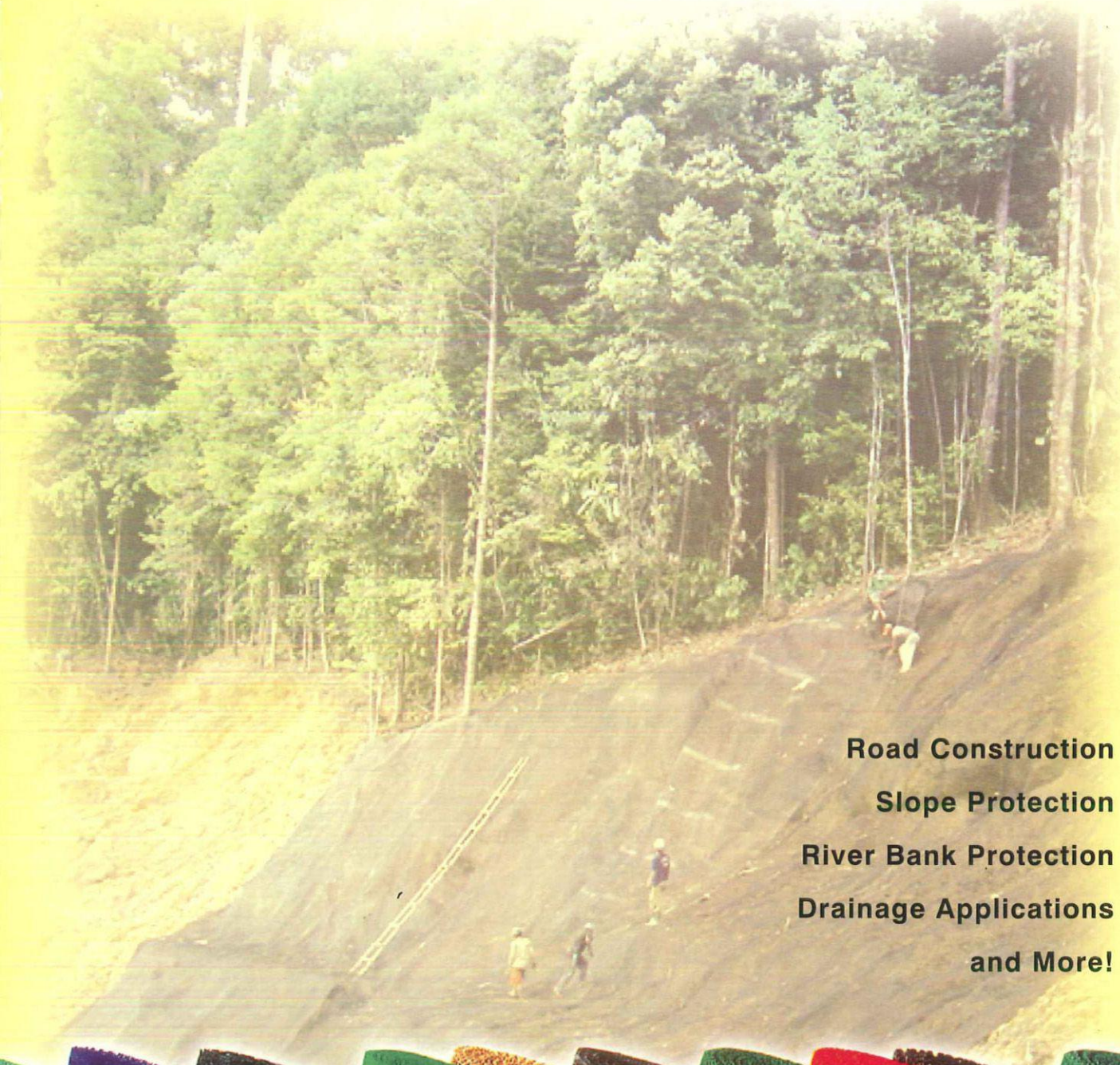
nexus®

POLYMER GRIDS & MESH



Road Construction

Slope Protection

River Bank Protection

Drainage Applications

and More!

1. GEOGRIDS FOR ROAD CONSTRUCTION

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Road Construction

The loss of sub-base material into a soft sub-grade affects the load bearing capacity of the road with resultant deterioration and ultimate failure.

Nexus geogrid laid at the sub-base / sub-grade interface prevents the penetration of sub-base material into the sub-grade. The stone aggregates lock into the grid apertures forming a mechanical interlock that allows a high degree of compaction to be achieved producing a high density shear resistant layer for effective distribution of traffic loads.

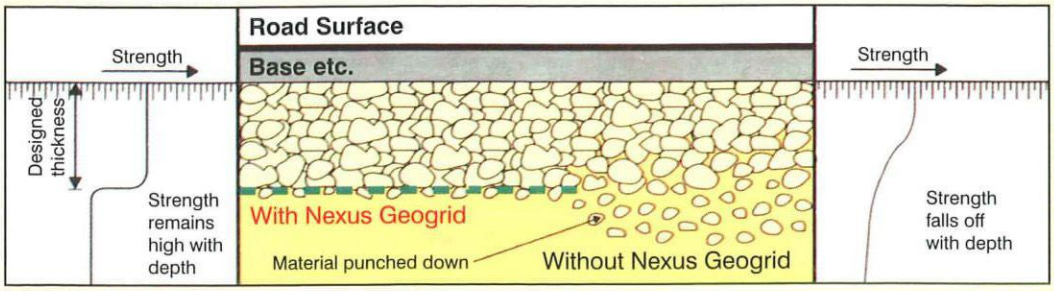

Fig. 1.1 Strength variation with depth

Fig. 1.2 Nexus Geogrid in Road Construction

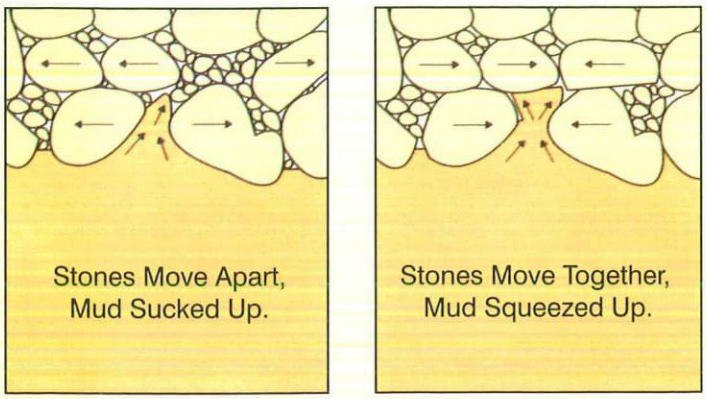

Fig. 1.3 Pumping Action

Pumping Phenomenon

As the road is subjected to dynamic deformation, granular particles in the lowest layers of the sub-base are oscilated laterally causing a pumping action. If these particles are in intimate contact with fine cohesive soil and in the presence of water, the fine soil particles are pumped upwards to fill the voids in the sub-base thus reducing its strengh.

The progressive movement of the subsoil into the voids is shown in Fig 1.3 Nexus geogrids interlock with sub-based particles restraining lateral movement of the stones in the lowest layer of the sub-base thus resisting this pumping action.

Railway Construction

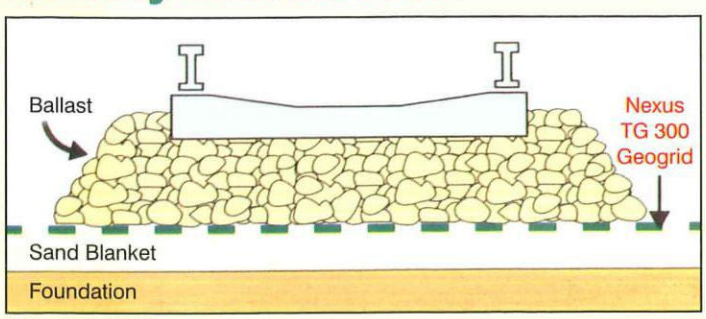

Fig. 1.4 Railway

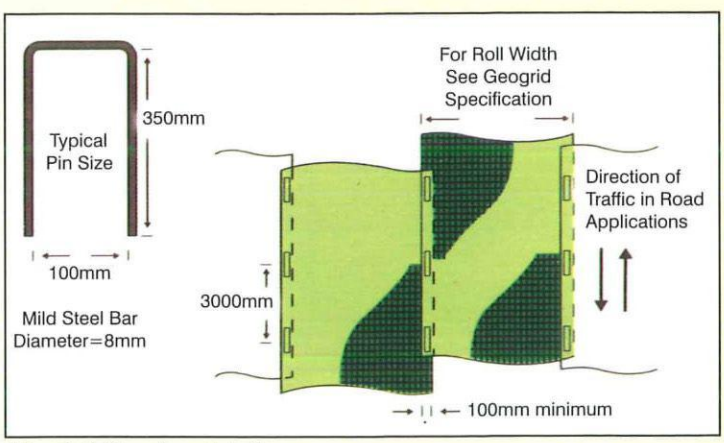

Fig. 1.5 Overlap details

Under repetitive tie loading condition, railway ballast undergoes non-reversible vertical deformation, settlement due to puncture of ballast, abrasion, densification, contamination, degradation and lateral spreading under the ties. Geogrids have demonstrated their ability world wide to cost effectively reinforce and interlock ballast in numerous applications. It acts in the interface as a separator anchor sheet and reduces permanent deformation substantially.

Installation Method

1. *Sub-grade is excavated to its desired level.*
2. *The Nexus grids are rolled out over the sub-grade usually in the direction of travel.*
3. *Adjacent rolls can be overlapped, sewn or pinned together using U shaped pins.*
4. *Granular aggregate is back tipped onto the grids, and using light equipment is spread to a depth slighty greater than desired.*
5. *Compact to desired thickness.*
6. *Minimum overlap with pin or sewn is 0.1 meter.*
7. *Minimum overlap without pin or sewn is 0.3 meter.*

2. GEOGRIDS FOR SLOPE PROTECTION

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Turf Reinforcement Net TR1

Erosion of earth slope in banks and cuttings by wind and rain creates problems leading to instability and consequent failure.

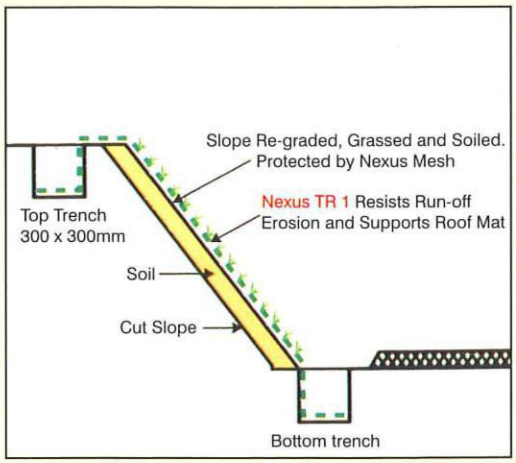


Fig. 2.1 Slope Protection

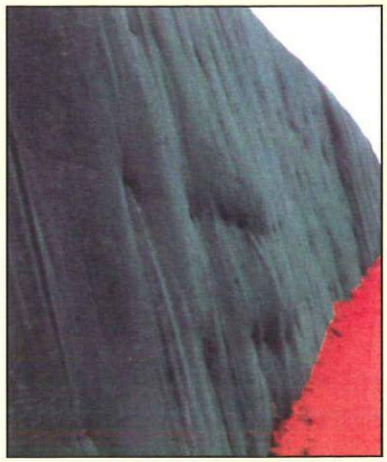


Fig. 2.2 Nexus in Slope Protection

Nexus TR 1 serves three basic functions:

i. it provides shades for the newly planted grass and helps to establish its root system in the slope.
ii. it effectively anchors the turf in place and precludes the 'wash-down' of turf during heavy downpour.
iii. it softens the impact of the rain and directs the run-off along the high profile net structure.

Fig. 2.3 Erosion Mat for Slope Protection

Erosion Mat

For sites where turf can't stand up to high velocity flow and where rip-rap and concrete paving is unacceptable or overkill, Nexus has an alternative - a multi-layered polyethylene netting that reinforces the turf of grassed waterways and slopes against washout. Nexus Erosion Mat is effectively used on:

i) the shores of lakes and reservoirs
ii) the banks and beds of rivers and ditches
iii) the slopes of dykes, road embankments and cuttings.

Nexus Erosion Mat is a robust, high tensile strength, three dimensional structure with outstanding drape qualities which enables it to conform to and maintain intimate contact with the soil profile. With the erosion mat completely filled with soil, and with the an established grass root system, a tenacious and permanent erosion resistant cover is provided to slope, banks and bunds.

Installation Method

1. *Prepare the slope to be treated by trimming to the required profile.*
2. *Place 50-75mm of top soil on the prepared slope (This is optional depending on the soil type and uniformity of the prepared slope).Soil supplements such as fertilizer, lime, soil moisturisers, organic amendments, etc., may be added and incorporated into the soil as required.*
3. *Unroll the erosion mat flat side against the ground. Adjacent rolls are overlapped by a minimum of 100mm.*
4. *Mat should lay flat. DO NOT PULL MAT TAUT over ground. Pulling taut may cause mat to bridge depressions in the surface and allow erosion underneath.*
5. *Fixing using J-shape mild steel pins are recommended for anchoring mat to the ground surface. (Figure.2.4)*
6. *Extend the mat 600-900mm beyond the crest of slopes and anchor the mat using a terminal end trench.*
7. *Bury the top and bottom end of each roll at the shoulder and toe respectively in shallow trenches typically 250mm wide by 450mm deep.*
8. *Sow selected grass seed into the mat followed by a friable soil which is brushed into the full depth of the mat.*
9. *Re-sow the slope with selected seed and apply fertilizer (optional)*
10. *Lightly tamp the soil surface.*

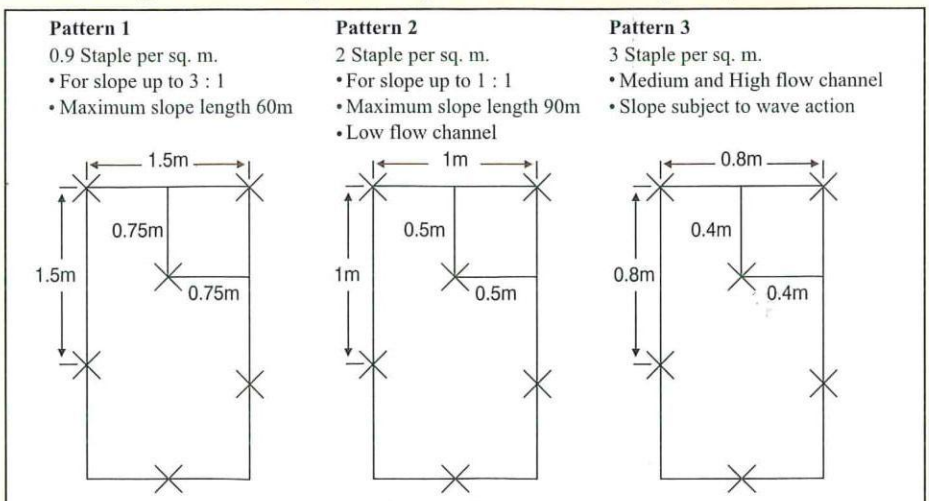


Fig. 2.4 Staple Pattern

River Bank Protection

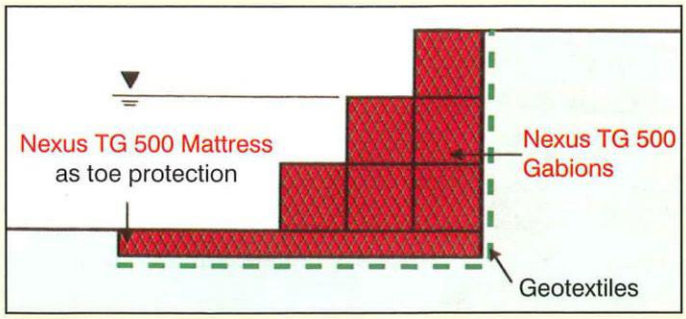


Fig. 3.1 River Bank

Characteristics:

- Resistant to all naturally occurring soil acids and alkalis ranging from pH 2 to pH 9.
- Complete corrosion resistance.
- Flexibility to allow differential settlement.
- Lightweight and easy to handle on site.
- Supplied in collapsed form for speedy assembly on site.
- UV Stabilised.
- Available in rectangular, square and tubular forms.

Channel and River Bank Lining

Nexus mattresses affords an effective method of controlling bank erosion for rivers and canals. The eroded bank must be prepared i.e. regraded or backfilled if necessary before the mattresses are installed.

When the bank slope is steeper than 2:1, the mattress should be effectively anchored by means of a stake at the top end of the mattress.

Water Velocity (m/s)	Mattress Thickness (m)
1.8	0.17
3.6	0.23
4.5	0.33
5.0	0.5

For a 2H : 1V slope, the recommended mattress thickness are as shown in the table above.

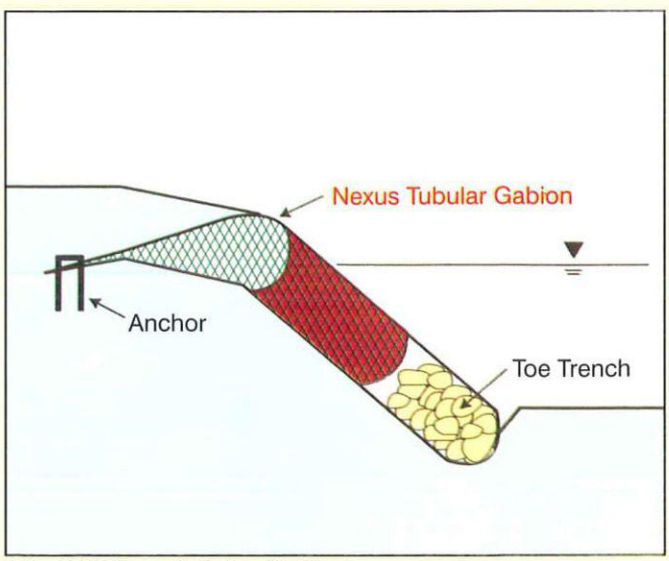


Fig. 3.3 Nexus Tubular Gabions

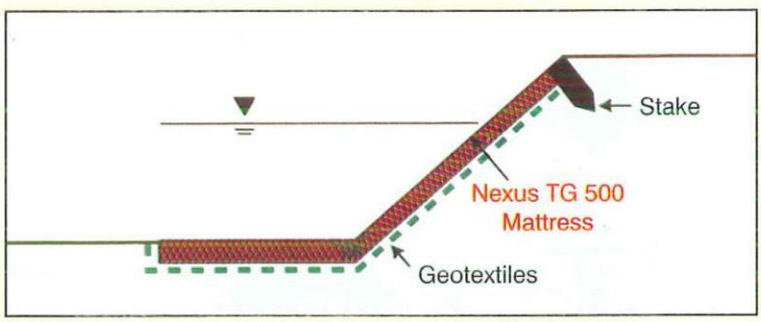
Advantages:

Nexus gabions and mattresses with their simplicity of construction, inbuilt permeability and flexibility characteristics, offer a wide range of applications ranging from gravity earth retaining wall to river and coastal protection. Being of high strength polymer and its inherent chemicals inertness, it is ideal for ground engineering applications.

Fig. 3.2 Nexus Gabions in River Bank Protection

Nexus Gabions Sizes:

- 1m x 1m x 0.5m
- 1m x 1m x 1m
- 2m x 1m x 0.5m
- 2m x 1m x 1m
- 3m x 1m x 0.5m
- 3m x 1m x 1m
- 4m x 1m x 0.5m
- 4m 1m x 1m



Nexus Mattresses Sizes

- 3m x 2m x 0.17m
- 3m x 2m x 0.23m
- 3m x 2m x 0.33m
- 6m x 1m x 0.33m
- 6m x 2m x 0.17m
- 6m x 2m x 0.23m
- 6m x 2m x 0.33m

Tubular Gabions

In cases of deep waterways where it is not practical to install gabions or mattresses underwater, tubular gabions are recommended as a revertment for erosion control. A tubular gabion revertment comprises a battery of stone filled polymer grid tubes, forming a flexible armouring to the bank of a waterway.

The empty tubular gabion is laid on the bank slope and stones are fed through a hopper positioned at the top end of the gabion until it is completely filled. The top end is then closed by means of polyethylene braid and anchored firmly to the shoulder.

Alternatively, the tubular gabions can be filled with soil and seeded for vegetation growth.

Tubular gabions are supplied in layflat form with different mesh sizes to suit particular engineering requirements.

4. GABIONS/MATTRESS ASSEMBLY INSTRUCTIONS

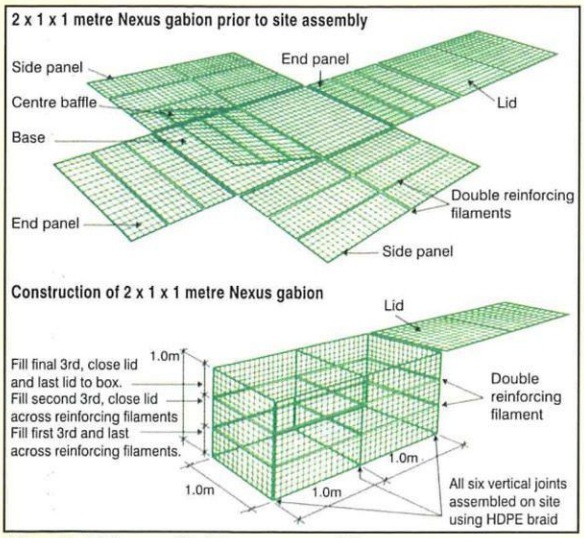


Fig. 3.4 Nexus Gabions assembly

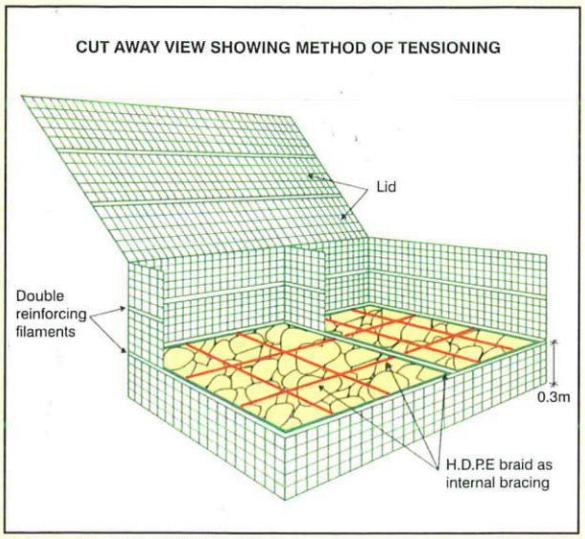


Fig. 3.5 Internal Bracing

Site Assembly

Nexus gabions/mattresses are delivered in layflat form. Stretch out gabions/ mattresses on flat surface. Raise one side through to 90 degrees and one end to 90 degrees. Tie the vertical joint firmly with H.D.P.E.(high density polyethylene) braid and repeat the process with internal baffles (if any) and the end panel (Fig. 3.4)

All lacing using H.D.P.E.braid must be done as a continuous operation and it is essential that knots must be tied at every 60mm intervals (or at every squares).

Filling

Carry the assembled gabion / mattress to its final position and fasten securely to the adjacent ones. It is advisable to fasten the gabions / mattresses together when both are empty. A timber frame should be used to encase the gabion before stone laying operation to prevent bulging of the gabions.

The fill materials should be placed in the compartments by hand or machinery. The fill used should be hard well graded durable stones not less than 75mm in size. Stone sizes of 75 to 200mm is recommended.

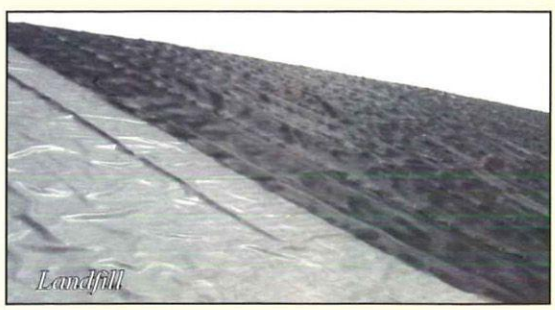
For marine work the minimum stone size should be 150mm.

When the gabion is filled up to the level of the double filament i.e. 0.33m, the gabion should be tensioned (Fig. 3.5) using H.D.P.E. braid as internal bracing. Continue stone filling operation until next level of double filament is reached i.e. 0.66m where the procedure of tensioning using H.D.P.E. braid should be repeated. In cases where 0.5m gabions are used, internal bracings should be done at half full.

5. GEONET

Nexus drainage nets are high profile nets that provide flow channels for effective drainage. Nexus drainage nets when used in conjunction with geotextiles are used behind retaining walls and landfill system.

They are lightweight and easy to install. It represents a better alternative to the conventional aggregate / sand drain system.



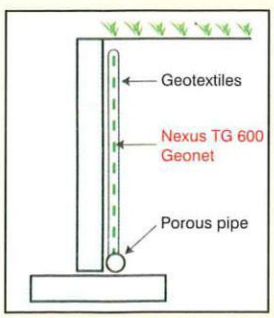


Fig. 4.1 Nexus Geonet behind retaining wall

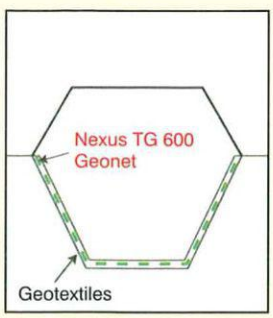


Fig. 4.2 Nexus Geonet used in landfill construction

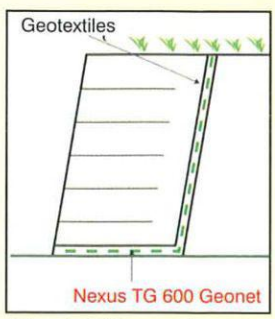


Fig. 4.3 Nexus Geonet in reinforced soil slope

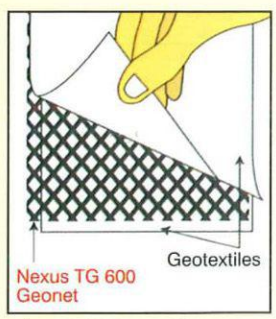
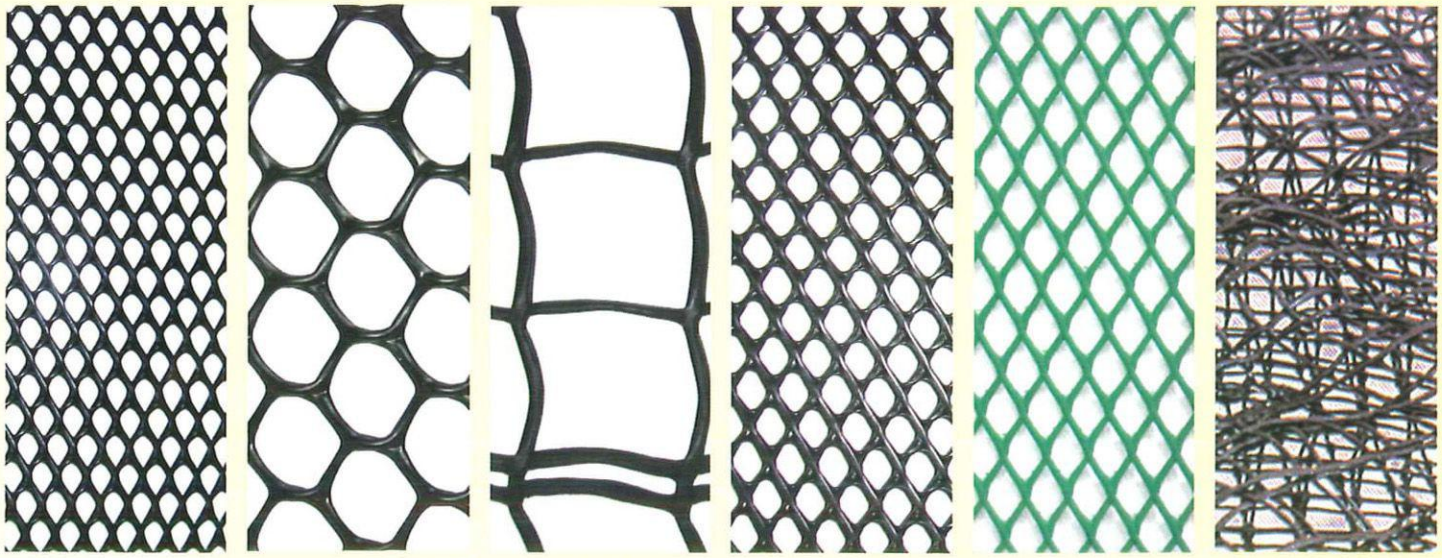


Fig. 4.4 Nexus Geonet with geotextiles

Specification Data For Civil Engineering Products

nexus®

TG 200 | TG 300 | TG 500 | TG 600 | TR-1 | Erosion Mat



Specification data	TG 200	TG 300	TG 500	TG 600	TR-1	Erosion Mat
Form	Sheet	Sheet	Gabions Mattress	Sheet	Sheet	Sheet
Dimensions Width	2m	2m	1m layflat	2m	1.25m	1.5m
Length	25m	25m	varies	25m	25m	30m
Mesh aperture size	8 x 6mm	27 x 27mm	60 x 60mm	8 x 8mm	7 x 10mm	
Mesh thickness	3.3mm	5.2mm	5.9mm	5.0mm	2.0mm	15.0mm
Structural weight	730 g/m²	660 g/m²	700 g/m²	950 g/m²	400 g/m²	350 g/m²
Colour	Black	Black	Black	Black	Green	Black
Polymer	HD polyethylene	HD polyethylene	HD polyethylene	LD or HD polyethylene	HD polyethylene	LD polyethylene
Mechanical properties Tensile strength Max load kN/m	7.68	5.80	6.15	12.67	4.50	2.60
Extension at max load	20.2 %	16.5 %	23.2 %	32 %	24.0 %	27.0 %

*Test Method : **ISO 10319***

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.

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