

WHAT GEOTEXTILE TO USE WHERE : GUIDANCE NOTES

**EXTRACTS FROM : TRANSIT NEW ZEALAND SPECIFICATION TNZ F/7 2003 GEOTEXTILES NOTES,
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www.nzta.govt.nz/resources/geotextiles/docs/geotextiles-notes.pdf**

TNZ F/7 NOTES: 2003 : NOTES TO THE SPECIFICATION FOR GEOTEXTILES

These notes are for the guidance of Transit New Zealand's staff and consultants, and must not be included in the contract documents.

1. SCOPE

These notes accompany the TNZ F/7 Specification: Geotextiles.

They apply to geotextiles for use in filtration and/or separation functions on state highways.

2. APPLICATION CATEGORIES

Where selection of the geotextile has not been by site specific design, the strength and filtration classes shall comply with Table 1 below.

TABLE 1 GEOTEXTILE FILTRATION CLASS APPLICATION CATEGORIES		
APPLICATION	MATERIAL REQUIREMENT	FILTRATION CLASS See Table 5
<p>G1: Separation under/within Embankments (Unsaturated Ground)</p> <p>Primarily to prevent mixing of dissimilar soil types where the soils will not become saturated and any filtration is not critical. (Not to be associated with seepage areas or areas requiring drainage blankets). Applicable for subgrade soils CBR \geq 3.</p>	A type conforming to the geotextile class strength requirements in Table 2 of these Notes for the specific site, subgrade and nominal maximum stone particle size (D_{85}) of the fill	Class 4
<p>G2: Combined Filtration and Separation under/within Embankments including Drainage Blanket Applications</p> <p>To provide coincident functions of separation and filtration, or for drainage blanket applications. Applicable for subgrade soils CBR $>$ 1.</p>	A type, other than a slit film woven type, conforming to geotextile strength requirements in Table 2 of these Notes applying site subgrade site conditions with CBR \leq 3 and nominal maximum stone particle size of (D_{85}) of the fill.	Class 2
<p>G3: Trench Drains and Highway Edge Drains</p>	A type, other than a slit film woven type, conforming to the geotextile strength class requirements of Table 3 of these Notes for the nominal maximum stone size of fill (D_{85}) and specific trench depth.	Class 1
<p>G4: Drainage and Separation behind Retaining Structures including Rock Filled Mattresses</p> <p>To provide the combined functions of separation and filtration</p>	A type, other than a slit film woven type, conforming to the geotextile strength class requirements of Table 4 of these Notes for the particular wall type	Class 1
<p>G5: Under Rock Armour Revetment Layer in Embankments</p> <p>Note: An aggregate layer with a nominal maximum stone size of less than 75mm shall be used where the maximum drop height of the rock armour exceeds 1.5 metres and should be considered as the initial layer prior to the placement of larger revetment rock armour to protect the geotextile.</p>	A type, other than a slit film woven type, which shall meet the geotextile strength requirements for Class D or E requirements in Table 6 of these Notes for a nominal revetment stone size (D_{85}) of 200mm and 400mm respectively.	Class 3

TABLE 2 SELECTION OF GEOTEXTILE CLASS FOR MECHANICAL SEPARATION OF SOIL LAYERS INCLUDING DRAINAGE BLANKETS		
	GEOTEXTILE STRENGTH CLASS (Table 6)	
NOMINAL MAX. STONE PARTICLE SIZE D_{85} (mm) (note a)	Subgrade $1 \leq \text{CBR} \leq 3$ (notes d,e)	Subgrade $\text{CBR} > 3$
≤ 37.5	C	A
≤ 75	C	B
≤ 200	D	C
≤ 400	E (note b)	D
≤ 600	Not applicable (note c)	E

TABLE 3 SELECTION OF GEOTEXTILE STRTENGTH CLASS FOR TRENCH DRAIN APPLICATIONS		
	GEOTEXTILE STRENGTH CLASS (Table 6)	
NOMINAL MAX. STONE PARTICLE SIZE D_{85} (mm) (note a)	Trench depth $< 2\text{m}$	Trench depth $< 3\text{m}$
≤ 37.5	A	B
≤ 75	B	C
≤ 200	C	D

TABLE 4 : SELECTION OF GEOTEXTILE STRENGTH CLASS FOR DRAINAGE & SEPARATION BEHIND RETAINING STRUCTURES INCLUDING ROCK FILLED MATTRESSES	
TYPE OF STRUCTURE	GEOTEXTILE STRENGTH CLASS (Table 6)
Conventional concrete retaining walls Segmental block walls Reinforced soil concrete panel walls	B
Gabion walls Crib walls Rock filled mattresses	C

Notes Accompanying Tables 2 to 4:

- (a) Nominal maximum stone size of fill.
 (b) Not applicable for geotextiles with elongation $< 30\%$ (refer to Note a) of Table 6.
 (c) Not applicable for this case. Specific design is required. As an alternative a fill with a maximum nominal stone size less than 75mm should be considered for the initial lift to protect the geotextile.
 (d) Specific design is required for separation over subgrades with $\text{CBR} < 1$.
 (e) Specific design may support the specification of strength classes other than those given by Tables 2-4. Specific design should consider factors in addition to those included in Tables 2-4; a number of the references appended to these Notes provide guidance. However, the strength classes listed for each item in Tables 2-4 shall be considered the minimum allowed.

10. JOINTING

Sewing of seams is permitted. As the geotextiles are for use in filtration and/or separation applications, the seam types specified are medium strength but have the advantage of not using the selvage as a stitching surface.

Polyester thread of at least to 300

Tex should be used for sewing of seams. Standard polyester thread of 300 Tex and of 350 Tex, and field machines for two line lock stitching are available in New Zealand.

Where joints are not sewn, they can be overlapped. The minimum overlap is usually 300mm, but in poor ground conditions the required width of overlap increases.

The Table below provides a guideline for minimum overlap required.

CBR	MINIMUM OVERLAP
> 3	300 - 450 mm
1 - 3	0.6 - 1 m
0.5-1	1 m or sewn
< 0.5	sewn
All roll ends	1m or sewn

Where high settlements are expected (eg embankments over peat), the overlap should be increased.