TENDER SPECIFICATION

FOR SUPPLY OF UNIAXIAL GEOGRID

(FOR REINFORCED SOIL SLOPE & RE WALL APPLICATION)

1.0 GENERAL

This work comprises supply of Knitted & PVC Coated Polyester Uniaxial GeoGrid as Reinforced Soil Slope and RE Wall conforming to the material specifications stated herein, as per the bill of quantity and schedule of supplies enclosed.

2.0 MATERIALS

2.1 General Requirements

The Geogrid should be manufactured from high tenacity polyester filament yarns with molecular weight ≥25000 g/mol when measured in accordance with GRI-GG8 / ASTM D4603 and carboxyl end groups ≤ 30 mmol/Kg when measured in accordance with GRI GG7 / ASTM D2455.

The yarns shall be formed into a dimensionally stable grid structure with uniform square or rectangular apertures using a weft insertion warp knitting process (woven type Geogrids, Extruded type Geogrids, Welded type Geogrids will not be permitted and not accepted).

The Geogrid shall have a durable PVC coating to protect the yarns from mechanical damage and adverse environmental effects (LDPE coated, latex coated and no other coatings will be permitted and not accepted).

The Geogrid shall be resistant to the chemicals and microorganisms normally found in soils and shall be stabilized against short-term exposure to solar radiation

Indigenously manufactured Geogrids should be preferred, considering advantages of shorter delivery periods, no inventory pile-up and rates being not affected by fluctuation of exchange rate of foreign currency.

A plant visit by the Engineer's representative to verify the manufacturer's quality control procedures and witness testing of products is also required prior to the dispatch of material.

2.2 Transportation, Storage and Handling

All rolls shall have a protective cover with a label or tag specifying name of the product, name of the manufacturer, roll number, date of manufacture and roll dimension.

Material shall be protected from sunlight, mud, dirt, debris, any other harmful substances or mechanical damage during transportation.
Rolls shall be stored in a secured area sufficiently elevated above the ground and adequately covered to protect them from the following: site construction damage, precipitation, prolonged exposure to ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, high temperatures, and any other environmental conditions that may damage the physical property values of the Geogrid.

Any material, which is damaged during transportation, handling or storage and do not meet the minimum requirements of the specifications is liable for rejection by the Engineer.

2.3 Quality Control & testing

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

Manufacturer Laboratory shall accredited by the National Accreditation Board for Testing Laboratories (NABL) as per ISO/ IEC 17025: 2005 standards and GAI LAP Accreditation by Geosynthetic Institute USA.

Manufacturer shall issue a test report stating minimum average roll values of material properties, at the time of shipment is made.

BBA certificate for Constructionof slopes (Design and Management) and CE-certification as per 2016 standards (BTTG certification) should be required for supply of material.

Manufacturer shall submit the proof of supply and satisfactory performance for the quantity of 10000 Sqmt at least, for projects in India.

Contractor shall furnish proof of all above and it is mandatory.

2.4 Physical and Mechanical Properties

The Mechanical properties of knitted and PVC coated uniaxial geogrid shall conform to Table-1 below:

Table-1

Property		Test Method	Unit	TG U 40	TG U 60	TG U 80	TG U 100	TG U 120	TG U 150	TG U 200	TG U 250	TG U 300	TG U 350	TG U 400
Ultimate tensile strength[1]	MD	ASTM D 6637	kN/m	40	60	80	100	120	150	200	250	300	350	400
	CD			20	20	30	30	30	30	30	30	30	30	30
Reduction Factors (RF) and factor of safety (f_s) for calculation of MD Long-term Design Strength(LTDS)														
Creep (RF_{CR}) -120 years design life at 30° C temperature				1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
Installation damage (RF_{ID})	Sand/silt/clay			1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
	Coarse gravel (37.5 mm)			1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Durability (RF_{CH}), 120 years design life at 20°C, pH = 4 to 9				1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Weathering (RF_W)	To be covered in 1 day			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LTDS – 120 years : Sand/silt/clay pH -4-9 kN/m				21.10	31.65	42.20	52.75	63.30	79.12	105.50	131.9	158.25	184.62	211.00
LTDS – 120 years : Gravel < 37.5 pH -4-9 kN/m				19.26	28.89	38.53	48.16	57.79	72.24	96.32	120.4	144.49	168.57	192.65
Physical properties														
Aperture size (Tolerance± 3 mm)			mm	50x25	50x25	50x25	30x23	30x23	30x23	30x23	30x22	30x20	30x20	30x18
Roll dimensions														
Roll length			m	100			100							
Roll width			m	5.0			5.1							

[1] Minimum average roll value (Minimum refers to 95 % confidence limit.) MD – Machine Direction
CD – Cross Direction.

3 INSTALLATION

3.1 Site Preparation

The site shall be prepared by clearing, grubbing, and excavation or filling the area to the design grade. This includes removal of topsoil and vegetation.

3.2 Laying of Geogrid

The geogrid shall be laid smooth without wrinkles or folds on the prepared subgrade (or within the granular subbase / base course if

shown in the drawings) with the machine direction oriented in the direction of traffic.

Adjacent geogrid rolls shall be overlapped as shown on the drawings. Unless otherwise shown on the drawings or directed by the Engineer, the minimum overlap shall be 300 to 500 mm for subgrade of CBR greater than or equal to 3 and 600 to 1000 mm for CBR between 1 and 3. All roll ends shall be overlapped by 1000 mm.

On curves, the geogrid may be folded or cut to conform to the curves. The fold or overlap shall be in the direction of construction and held in place by pins, staples, or piles of fill or rock.

Prior to placing subbase / base course material the installed geogrid shall be inspected and approved by the Engineer. Any damages shall be repaired by covering the damaged location with a geogrid patch, which extends an amount equal to the required overlap beyond the damaged area, as directed by the Engineer.

3.3 Placing and Compacting Subbase/base course

The subbase or base shall be placed by end dumping onto the geogrid from the edge of the geogrid or over previously placed subbase or base aggregate.

Movement of construction equipment directly over the geogrid shall not be permitted.

Sudden breaking and sharp turning of construction equipment shall be avoided on the first lift of subbase/base over the geogrid.

Any ruts occurring during construction shall be filled with additional subbase or base material, and compacted to the specified density

4 APPROVED MANUFACTURERS

4.1 Approved Manufacturers

(1) Techfab (India) Industries Ltd.
712 Embassy Centre,
Nariman Point, Mumbai – 400021
Phone: 022 – 2287 6224/6225
Fax: 022 – 2287 6218

5 DELIVERY

Delivery of Uniaxial geogrids shall be done according to the delivery schedule.

6 PAYMENT

6.1 Method of Measurement

Uniaxial geogrids will be measured by the Square Meter of material received at the owner's / contractor's store.

6.2 Basis of Payment

Payment for the supply of Uniaxial geogrids 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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