

Flexamat NF-UV-T

1. DESCRIPTION

Tied Concrete Block Mats (TCBM) with Net Free Underlayment and manufactured with a UV stabilized interlocking geogrid. This work shall consist of furnishing and placing the system in accordance with this specification and conforming with the lines, grades, design, and dimensions shown on the plans.

2. MATERIALS

TCBMs are manufactured from individual concrete blocks tied together with high strength UV resistant polypropylene bi-axial geogrid. Each block is tapered, beveled and interlocked and includes connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement.

Tied Concrete Block Mats shall be Flexamat NF-UV-T, manufactured by Motz Enterprises, Inc.

- 2.1. **Blocks.** Blocks are manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Meet a minimum compressive strength of 5,000 psi at 28 days. Blocks have a minimum weight of 3 lbs. per block and placed no further than 2 in. apart. Material shall have a weight per square foot not exceeding 10 lbs. Blocks have a 2.25" profile, a flat-top pyramid shape, and a coarse finish without protrusions. Concrete shall have a minimum compressive strength requirement of Table 1, certified by a third party.

Table 1
Concrete Compressive Strength Requirements

| Age | Required Compressive Strength psi |
|----------|-----------------------------------|
| 7 - Day | 5000 psi |
| 14 - Day | 6000 psi |
| 28 - Day | 6900 psi |

- 2.2. **Polypropylene Bi-Axial Geogrid.** The interlocking geogrid shall be composed of polypropylene multifilament yarns knitted in tension and designed to resist degradation in environments with exposure to ultra-violet light, water and low pH (<4 pH) and high pH (>9 pH). Carbon black UV inhibitor shall be blended into the extruded yarns at a rate no less than 0.8% by weight. The geogrid shall then be subsequently coated with a high ultra-violet resistant synthetic rubber blend coating with a tan color (for identification). When combined with the revetment mat, this will yield a durable, high tenacity, low elongating, and continuous filament polypropylene fibers that is securely cast into and embedded within the base of the concrete blocks and obtains connection strength greater than that of the geogrid. Ensure the geogrid meets physical and ultra-violet resistance requirements of Table 2.

Table 2 - Polypropylene Bi-Axial Geogrid Properties

| Property | Unit | Test | Requirement |
|--|--------------------|------------|------------------------|
| Mass/Unit Area | oz/yd ² | ASTM D5261 | 6.5 oz/yd ² |
| Aperture Size | English units | Measured | 1.4x 1.4 inch |
| Ultimate Wide Width Tensile Strength (MD x CMD) | lb/ft | ASTM D6637 | 2,055 lb/ft |
| Elongation at Ultimate Tensile Strength (MD x CMD) | % | ASTM D6637 | ≤ 8% |
| Wide Width Tensile Strength @ 2% (MD x CMD) | lb/ft | ASTM D6637 | 822 lb/ft |
| Wide Width Tensile Strength @ 5% (MD x CMD) | lb/ft | ASTM D6637 | 1,640 lb/ft |
| Tensile Modulus @ 2% (MD x CMD) | lb/ft | ASTM D6637 | 41,100 lb/ft |
| Tensile Modulus @ 5% (MD x CMD) | lb/ft | ASTM D6637 | 32,800 lb/ft |
| UV Resistance (4000 hr) | % retained / hr | ASTM G154 | 100% Retained Strength |
| Color | Color Chart | Visual | Tan |

- 2.3. **Underlayment material included within Flexamat NF-UV-T rolls** – Net free wood Excelsior underlayment. System underlayment material are packaged within the TCBM rolls to ensure proper installation.

Net Free Wood Excelsior Underlayment

Net Free Wood Excelsior Underlayment consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. Net Free Wood Excelsior layer is 100% biodegradable.

Physical Properties of Net Free Wood Excelsior

| | |
|---------------------------|----------------------------|
| Fiber Count | ≈7,000 per yd ² |
| Fiber Length (80% min.) | ≥ 6.0 in |
| Mass per Unit Area (+10%) | 0.73 lb/yd ² |

| Index Property | Test Method | Requirement |
|--------------------------|------------------|--|
| Thickness | ASTM D 6525 | 0.39 in |
| Light Penetration | ASTM D 6567 | 38% |
| Resiliency | ASTM D 6524 | 66% |
| Mass per Unit Area | ASTM D 6475 | 0.64 lb/yd ² |
| MD-Tensile Strength Max. | ASTM D 6818 | 158.4 lb/ft |
| TD-Tensile Strength Max. | ASTM D 6818 | 14.5 lb/ft |
| MD-Elongation | ASTM D 6818 | 14% |
| TD-Elongation | ASTM D 6818 | 7.7% |
| Swell | ECTC Procedure | 96% |
| Water Absorption | ASTM D 1117/ECTC | 278% |
| Bench-Scale Rain Splash | ECTC Method 2 | SLR = 6.8464 @ 2 in/hr ^{2,3} |
| Bench-Scale Rain Splash | ECTC Method 2 | SLR = 7.19 @ 4 in/hr ^{2,3} |
| Bench-Scale Rain Splash | ECTC Method 2 | SLR = 7.56 @ 6 in/hr ^{2,3} |
| Bench-Scale Shear | ECTC Method 3 | 2.6 lb/ft ² @ 0.5 in soil loss ³ |
| Germination Improvement | ECTC Method 4 | 645% |

¹ Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

2.4. Cover the TCBM or otherwise protect it during long periods of storage to protect against degradation of the backing material as recommended by the manufacturer.

2.5. TCBM will be rolled for shipment and packaged with lifting straps.

All mats to be inspected upon delivery. Assure that all units are sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the engineer. Replace, repair or patch the damaged areas per the manufacturer's recommendations.

3. PERFORMANCE PROPERTIES

| Test | Tested Value | Bed Slope | Soil Classification | Limiting Value |
|-----------|--------------|-----------|---------------------|-----------------------|
| ASTM 6460 | Shear Stress | 30% | Sandy Loam (USDA) | 24lb./ft ² |
| ASTM 6460 | Velocity | 20% | Loam (USDA) | 30 ft./sec |

4. EQUIPMENT

Provide the proper equipment to place the mat that will not damage the mat material or disturb the soil subgrade and seed bed.

5. CONSTRUCTION

Prior to installing Flexamat Plus UV-T, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 in. above the adjoining blocks. When seeding is shown on the plans, provide subgrade material that can sustain growth.

Ensure the prepared subgrade provides a smooth, firm, and unyielding foundation for the mats. The subgrade shall be graded into a parabolic or trapezoidal shape to concentrate flow to middle of mat or mats.

Distribute seed on the prepared topsoil subgrade before installation of the tied concrete block mats in accordance with the specifications.

Install mats to the line and grade shown on the plans and per the specification. The manufacturer or authorized representative will provide technical assistance during preparation and installation of the concrete block mats as needed.