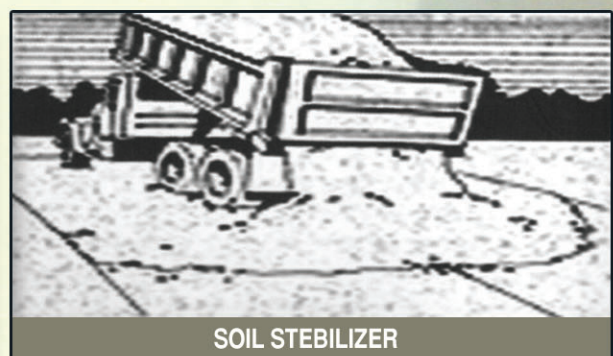
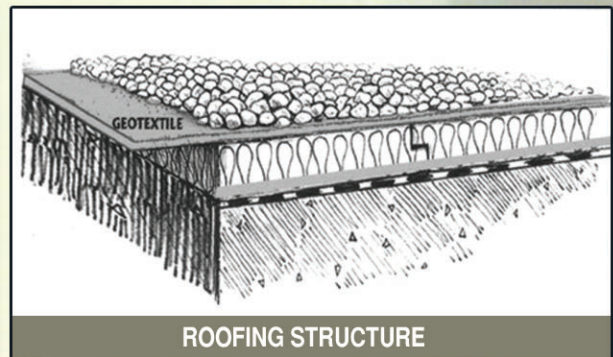
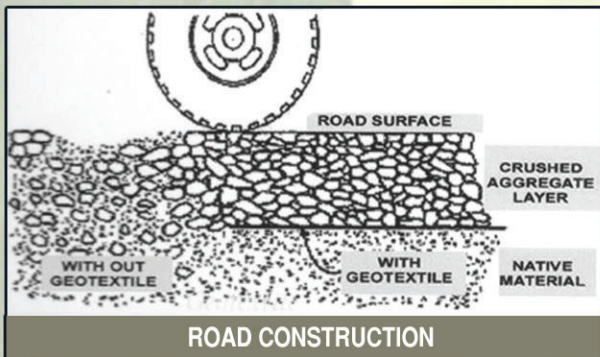




SALAND INDUSTRIES, LTD.

Geotextile





GEOTEXTILE

Product Description:

S - Geotextile fabric: is a high performance polymeric nonwoven based on polyester / PET and Polypropylene / PP stable fibre with low creep and a high degree of dimensional stability. The products are designed to fulfil all civil engineering and other construction industry requirements.

S - Geotextile fabric, technical process is Carded web bonded through Needle - Punch and/or Thermofixed. The state of the art process enables fabrics to be made with controlled superior properties, in dimensional stability, filtration, UV resistance and flexibility. The manufacturing operations (quality system procedures) are certified in accordance to ISO9001:2000 international quality system certificate.

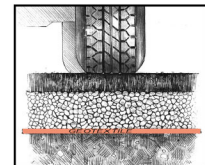
Geotextile Functions:

Geotextile are flexible fabrics of controlled permeability used to provide protection, filtration, separation, reinforcement and drainage functions in soil, rock, waste materials. They are also specifically used as separation and protection layers within structural waterproofing systems, or as protection and moisture mats within the roofing system, Following are the most prominent functions Geotextiles perform in civil engineering and construction industry

1. Civil engineering

Filtration, Separation and Protection:

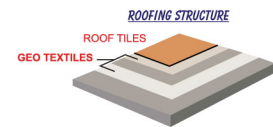
- > Drainage system, Waste Containment, Canals, Rivers, Sea work
- > Soil Stabilization / Erosion control.
- > Load Distribution, Road, Railway, Airport
- > Paving & Repaving.



2. Building Construction

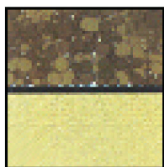
Roofing system & sub- structure :

- > Protection and a separation layer for thermal insulation
- > Protection layer for waterproofing materials.
- > Roofing and Re-roofing (inverted roofing system)
- > Sub structure, Foundation, underground structure



Typical function of civil engineering applications are define as follows:

Filtration: Filtration is one of the functions most widely performed by Geotextiles. The filtration function has two concurrent objectives; to retain the particles of the filtered soil, while permitting water to pass through the plane of the geotextile from the filtered soil. These two parallel roles are the key to filtration design.



Separation: Separation refers to the ability of geotextiles to prevent the mixing of two materials, such as soft subgrade with clean base aggregate.

Reinforcement: Soil movement is reduced by the confinement and reinforcing action of the geotextiles, which function by absorbing part of the stress that normally would cause shear failure.



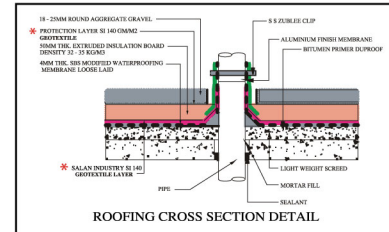
Drainage: The lengthwise permeability of the geotextile allows it to perform as a drain. The amount of drainage is proportional to the thickness of the fabric.



Typical Application of Geotextile

Roofing & Water Proofing System :

Roofing system: Geotextile is used in roofing system (inverted roofing system). To provide protection and separation layer for both; Thermal insulation, from puncture damage by the gravel and roofing tiles and the Waterproofing membrane, from being damaged by the friction effect due to their direct contact with thermal insulation boards.



Sub-structure: Non woven fabrics are also designed to protect waterproofing composite compounds / membrane used in the foundation (horizontal and vertical basement walls) from ground water, direct contact with soil and mechanical/physical traffic at construction site. (Refer to Saland cross section technical details)

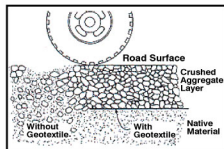
Drainage:

The main function provided by Geotextile in drainage systems is to **SEPARATE** the aggregate drainage media from the soil, and **FILTRATION** by preventing the transmission of fine soil particles into the drain. And void mixture between the two different layers. They are extremely effective in international drainage system such as French Drains pipe drains, vertical drains.



In general Geotextile acts as a filter between soil and drainage gravel, preventing soil particles from being carried away by the filtered water. The drainage gravel has a tendency to become clogged, and the soil has a tendency to be washed away.

Roads Construction :



The main function of Geotextile in road works is **STABILIZING**, the aggregate, **SEPARATION**, **FILTRATION**, **DRAINAGE** and **REINFORCEMENT**. Geotextiles provide long-term **SEPERATION** of the aggregate base from the subgrade soil, by separating these two materials; the fabric maintains the original thickness of the roadway aggregate.

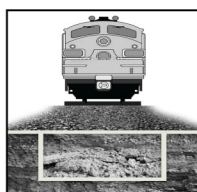
This is the most important function for roads, particularly where the road is being constructed on weak sub-grade soils.

Airport Runways:

In extraordinary heavy demands on the surface, Geotextiles provide stabilization to the foundation works and enabling them to counter vibrant loads. As a result of superior performance of the geotextiles, international studies have proved that funding required for the cracks sealing have been eliminated compared to taxi or runways of the same age that had not been constructed with geotextiles.



Railway Tracks:

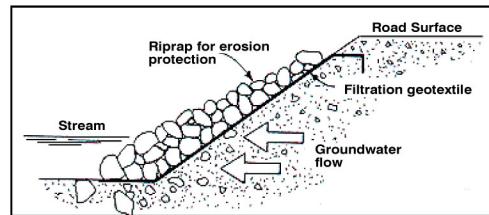


The highly accelerating speed and train loads place heavy demands on the bearing course. Geotextiles stabilize the foundation, prevent contaminations to the ballast, optimise the drainage capacity of the whole structure and hence enabling it to withstand with required loads. Track sections stabilized with the selected geotextile remain flat after years and years ensuring train operation on required speed and axle loads.



Soil Stabilization (Erosion Control):

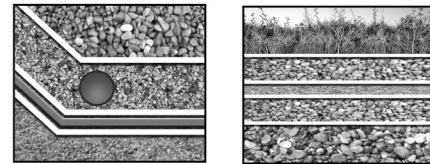
Geotextiles function to protect the shorelines through its flexibility and permeability by helping to counter the impact of waves and currents, hence stabilizing and preventing from erosion and washing out of fines. Man-made dams and embankments are required to be prepared with strong materials to resist the natural forces.



In harbour construction, Geotextiles are placed behind the retaining wall to keep the drainage layer clean which ultimately relieves the water pressure on the wall. Further, when Geotextiles are deployed in front of the retaining wall, Geotextiles prevent washing out of the sea bed. Geotextiles protect river banks and canals effectively and environment friendly way. In artificial lakes, the water-proof membrane is protected against perforation by Geotextiles.

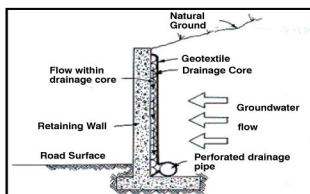
Waste Disposal:

During the last few years, there has been an increased focus on technical advancements in the design and construction of waste containment facilities. This has been in response to the demand for environmentally sound landfill sites. This emphasis has resulted in the increased consumption of geotextiles for waste containment applications.



At waste disposal sites and water purification systems, Geotextiles as top and bottom layers, protect the membranes from perforation.

Sub-structure :



Geotextiles contribute in sub-structures, concrete floors and for apartments sound impact suppression purposes. Placing under foundations, Geotextiles replace the blinding layer, which is simple, effective and economical. Under concrete flooring, the porous Geotextile protects the drainage layer from contamination to the concrete and the subsoil.

Geotextiel Special Technical Features

- > Excellent Chemical resistant to chemical compounds found in soil.
- > Excellent UV resistance
- > Excellent resistance to bitumen and hydro carbon compounds
- > Excellent resistance to water and seawater
- > Non biodegradable
- > Easy to install, flexible & contour easily around corners and footings.
- > Has no friction on the membrane, applied easily on vertical and horizontal surfaces
- > Membrane Colour white

Product Range

Geotextile fabrics constitute a complete range of PET (Polyester) and PP (Polypropylene) fabrics designed for use in various civil engineering requirements, are available according to application. Standard weight ranges from 100 to 1500 gm/m².

Other heavier and lighter grades / weights are available upon request. These are manufactured by Saland Industries Associates, in accordance with international standards.

Roll Size :

S Geotextile, are available in rolls of 4m width x 50m / 100m length. Other dimensions are available upon request. Materials are supplied wrapped with PE foil per roll, as a waterproofing and UV protection.



Installation Method :

Depending on type of application, design work and site condition, General tips on Geotextile application requirement is stated as follows:

- > Generally the surface on which the geotextile is to be placed shall be smooth surface free from debris and large cavity,
- > The fabric shall be placed loosely, no wrinkles and or folds,
- > Placing the Geotextile in close contact with the soil so that no void or spaces occur behind.
- > In roofing application, Geotextile fabrics must be applied on a sound clean substrate, on either thermal insulation board and waterproofing membrane
- > Underground, earth and road works all excavation should be completed.
- > Geotextile shall be joined by either sewing or overlapping. Overlapped fabrics shall have a minimum of 300 mm overlap.
- > Safety measure. Once installation has been completed, avoid any unnecessary traffic on the membrane, Avoid punching by construction equipment.

S Recommended GEOTEXTILE Product Range Vs. Application System

Application	SI-100	SI-110	SI-120	SI-140	SI-200	SI-250	SI-300	SI-350	SI-400	SI-450	SI-500
Roofing System	x	x	x	x							
Underground Structure				x	x	x					
Membrane protection				x	x	x					
Landscaping	x	x	x	x	x						
Soil Stabiliser/Erosion control							x	x	x	x	x
Drainage System				x	x	x					
Road Construction						x	x	x	x	x	

Other grades of SI Geotextile products, ranges from 50 gms to 1000 gms are available upon request.

Technical Support

Technical assistance related to product recommendation, installation and job design is available upon request. Contact Saland Industry Technical Team.

These Technical data are correct and may be changed without any prior notice subject to client requirements, development or other conditions. This technical data sheet supersedes all previous publications pertaining to this product. All reasonable care has been taken in preparing this document which to the best of our knowledge is accurate and true. Recommendation and suggestions are made in good faith and should be considered for general guidance. No liability is taken by us in relation to the a application, as usage conditions and any labour involved are beyond our control.



GEOTEXTILE

Roofing & Sub-Structure Application

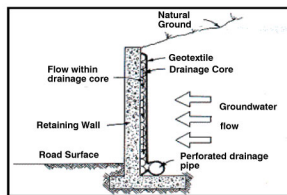
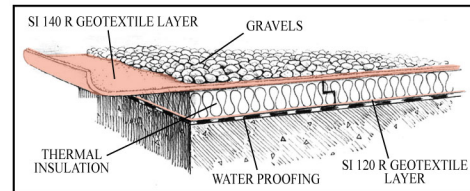
Function

- > Protection and a separation layer for thermal insulation
- > Protection layer for waterproofing materials.
- > Roofing and Re-roofing (inverted roofing system)
- > Sub structure, Foundation, under ground structure



Geotextile Product : Provide an economical and durable solution in accordance with the design and construction application requirement, below is the most typical application for roofing and sub structure:

Roofing System : Geotextile is used in roofing system (inverted roofing system). To provide protection and separation layer for both; Thermal insulation, from puncture damage by the gravel and roofing tiles and the Waterproofing membrane, from being damaged by the friction effect due to their direct contact with thermal insulation boards.



Sub-structure :

Non woven fabrics are also designed to protect waterproofing composite compounds / membrane used in the foundation (horizontal and vertical basement walls) from ground water, direct contact with soil and mechanical / physical traffic at construction sit.

GEOTEXTILE Product Range Recommended For Such Application

PET/ GEOTEXTILE, NEEDLEPUNCHED

Test Items	Unit	Test Method	SI -100	SI -110	SI -140	SI -200
Physical						
Basis Weight	g/m ²	EN ISO 9864	100	110	140	200
Thickness	mm	EN ISO 9863-1	1.4	1.5	1.8	2.3
Mechanical						
Tensile Strength MD Strip	kN/m	EN ISO 10319	5	6	8	13
Tensile Strength CD Strip	kN/m	EN ISO 10319	5	6	8	13
Elongation MD/CD	%	EN ISO 10319	70	70	70	70
Puncture Resistance CBR	N	EN ISO 12236	900	1200	1500	2200
Puncture Resistance cone drop	mm	EN ISO 13433	31	30	28	22
Hydrolysis						
Pore size O90%	microns	EN ISO 12956	105	100	100	75
Water Flow Normal to plane 100mm WH	l/m ² /s	EN ISO 11058	150	150	145	100
Water Flow Normal to plane 50mm WH	l/m ² /s	EN ISO 11058	90	87	85	60

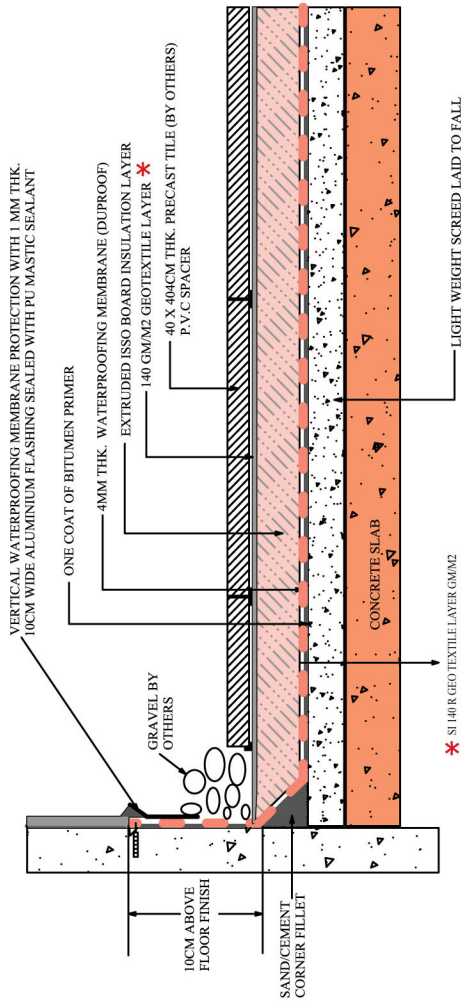
Typical Cross Section, for inverted Roofing System and Substructure are shown next.



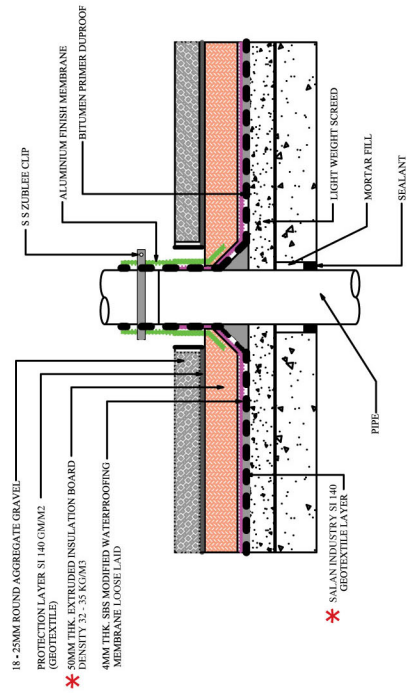
GEOTEXTILES APPLICATION IN THE CONSTRUCTION INDUSTRY

TYPICAL CROSS SECTIONS ROOFING & SUB-STRUCTURE

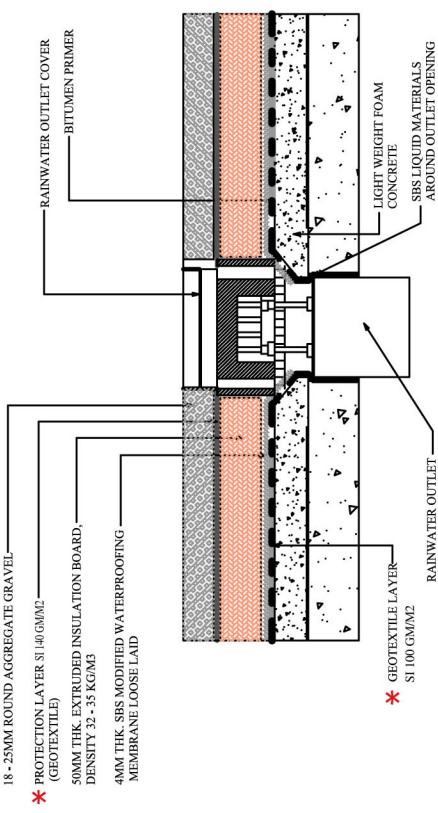
INVERTED ROOF WATERPROOFING SECTION DETAIL



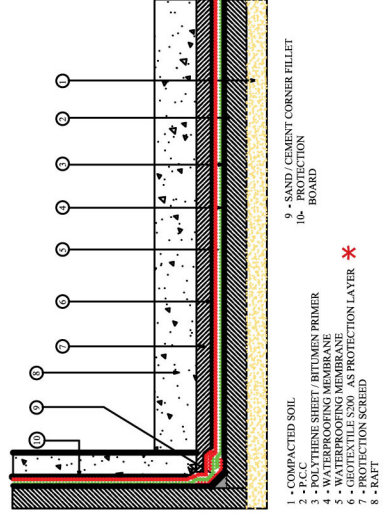
TYPICAL ROOF DRAIN CROSS SECTION DETAIL



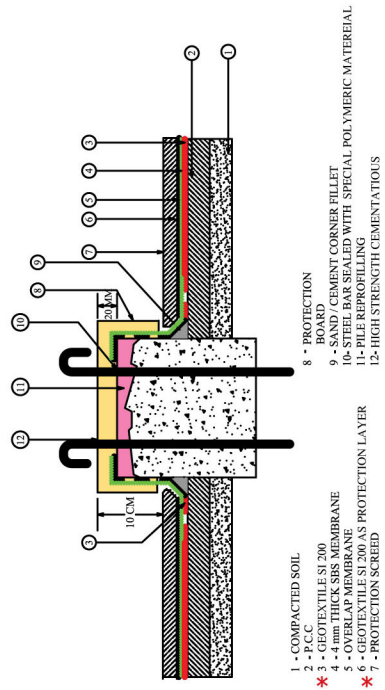
TYPICAL ROOF DRAIN CROSS SECTION DETAIL



TYPICAL CROSS SECTION FOR: BASEMENT



TYPICAL CROSS SECTION FOR: PILE HEAD WATER PROOFING





SALAND INDUSTRIES

Material Division

TECHNICAL DATA OF GEOTEXTILE PRODUCT RANGE

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TECHNICAL DATA OF NONWOVEN GEOTEXTILES

PET/ GEOTEXTILE, NEEDLEPUNCHED

Test Items	Units	Test Method	SI -100	SI -110	SI -120	SI -140	SI -180	SI -200	SI -300	SI -400	SI -500	SI -600	SI -800	SI -1000	SI -1200
Physical															
Basis Weight	g/m ²	EN ISO 9864	100	110	120	140	180	200	300	400	500	600	800	1000	1200
Thickness	mm	EN ISO 9863-1	1.4	1.5	1.6	1.8	2.0	2.3	3.2	3.7	4.5	5.0	6.5	8.0	9.0
Mechanical															
Tensile Strength MD Strip	kN/m	EN ISO 10319	5	6	7	8	10	13	20	25	30	36	38	50	55
Tensile Strength CD Strip	kN/m	EN ISO 10319	5	6	7	8	10	13	20	25	30	36	44	75	85
Elongation MD	%	EN ISO 10319	70	70	70	70	70	70	70	70	70	80	80	80	80
Elongation CD	%	EN ISO 10319	70	70	70	70	70	70	70	70	70	80	80	80	80
Puncture Resistance CBR	N	EN ISO 12236	900	1200	1200	1500	1900	2200	3300	4200	5300	6400	8200	10000	11000
Puncture Resistance cone drop	mm	EN ISO 13433	31	30	30	28	25	22	13	9	5	4	1	1	0
Hydrolysis															
Pore size O90%	microns	EN ISO 12956	105	100	100	100	80	75	70	70	68	68	65	65	60
Water Flow Normal to plane 100mm WH	l/m ² /s	EN ISO 11058	150	150	150	145	110	100	95	85	75	50	45	40	25
Water Flow Normal to plane 50mm WH	l/m ² /s	EN ISO 11058	90	87	85	85	65	60	55	50	45	29	27	25	15

Other Grades of SI Geotextile products, ranges from (80 gms to 2200 g /sq m) are available upon request.



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