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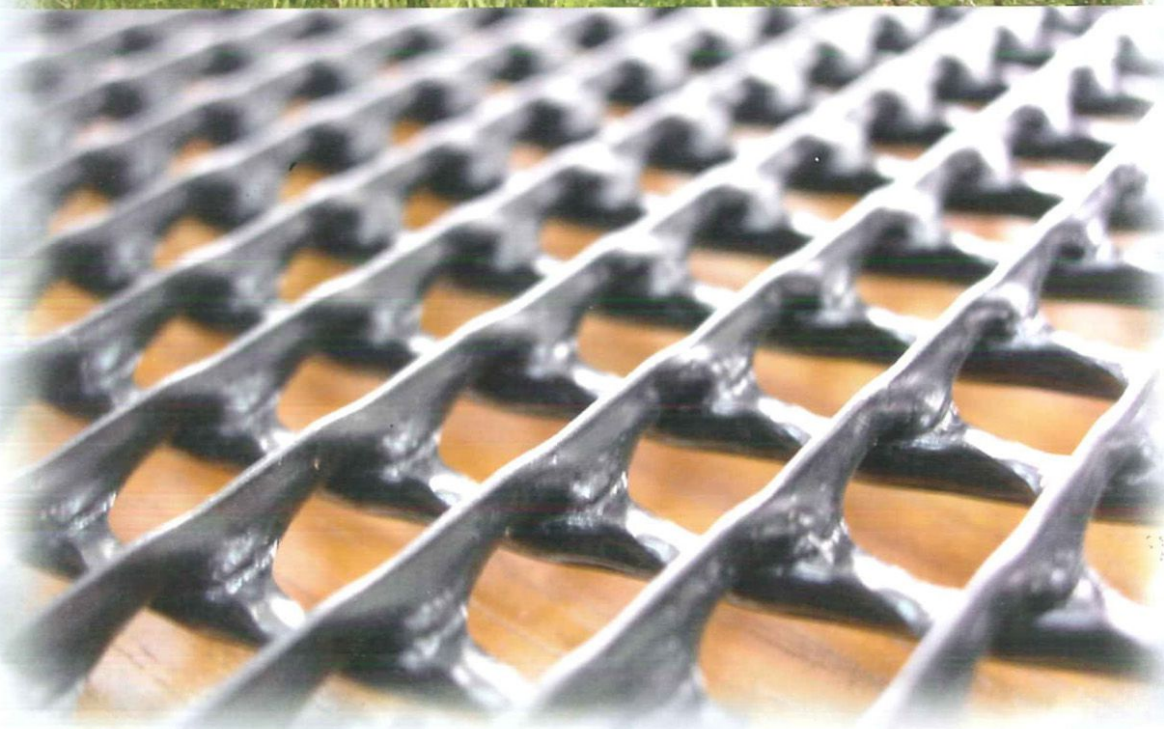
Nexus Geonet

Drainage Applications



Nexus Geonet

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Nexus geonets are high profile nets made from High Density Polyethylene (HDPE) by an extrusion process (Fig. 1).

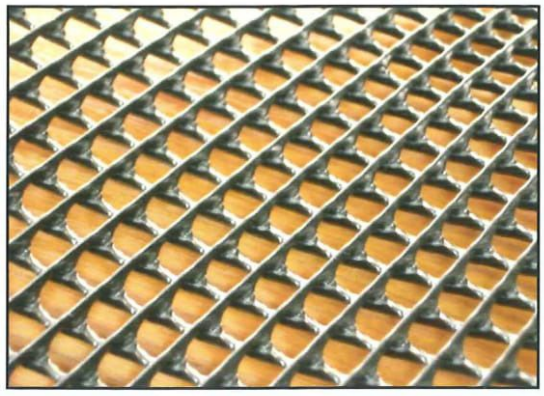

Fig 1-Nexus geonet

The high profile filaments function as flow channels with high discharge capacity for effective drainage. Nexus geonets have high compressive strengths and are suitable for use in areas where they are subjected to high overburden pressure.

Nexus geonets are normally used in conjunction with a geotextile laminated either on one side or on both sides depending on the application to form a drainage geocomposite. The geotextiles can be laminated to the geonets either by heat bonding (Fig.2) or mechanical bonding using cable ties or staples (Fig.3).

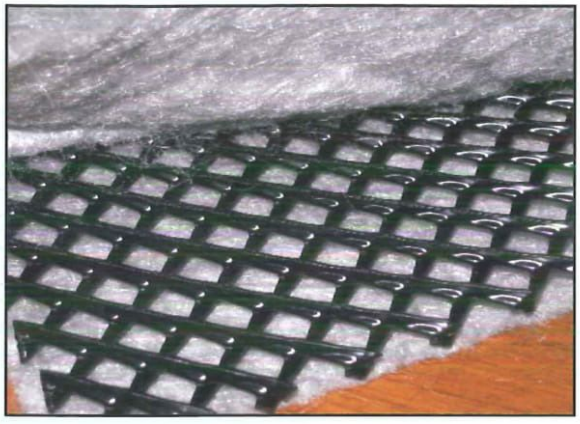

Fig 2-Heat bonding

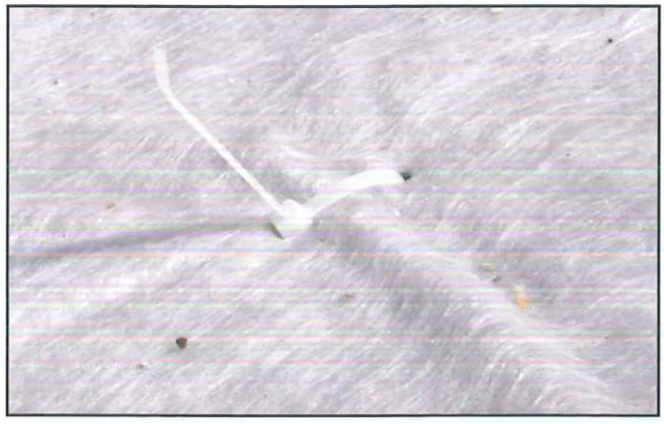

Fig 3-Mechanical bonding

Nexus geonet/geotextiles composite directly replaces the conventional sand/aggregates drainage layers as they are more economical and easy to install. They are widely used in the following applications :

1. Landfill leachate collection/detection systems and landfill cover drainage system.
2. Retaining walls.
3. Reinforced soil slopes (RSS) and Mechanically stabilise earth walls (MSEW).
4. Underground tunnels.
5. Road drainage.
6. Sports fields and golf courses.
7. Rooftop garden.

Nexus Geonet in Landfills

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Nexus geonets have been extensively used in landfill applications. (Fig.6 and Fig.7)
In landfills it is used as a drainage layer in:

1. Leachate collection and removal system (Fig.4).
2. Leachate detection system (Fig.4).
3. landfill cover and gas removal system (Fig.5)

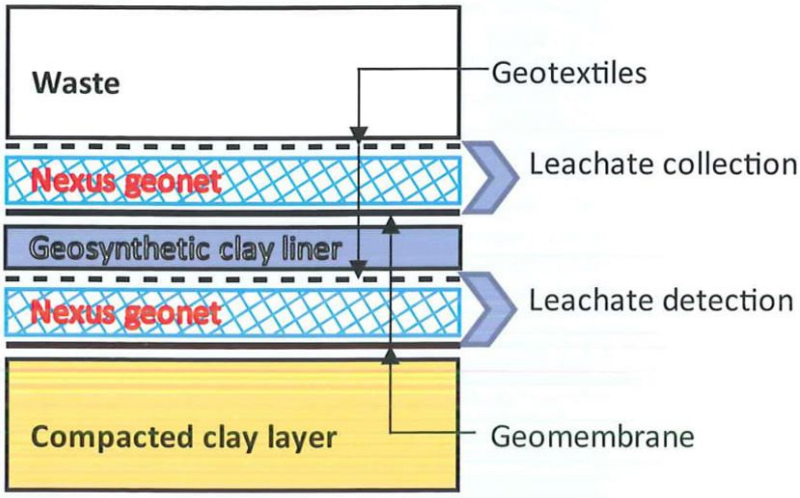

Fig 4-Typical leachate collection and removal system

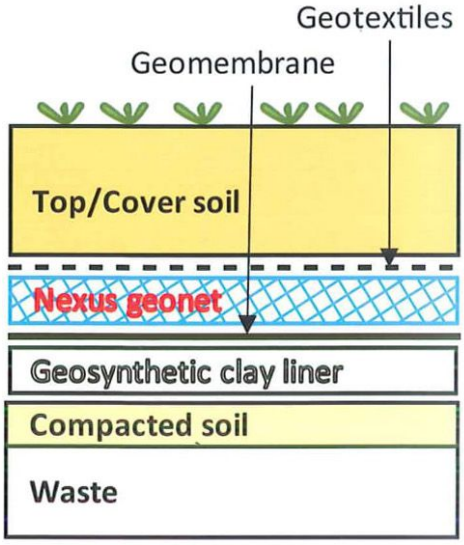

Fig 5- Typical landfill cover

Fig 6-Nexus geonet in landfill construction

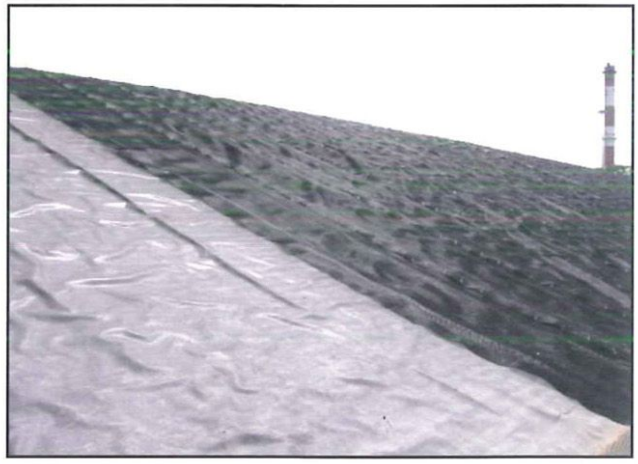

Fig 7-Nexus geonet in landfill cover

Nexus geonet as a drainage layer has many distinct advantages over the conventional sand/aggregate drainage layers in that :

1. it is easy to install. The geonet/ geotextiles composite is simply unrolled on to the prepared surface. No heavy machinery is involved. Hence saving construction time.
2. the geonet/geotextile composite does not clog. It maintains its high flow capacity over the designed life of the landfill.
3. the geonet is made from HDPE and has a high compressive strength. Hence it will perform well under high overburden pressure in landfill applications.
4. the geonet is thin and occupies very minimal space. This results in the landfill having more volume and capacity for the solid waste.
5. it is more economical.

Nexus Geonet in RSS and MSEW

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Construction of traditional sand/aggregates drainage blanket behind Reinforced Soil Slope (RSS) and Mechanically Stabilised Earth Walls (MSEW) are both difficult and time consuming often requiring the construction of temporary formwork. This can easily be replaced with Nexus geonet/geotextiles composite (Fig.8). Installation of Nexus geonet/geotextiles composite is easy, speedy and more economical (Fig.9-12).

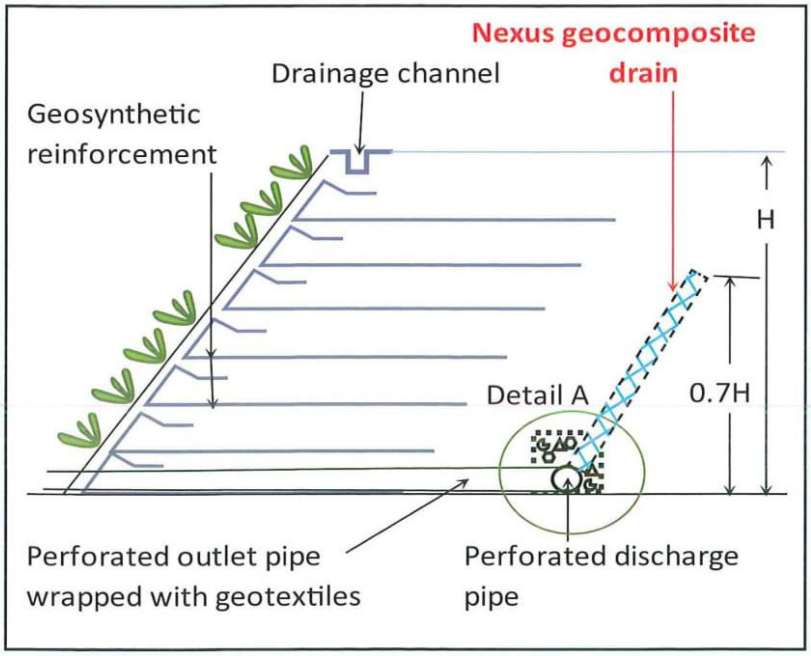
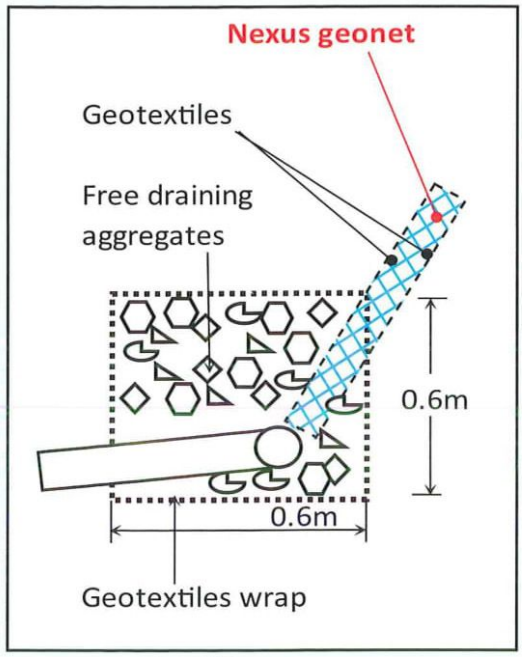


Fig 8 - Nexus geocomposite drain in RSS



Detail A

Nexus geocomposite drains are normally constructed to a height of 0.7 H or to the maximum level of ground water, H being the height of the slope. The spacing of the geocomposite drains is dictated by the topography and permeability of the soil.

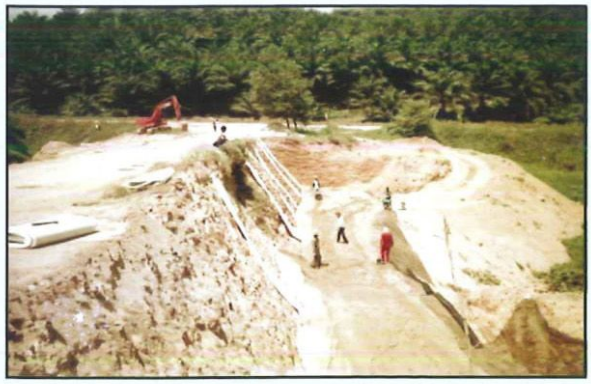


Fig 9 - Nexus geocomposite drain in RSS

Fig 10 - Securing geocomposite drain

Fig 11 - Wrap nexus geonet with geotextiles

Fig 12 - Stapling the geocomposite

Nexus Geonet in Retaining Walls

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In the construction of a reinforced concrete retaining wall, a sand/aggregate drainage blanket is normally installed behind the retaining wall. Such traditional installation would require the erection of formwork rendering the whole construction process tedious, laborious and expensive.

Only two men are required to install Nexus geocomposite drain behind the retaining wall without the use of heavy machineries (Fig.13). The geonet/geotextile composite is unrolled on site, cut to required length and nailed on to the retaining wall. Backfilling operation can then commence.

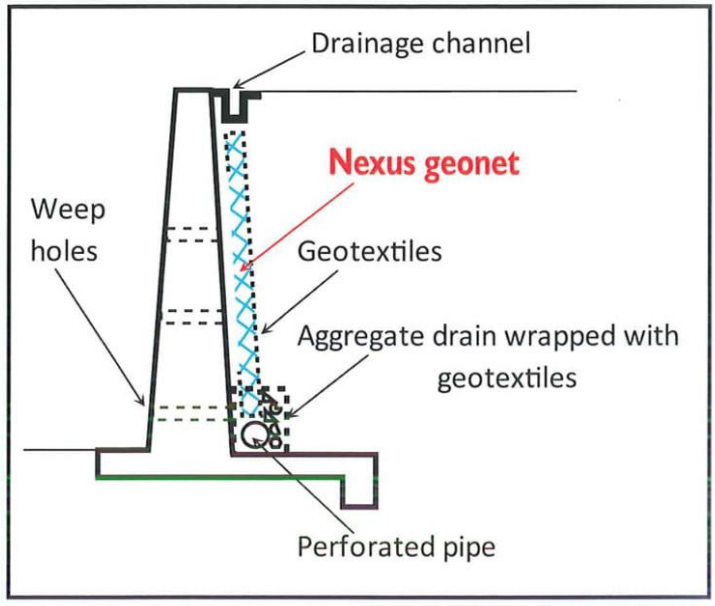


Fig 13 - Nexus geocomposite drain behind RC wall

Nexus geocomposite drains are highly effective for drainage of water behind retaining walls. It has many advantages over the traditional sand/aggregate drainage blanket in that it is lightweight, easy to install, saves time, does not clog, maintain flow rate at high overburden pressure and meet flow rate requirement for most soils.

Installation Method

1. Cut Nexus geonet to required length.
2. Cut geotextiles to size allowing 100mm extra all round (Fig.14).
3. Nail top ends of Nexus geonet/geotextiles to the back of the retaining wall (Fig.15).
4. Adjacent rolls are laid side by side. Staple geotextiles at the joints (Fig.16).
5. Construct aggregate drain with perforated pipe (Fig.17).
6. Commence backfilling.

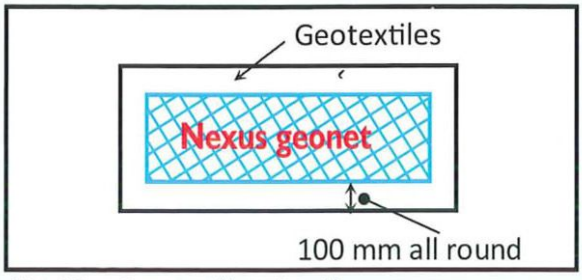


Fig 14 - Geotextiles details

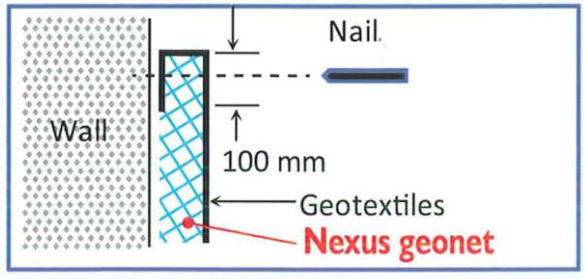


Fig 15 - Top end details

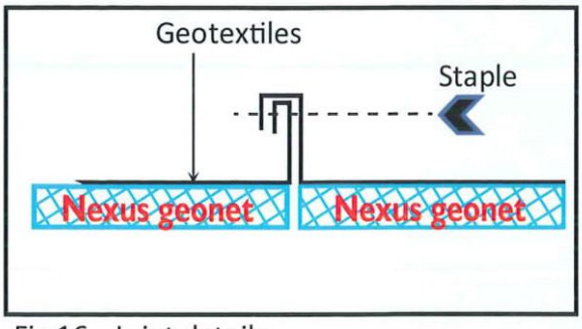


Fig 16 - Joint details

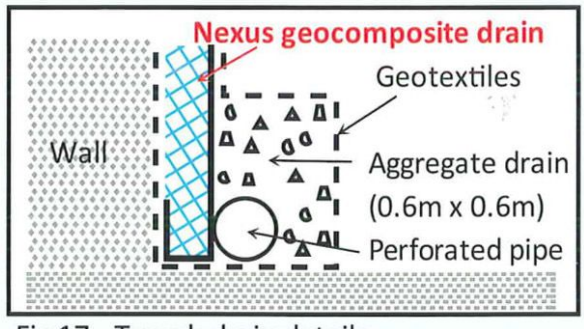
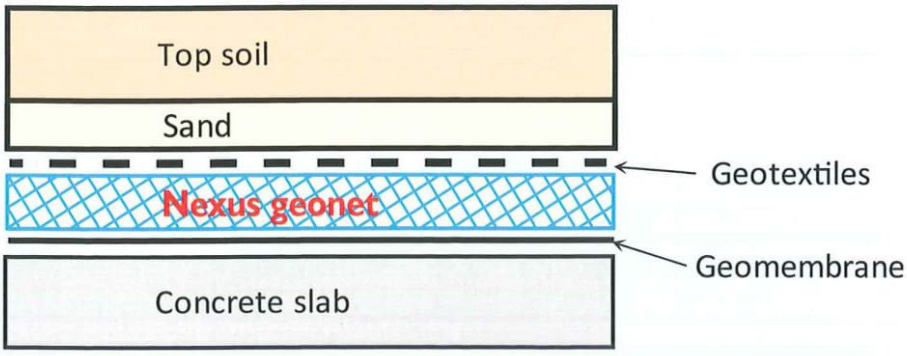


Fig 17 - Trench drain details

Nexus Geonet in Rooftop Gardens

Many buildings nowadays are constructed with rooftop gardens. Traditionally, an aggregate drainage layer is used to drain off excess water. Transportation of aggregates to the rooftop is both expensive and time consuming. Also, the aggregates layer adds weight to the building further adding cost to the roof slab construction.



Nexus geocomposite drain can directly replace the aggregates layer. It is widely used in this application due to its simplicity in construction and speedy installation. A typical rooftop garden construction is as shown in Fig.18.

Fig 18 - Rooftop garden construction

Nexus geocomposite drain are effective as drainage layer in planter boxes and gardens built on concrete deck (Fig.19 and Fig.20). They are also widely used as drainage layer below artificial turf (Fig.21).

Fig 19 - Concrete deck drainage

Fig 20 - Concrete floor drainage

Fig. 21 - Artificial turf drainage

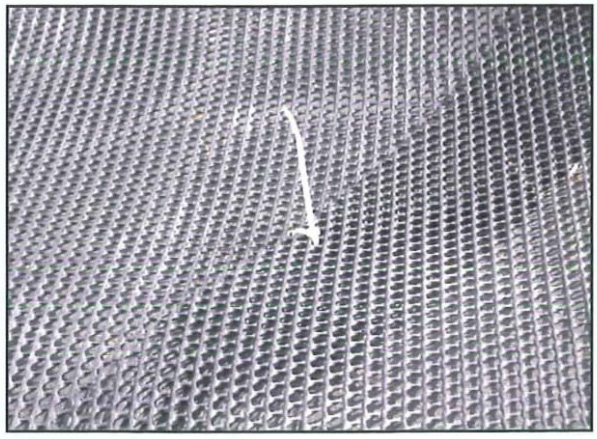


Fig 22 - Secure by plastic cable ties

Installation Method

1. Install geomembrane according to manufacturer's instructions and specifications.
2. Unroll Nexus geonet and overlaps adjacent rolls by 100mm.
3. Secure the overlaps by means of plastic cable ties (Fig.22).
4. Lay geotextiles and overlaps adjacent rolls by 100mm.
5. Staple the overlaps.
6. Commence backfilling of sand and top soil layer.

Nexus Geonet in Road Pavements, Golf courses and Tunnel drainage

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Nexus geocomposite drains have been extensively used in the following areas:

1.Pavement Edge drains

Water ingress into the pavement structure either from the pavement surface or road shoulders can cause extensive damage to the pavement and greatly reduces its useful lifespan. The water can be effectively drained by installation of longitudinal edge drains. They are also known as fin drains in this application. Fin drains can be constructed using Nexus geonet and geotextiles (Fig.23).

2. Golf courses and Sports fields

Waterlogged golf courses and sports fields can be drained by installation of Nexus fin drain (Fig.24).

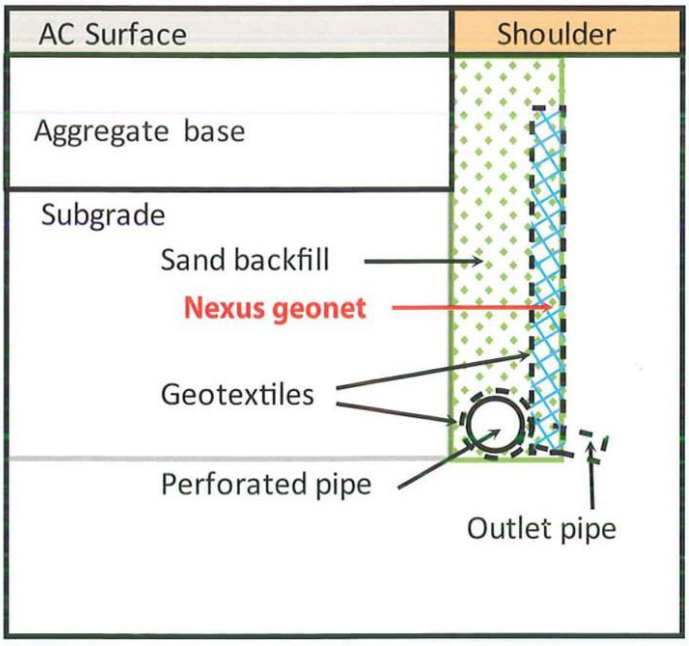

Fig 23 - Pavement fin drain

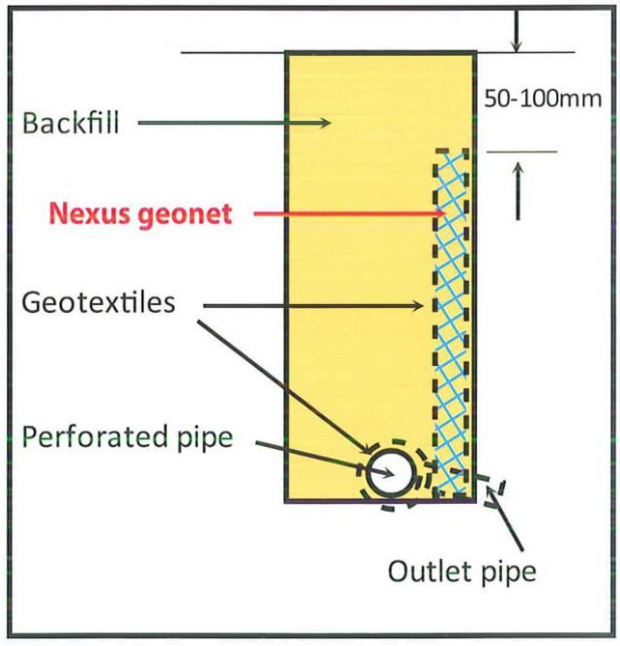

Fig 24 - Golf course fin drain

3. Tunnels

Nexus geocomposite drains can be easily installed in tunnel construction to drain away water seeping into the structures (Fig.25).

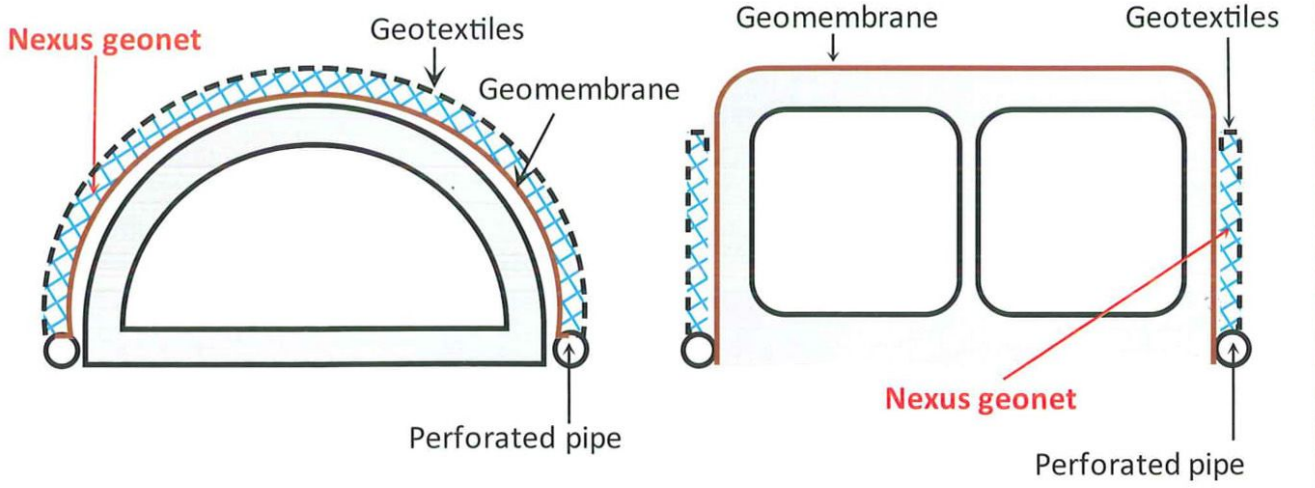

Fig 25 - Nexus geocomposite drain in underground tunnel construction

Specification Data for Nexus Geonets

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PROPERTIES		UNIT	TEST METHOD	DN 500	DN 700	DN 950	TG 600
Polymer				HDPE	HDPE	HDPE	HDPE
Mesh Aperture		mm		11 x 11	10 x 10	9 x 9	9 x 9
Thickness @ 2 kPa		mm	ASTM D6364	4.0	5.0	6.0	5.0
Weight		g/m^2		500	700	950	950
Tensile strength	MD	kN/m	ISO 10319	4.0	7.0	8.5	12.3
	TD	kN/m		3.5	5.5	8.5	6.3
Strain	MD	%		27.0	19.0	21.0	32.0
	TD	%		37.0	41.0	39.0	98.0
Compressive strength		kPa	ASTM D6364	425	961	1375	1371
Strain		%		10.8	13.1	18.1	25.0
Transmissivity, θ	Pressure (kPa)						
Hydraulic gradient, i = 1	20	($m^3/s/m$)	ISO 12958 - 1999	1.39×10^{-3}	1.69×10^{-3}	2.33×10^{-3}	1.63×10^{-3}
	50			1.30×10^{-3}	1.64×10^{-3}	2.29×10^{-3}	1.49×10^{-3}
	100			1.19×10^{-3}	1.56×10^{-3}	2.26×10^{-3}	1.37×10^{-3}
	200			0.81×10^{-3}	1.44×10^{-3}	2.15×10^{-3}	1.30×10^{-3}
	500			0.06×10^{-3}	0.95×10^{-3}	1.74×10^{-3}	*1.21×10^{-3} (*At 400kPa)

UV Stability

Nexus DN and TG geonets are UV stabilised by addition of 2.0% finely divided carbon black. It is designed to withstand prolonged exposure to sunlight under tropical conditions.

Chemical and Biological Resistance

Nexus geonets are not affected by chemicals, acid and alkalis in the range pH 2 to pH 9, normally found in soils. They are also not affected by soil micro-organisms.

The above are average values and are correct to the best of our knowledge. It may subject to change from time to time. We shall not be liable for the interpretation of the above data.

Manufactured by:
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