SECTION 312514.13 - HYDRAULICALLY-APPLIED EROSION CONTROL

This section includes specifications for flexible growth mediums.

1. GENERAL
	* + 1. SUMMARY
				1. This section specifies a hydraulically applied Flexible Growth Medium (FGM) composed of long strand, thermally processed wood fibers, crimped, interlocking fibers and performance enhancing additives. The FGM requires no curing period and upon application forms an intimate bond with the soil surface to create a continuous, porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth.
			2. SUBMITTALS

Only request submittals needed to verify compliance with project requirements.

* + - * 1. Submittals in this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Product Data: Submit manufacturer's product data and installation instructions. Include required substrate preparation, list of materials and application rate.
				3. Certifications: Manufacturer shall submit a letter of certification that the products meets or exceeds all physical property, endurance, performance and packaging requirements.
				4. Sample: One pound of seed in vendor’s unopened package with label and seed analysis.
			1. QUALITY ASSURANCE
				1. Field Examples: Seed samples will be taken by the Director’s Representative 30 days before sowing and sent to the New York State Experiment Station, Geneva, NY 14456, for testing. Test analysis will indicate species, purity, percent of germination, and weed content. Results will be sent directly to the Director for acceptance or rejection based on these tests. Pay all expenses incurred for testing.
			2. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials and products in UV and weather resistant factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.
				2. Deliver fertilizer in manufacturer’s standard size bags or cartons showing weight, analysis, and the name of the manufacturer. Store as approved by Director’s Representative.
				3. Store all seed at the site in a cool dry place as approved by the Director’s Representative. Replace any seed damaged during storage.
				4. Deliver seeds, 30 days in advance of anticipated use, in vendor’s unopened packages bearing labels showing vendor’s name and seed analysis by weight.
1. PRODUCTS
	* + 1. FLEXIBLE GROWTH MEDIUM
				1. Acceptable flexible growth medium manufacturer:

PROFILE Products LLC, 750 Lake Cook Road • Suite 440, Buffalo Grove, IL 60089 Phone: (847)-215-1140, Website: [www.profileproducts.com](http://www.profileproducts.com).

Approved equivalent.

* + - * 1. Materials:

Flexible Growth Medium: Flexterra FGM®, as manufactured by PROFILE Products LLC and shall conform to the following typical property values when uniformly applied at a rate of 3500 pounds per acre.

|  |  |  |
| --- | --- | --- |
| **PROPERTIES** | **TEST METHOD** | **TESTED VALUE** |
| **PHYSICAL** |
| Mass Per Unit Area | ASTM D-6566 | ≥11.6 oz/yd2 |
| Thickness | ASTM D-6525 | ≥ 0.22 in |
| % Ground Cover | ASTM D-6567 | ≥ 99% |
| Water Holding Capacity | ASTM D-7367 | ≥ 1700% |
| Material Color | Observed | Green |
| **PERFORMANCE** |
| Cover Factor (6 in/hr event)1 | Large Scale Testing | 0.01 |
| % Effectiveness | Large Scale Testing | ≥ 99% |
| Cure Time | Observed | 0-2 hours |
| Functional Longevity | ASTM D5338 | ≤ 18 months |
| Vegetation Enhancement | ASTM D7322 | ≥ 800% |
| **ENVIRONMENTAL** |
| Ecotoxicity | EPA 2021.0 | 48-hr LC50 > 100% |
| Effluent Turbidity | Large Scale Testing | ≤ 250 NTU |
| Biodegradability | ASTM D5338 | Yes |

*1 Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface. One minus Cover Factor multiplied by 100% equals % Effectiveness.*

Approved equivalent.

* + - * 1. Composition: All components of the FGM shall be pre-packaged by the Manufacturer to assure material performance and in compliance with the following values. Under no circumstances will field mixing of additives or components be accepted:

Thermally Processed Wood Fibers: 80%

Wetting agents (including high-viscosity colloidal polysaccharides, cross-linked biopolymers, and water absorbents): 10%

Proprietary Crimped, Interlocking Fibers: 5%

Micro-Pore Granules: 5%

* + - * 1. Packaging

Bags: Net Weight - 50 lb, UV and weather-resistant plastic film.

Pallets: Weather-proof, stretch-wrapped with UV resistant pallet cover 40 bags/pallet or 1 ton/pallet.

* + - 1. FERTILIZER
				1. Fertilizer: Mixed commercial fertilizers shall contain total nitrogen, available phosphoric acid and soluble potash in the ratio of 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN). The balance of the nitrogen shall be present as methylene urea, water soluble urea, nitrate and ammoniacal compounds.
			2. SEED
				1. Furnish fresh, clean, new-crop seed mixed in the proportions specified for species and variety, and conforming to Federal and State Standards.
				2. Acceptable material in a seed mixture other than pure live seed consists of nonviable seed, chaff, hulls, live seed of crop plants and inert matter. The percentage of weed seed shall not exceed 0.1 percent by weight.
				3. All seed will be rejected if the label or test analysis indicates any of the following contaminates: Timothy, Orchard Grass, Sheep Fescue, Meadow Fescue, Canada Blue Grass, Alta Fescue, Kentucky 31 Fescue, and Bent Grass.
				4. Provide the following seed mixture:

A = Min. Percentage of Germination

B = Min. Purity Percentage

C = Weight Pure Live Seed in Mixture

**SEED MIX “A”**

| **Name** | **Variety** | **A** | **B** | **C** |
| --- | --- | --- | --- | --- |
| Chewings Fescue(Festuca rubra commutata) | Banner, Highlight, Jamestown, or an approved equal. | 85 | 97 | 20 |
| Kentucky Bluegrass \*(Poa pratensis) | Barron, Flyking, Glade, or an approved equal. | 80 | 95 | 15 |
| Perennial Ryegrass \*\*(Lolium perenne) | Manhatten II, Pennfine, Yorktown II, or an approved equal. | 90 | 98 | 20 |
| Annual Ryegrass | Commercial | 98 | 97 | 45 |

1. EXECUTION
	* + 1. SUBSTRATE AND SEEDBED PREPARATION
				1. Examine substrates and conditions where materials will be applied. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope. Do not proceed with installation until satisfactory conditions are established.
			2. INSTALLATION
				1. Assume all risks when seed is sowed before approval of seed analysis.
				2. Do not seed when the wind velocity exceeds 5 miles per hour.
				3. Strictly comply with FGM manufacturer's installation instructions and recommendations. Use approved hydroseeding machines with fan-type nozzle (50-degree tip). To achieve optimum soil surface coverage, apply FGM from opposing directions to soil surface. Rough surfaces (rocky terrain, cat tracked and ripped soils) may require higher application rates to achieve 100% cover. Slope interruption devices or water diversion techniques are recommended when slope lengths (on a 3H:1V slope gradient) exceed 100 ft. Slope interruption intervals may need to be decreased based on steeper slopes or other site conditions. FGM is not recommended for channels or areas with concentrated water flow unless used in conjunction with a rolled erosion control product designed to accommodate the anticipated hydraulic conditions. Unless approved by the Manufacturer, no chemical additives with the exception of fertilizer, soil neutralizers and biostimulant materials should be added to this product.
				4. Erosion Control and Revegetation: To ensure proper application rates, measure and stake area. Apply FGM in a two-step process:

Step One: Mix and apply 50% of seed mix with all fertilizer and soil amendments with small amount of FGM for visual metering. Do not leave seeded surfaces unprotected.

Step Two: Mix balance of seed and apply FGM at a rate of 50 lb per 125 gallons (23 kg/475 liters) of water over freshly seeded surfaces. Confirm loading rates with equipment manufacturer.

* + - * 1. Mixing: A mechanically agitated hydraulic-application machine is recommended.

Fill 1/3 of mechanically agitated hydroseeder with water. Turn pump on for 15 seconds and purge and pre-wet lines. Turn pump off.

Turn agitator on and load low density materials first (i.e., seed).

Continue slowly filling tank with water while loading fiber matrix into tank.

Consult application and loading charts to determine number of bags to be added for desired area and application rate. Mix at a rate of 50 lb of FGM per 125 gallons.

All FGM should be completely loaded before water level reaches 75% of the top of tank.

Top off with water and mix until all fiber is fully broken apart and hydrated (minimum of 10 minutes — increase mixing time when applying in cold conditions). This is very important to fully activate the bonding additives and to obtain proper viscosity.

Add fertilizer and any other remaining amendments.

Shut off recirculation valve to minimize potential for air entrainment within the slurry.

Slow down agitator and start applying with a 50-degree fan tip nozzle.

Spray in opposing directions for maximum soil coverage.

The application rates below are for standard conditions. Application rates may need to be increased to accommodate very rough surfaces. Contact manufacturer for more information.

* + - * 1. Application Rates: Apply at the appropriate application rate selected from the table below.

|  |  |
| --- | --- |
| **CONDITION** | **APPLICATION RATE** |
| < 3H to 1V | 3000 lb/ac |
| >3H to 1V and < 2H to 1V | 3500 lb/ac |
| >2H to 1V and < 1H to 1V | 4000 lb/ac |
| >1H to 1V | 4500 lb/ac |
| Below ECB or TRM | 1500 lb/ac |
| As infill to TRM | 3500 lb/ac |

* + - 1. CLEANING AND PROTECTION
				1. After application, thoroughly flush the tank, pumps and hoses to remove all material. Wash all material from the exterior of the machine and remove any slurry spills. Once dry, material will be more difficult to remove.
				2. Clean spills promptly. Advise Owner of methods for protection of treated areas. Do not allow treated areas to be trafficked or subjected to grazing.
			2. FINAL ACCEPTANCE
				1. Final acceptance of lawn areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage. Portions of the lawn areas may be accepted at various times at the discretion of the Director’s Representative.
				2. Unacceptable lawn areas, hydro application: Reseed, fertilize, and mulch at one-half the specified rate, use full water rate.
				3. Once accepted, the State will assume all maintenance responsibilities.

END OF SECTION 312514.13