

TENDER SPECIFICATION
FOR SUPPLY OF TECHDRAIN P DRAINAGE COMPOSITE
(DRAINAGE LAYER IN ROAD PAVEMENTS)

1.0 GENERAL

This work comprises supply of TechDrain P Drainage Composite 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

Drainage Composite shall be made by thermo bonding a drainage core- Geonet comprises of two sets of parallel overlaid ribs integrally connected to have a rhomboidal shape made of High-density polyethylene, stabilized by carbon black, black colour and nonwoven geotextile, working as separation, filtration and protection layer made of polypropylene Needle punched & thermally bonded. These engineered Geotextiles shall be stabilized to resist degradation due to ultraviolet exposure and shall be resistant to commonly encountered soil chemicals, mildew and insects, and shall be non-biodegradable.

Indigenously manufactured Drainage Composite 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 Drainage Composite.

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

Pre supply approvals:

Prior to the supply of the material the supplier or manufacturer should ensure that the drainage composite shall meet the requirements as specified in the Table-1. Conformance testing shall be performed on random samples by the manufacturer or supplier in accordance with quality management system of the manufacturer which shall conform to the requirements of ISO 9001:2015 and In-house Laboratory should be certified with GAI-LAP and ISO/IEC 17025:2017 (NABL).

During Supply approvals:

After the finalization of the supplier, Nonwoven geotextile shall be provided for the third-party testing or testing shall be carried out at manufacturer's laboratory under supervision of Engineer in Charge. Testing for nonwoven properties shall be carried out over parent material, not from the final product of drainage composite, for that manufacturer shall have provide the same material for testing. The tests that are to be carried out are as mentioned in Table -1.

The in-house laboratory or the third-party laboratory wherein the material shall be tested should be certified with GAI-LAP and ISO/IEC 17025:2017 (NABL) with below mentioned.

Manufacturer should have well equipped testing facility and must provide the list of In-house laboratory equipment. Following method should must be performed In-house laboratory during witness test.

Sr No	Equipment	Test method
1.	Tensile Strength	EN ISO 10319, EN ISO 12236
2.	In-Plain water Flow	EN ISO 12958
3.	Permittivity & AOS	ASTM D 4491 & ASTM D4751

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

Manufacturer shall provide the third party certified short term flow of drainage capacity for pavement application.

Manufacturer shall provide the documentary evidence for the third-party certified reduction factors specified in table 1.

CE-certification of drainage composite should be required by supply of material

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

2.4 Physical and Mechanical Properties

The Mechanical properties of Drainage Composite shall conform to Table-1 below:

Table-1
(Confirming to relevant MORT&H, IRC OR BIS standard)

Property	Test Method	UOM	Value	Acceptance criteria
FILTER – GEOTEXTILE				
Structure: Needle punched or thermally bonded non-woven geotextile				
Raw Material: Polypropylene				
Characteristic opening size O ₉₅	ASTM D 4751	micron	220	Maximum value
Permittivity	ASTM D 4491	s ⁻¹	1.0	Minimum value
DRAINAGE CORE – GEONET				
Structure: Sets of parallel ribs overlaid and integrally connected having rhomboidal mesh openings				
Raw Material: High density polyethylene, stabilized by carbon black, black colour				
GEOCOMPOSITE				
Thickness	EN 9863-1	mm	4.5	Minimum value
Mass per unit area	EN ISO 9864	g/m ²	710	Minimum value
CBR puncture resistance	EN ISO 12236	N	3000	Minimum value
Tensile strength	EN ISO 10319	kN/m	16	Minimum value
In-plane flow capacity (MD)				
Hydraulic gradient i = 1 at 100 kPa pressure	EN ISO 12958	l/(m.s)	0.55	Minimum Value
Hydraulic gradient i = 1 at 200 kPa pressure			0.45	Minimum Value
Short Term flow capacity for pavement application		m/day	432	Minimum Value
Reduction Factor for Creep (30 Years)			1.1	Maximum Value
Reduction factor for Geotextile Intrusion (30 Years)			1.04	Maximum Value
Reduction factor for Chemical Clogging (30 Years)			1	Maximum Value
Reduction Factor for Biological Clogging (30 Years)			1	Maximum Value
Long term Flow for Pavement Application (30 Years)		m/day	377	Minimum Value

Note : Transmissivity Measured value may vary between individual labs

MD – LONGITUDINAL DIRECTION

INSTALLATION

3.1 Site Preparation

As per the requirement of the application for the drainage, site / surface shall be prepared and should be in line with the level required for the placement of the material.

3.2 Laying of Drainage Composite

For pavement drainage application, the Drainage Composite shall be laid smooth without wrinkles or folds on the prepared subgrade and or prepared surface if shown in the drawings with the cross-machine direction oriented in the direction of traffic.

Adjacent rolls (only outer layer of geotextile & not inner core) shall be overlapped as shown on the drawings. Unless otherwise shown on the drawings or directed by the Engineer, the minimum overlap shall be 100 to 150mm. The same process shall be followed for all roll ends with minimum overlap of 300mm.

On curves, the Drainage Composite may be cut to conform to the curves. The fold or overlap shall be in the cross direction of construction and held in place by pins.

Prior to placing fill material as per project requirements the installed Drainage Composite shall be inspected and approved by the Engineer. Any damages shall be repaired by covering the damaged location with a Drainage Composite patch, which extends an amount equal to the required overlap beyond the damaged area, as directed by the Engineer.

3.3 Placing and Compacting Fill Material

The fill material shall be compacted on the drainage composite as per project requirements. Movement of construction equipment directly over the Drainage Composite shall be to minimum extent possible.

Sudden breaking and sharp turning of construction equipment shall be avoided over the laid Drainage Composite.

Any ruts occurring during construction shall be filled with additional fill 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 – 400 021
Phone: 022 – 2287 6224/6225
Fax: 022 – 2287 6218

5.0 DELIVERY

Delivery of TechDrain P Drainage Composite shall be done according to the delivery schedule.

6.0 PAYMENT

6.1 Method of Measurement

TechDrain P Drainage Composite 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 TechDrain P Drainage Composite 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.