>®</sup>.

### **Specimen**

(With respect to geomembrane destructive testing) - A specimen is the individual test strip (sometimes called coupon) from a sample location. A sample location can consist of many specimens.

### **Studs**

A systematic design for drainage located on the top side of the Super Gripnet<sup>®</sup>.

### **Surficial Collection Foot**

A manufactured device utilized specifically for collection of gas beneath the Super Gripnet<sup>®</sup>.

### **Surficial Strip**

A strip of Super Gripnet<sup>®</sup> used for gas conveyance below the ClosureTurf<sup>®</sup> system.

**Tenting**

A vertical ridge that is caused by wedge welding geomembrane.

**Wrinkle**

A portion of the geomembrane that does not lay relatively flat and is not a result of subgrade irregularity and which can be folded over.

**PART 2: PRODUCTS:**

*Not Used.*

**PART 3: EXECUTION:**

*Not Used.*

**END OF SECTION**