TENDER SPECIFICATION

FOR SUPPLY OF THREE DIMENSION GEOSYNTHETIC MAT FOR EROSION CONTROL

PART 1 - GENERAL

1.1 Scope of work

.1 This specification covers the requirements for the manufacture, fabrication, supply, and installation of the erosion control mat to the material specifications stated herein, as per the bill of quantity and schedule of supplies enclosed. The geosynthetic Mat and its individual components shall meet or exceed the requirements of this specification. The manufacture, handling, storage, and installation shall be performed in accordance with the procedures provided in this specification.

.2 The CONTRACTOR shall provide all labor, materials, tools, equipment, and perform all operations necessary to furnish, deploy, and install the Drainage Composite in the areas indicated on the Drawings or as required by the ENGINEER, the OWNER or his representative.

1.2 Qualifications

.1 The CONTRACTOR shall have demonstrated experience in the installation of geosynthetic Mat, have installation staff trained by the MANUFACTURER, or work under the guidance of a representative approved by the MANUFACTURER.

.2 The CONTRACTOR shall be trained and experienced in field handling, storing, deploying, and installing geosynthetic materials. Alternatively, CONTRACTOR shall engage an experienced Subcontractor who shall meet the experience requirements.

1.3 Quality Assurance

.1 The quality management system of the MANUFACTURER shall conform to the requirements of ISO 9001:2015

.2 The In-house Laboratory performing Manufacturing Quality Control shall hold a valid GAI-LAP Accreditation, as well as ISO/IEC 17025:2017 Accreditation from NABLfor the tests performed in Manufacturing Quality Control.

.3 The MANUFACTURER shall issue a report stating minimum average roll values and results of the test conducted on samples from the rolls delivered to the project at the time of shipment is made. The number of samples tested should be at least one sample per production lot, and at least one sample every 10,000 m². The following properties must be declared:

- Weight of the geosynthetic Mat
- Thicknessof the geosynthetic Mat
- Tensile properties of the geosynthetic Mat

.4 The ENGINEER, the OWNER or his representative may visit the facility where the product is manufactured and review the quality control procedure as well as the storage and handling conditions at the plant, at their expense.

.5 Indigenously manufactured geosyntheticMat should be preferred, considering advantages of shorter delivery periods, no inventory pile-up and cost being unaffected by fluctuation of exchange rate of foreign currency.

.6 A representative of the OWNER or the ENGINEER shall observe and document the unloading, storage, deployment, and installation of the geosynthetic Mat.

.7 If required by a Construction Quality Assurance (CQA) Plan, then OWNER or ENGINEER shall obtain samples of the geosynthetic Mat for conformance testing at the sampling rate defined by the CQA Plan. Each sample shall be at least 600 mm long, taken across full width of the geosynthetic Mat roll for each type of material furnished for Project.

a. When applicable, third party sampling,testing and related expenses will be covered by the owner.
b. Care must be given to put back the packaging in a way that will not expose the rolls to the weather after sampling.

1.4 Warranty

.1 Installation shall be warranted against defects in workmanship for a period of 1 year from the date that the installation is deemed complete.

1.5 Submittals

.1 The CONTRACTOR shall submit to the ENGINEER for approval data from the MANUFACTURER indicating that the properties of the proposed geosynthetic Mat conform to the requirements of this Specification.

.2 At least 15 days prior to installation, the CONTRACTOR shall submit to the ENGINEERquality control test results from the MANUFACTURERfor the rolls produced specifically for the project and certification that the material meets the requirements of this Specification.

.3 At least 15 days prior to installation, the CONTRACTOR shall submit to the ENGINEER:

- Description of proposed method of deployment and provisions for holding geosynthetic Mat temporarily in place until permanently secured.

.4 The CONTRACTOR shall provide all the above-requested documents without exception.

PART 2 - MATERIALS

2.1 General Requirements

.1 Thegeosynthetic Mat consists of:

c. A Three dimensional geosynthetic Mat acting as erosion control, comprised of three sets of parallel overlaid ribs integrally connected to form a shape made of high-density polyethylene formulated to resist the chemical environment typically prevailing in soils.

2.2 Properties of the geosynthetic Mat

.1 The Three dimensional geosynthetic Mat and its two main constituents are controlled during manufacturing.

.2 The Three dimensional geosynthetic Mat shall meet or exceed the values provided in Table 2.2-1. Properties shall be measured before assembly to the geotextiles.

Table 2.2–1 : Properties of the three dimensional serving as Erosion Control Application.

CHARACTERISTIC	STANDARD	UNIT	VALUE	TOLERANCE
Mass per unit area	EN ISO 9864 / ASTM D 3776	g/m^2	600	Typical
Thicknessat 2 kPa	EN ISO 9863-1 / ASTM D 6525	mm	6.5	Min.
TensileStrength (MD/CD)	ASTM D 5035	kN/m	6.0/2.0	Min.
Ultravoilet Stability@500Hrs	ASTM D 4355	%	80	Min.
Width	-	Meter	4.0	Min.

Note 1: MD: longitudinal direction; CMD: Transverse direction

2.3 Transportation, Storage and Handling

.1 General guidance established in ASTM D4873-16 should be followed for transportation, storage and handling of the geosynthetic Mat

.2 Packaging and Identification

a. Cover each roll with an opaque wrapping material for protection from damage due to shipment, water, sunlight, or contaminants while being stored or handled in accordance with this guide.

b. Each roll must be identified with a durable, gummed label, or equivalent, clearly readable on the roll packaging. Roll identification should include the name of the MANUFACTURER, product designation / style number, and the unique roll number. Identification should also include the width and length of the roll.

.3 Receiving and Storing at the job site

a. While unloading or transferring the geosynthetic Mat from one location to another, prevent damage to the wrapping and to the geosynthetic Mat itself. If practicable, use forklift trucks fitted with poles that can be inserted into the cores of rolls. The poles must be at least two thirds the length of the rolls to avoid breaking the cores and possibly damaging the geosynthetic mat. Slings may be used to carry relatively rigid rolls, provided that the slings do not cause damage to the rolls. Do not drag the rolls as damage may result.

b. Geosynthetic Mat, when possible, should be stored elevated of the ground and covered to ensure adequate protection from the following:

- Precipitation (because geosynthetic Mat roll goods saturation may lead to handling difficulties),
- Ultraviolet radiation,
- Undesirable chemicals for any extended period of time,
- Flames, including welding sparks,
- Temperatures in excess of 71°C and below 0°C, and
- Any other environmental condition that may affect the properties.

.4 On-Site Handling

a. While transferring geosynthetic Mat from one location to another, prevent damage to the wrapping and to the geosynthetic Mat itself. Follow the cautions specified in the previous section.

b. Before unrolling a roll of geosynthetic Mat at the job site, verify its identification. While unrolling the geosynthetic Mat, inspect for damage or defects.

c. Follow all applicable site or project specifications and recommendations from the MANUFACTURER for handling and installation.

d. Correct any damage that occurs during storage or installation as directed by the project specifications and the ENGINEER in charge of installation.

PART 3 - APPROVED MANUFACTURERS

3.1 List of Approved Manufacturers

.1 The following is a list of pre-approved supplier of drainage composites

Techfab (India) Industries Ltd.

712 Embassy Centre,

Nariman Point, Mumbai – 400 021

Phone: 022 – 2287 6224/6225

Fax: 022 – 2287 6218

PART 4 - DELIVERY

4.1 Delivery

.1 Delivery of geosynthetic Mat shall be done according to the delivery schedule.

PART 5 - PAYMENT

5.1 Method of Measurement

.1 Thegeosynthetic Mat will be measured by Square Meter of material received at the owner's / contractor's store.

5.2 Basis of Payment

.1 Payment for the supply of the geosynthetic Mat shall be made at the contract unit price per Square Meter, which shall be full compensation for the cost of materials, transportation, duties and taxes.

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