

1174 DRAINAGE MATS

1 GENERAL**1.1 RESPONSIBILITIES****Objectives**

General: Provide drainage mats, filter materials and pipes as shown on the drawings, as documented.

Performance

Requirements: Conform with this specification, the Drawings and as directed by the Superintendent.

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0136 General requirements (Construction).
- 0152 Schedule of rates – supply projects.
- 0161 Quality (Construction).
- 0167 Integrated management.
- 1101 Control of traffic.
- 1171 Subsurface drainage.
- 1173 Pavement drains.

1.3 REFERENCED DOCUMENTS**Standards**

General: The following documents are incorporated into this worksection by reference:

AS 1289	Methods of testing soils for engineering purposes.
AS 1289.5.6.1-1998	Soil compaction and density tests - Compaction control test - Density index method for a cohesionless material

1.4 INTERPRETATION**Definitions**

General: For the purposes of this worksection the following definitions apply:

- Type A mats: Mats intended to ensure continuity of a sheet flow of water under fills, to collect surface seepage from a wet seepage area or for protection of vegetation or habitat downstream of the road reserve where a fill would otherwise cut the flow of water.
- Type B mats: Mats constructed to intercept water which would otherwise enter pavements by capillary action or by other means on fills and to intercept and control seepage water and springs in the floors of cuttings.

1.5 SUBMISSIONS**Approval**

Submissions: To the Superintendent's approval.

Components

General: Geotextiles and pipes to 1171 Subsurface drainage.

Materials

General: Refer materials clauses for items to 1171 Subsurface drainage.

1.6 HOLD POINTS AND WITNESS POINTS**Notice**

General: Give notice so that the documented inspection and submissions may be made to the **HOLD POINT table** and the **WITNESS POINT table**.

HOLD POINTS table

Item/Clause title	Requirement	Notice for inspection	Release by
Type A mats / Type B mats			
Geotextile, Damaged geotextile	Approval of condition or repair of geotextile	1 working day before next activity	<i>Principal Certifying Authority</i>
Filter material, Thickness	Approval of thickness and layers of filter material	3 working days before placing filters	<i>Principal Certifying Authority</i>

WITNESS POINTS table

Item	Requirement	Notice for inspection
Type A mats /Type B mats		
Filter material, Protective layer	Inspection of placement of protective layer over mat extension.	3 working days before placing materials
Discharge, Outlets	Inspection of outlet proposals	7 days before set-out of layers

2 PRE-CONSTRUCTION PLANNING**2.1 SCHEDULING****Programming the works**

Program: To conform with embankment and pavement construction as follows:

- Type A mats: After the site has been cleared and grubbed and before commencement of embankment construction.
- Type B mats: After completion of the subgrade construction and before construction of the pavement.

3 MATERIALS**3.1 FILTER MATERIAL****Mat components**

General: Conform to the following:

- Type A mats: Type B, C or D filter material to *1171 Subsurface drainage*.
- Type B mats: Type A or D filter material to *1171 Subsurface drainage*.

3.2 GEOTEXTILE**General**

Geotextile: To *1171 Subsurface drainage*.

3.3 PVC PRESSURE PIPE**General**

Thick walled unplasticised PVC pressure pipe: To *1171 Subsurface drainage*.

4 EXECUTION**4.1 PROVISION FOR TRAFFIC****General**

Control of traffic: Conform to the following:

- Conform with worksection *1101 Control of traffic*.
- Conform with **Traffic Guidance Scheme** in *1101 Control of traffic*.

4.2 TYPE A MATS

Placement

Location: Conform to the following:

- Under embankments as shown on the drawings or as directed by the Superintendent.
- Extending 2 m beyond the toes of embankments.

Geotextile

General: Provide geotextile as follows:

- On the embankment foundation after the embankment foundation has been trimmed and any necessary trench drains installed.
- On top of and around the sides of the filter material after placement and compaction of the filter material to cover and enclose the sides of the drainage mat and filter material.

Geotextile under rock facing: Place an additional layer of geotextile on the drainage mat under the base of rock facing forming part of the embankment construction. Extend the additional layer of geotextile beyond the outside and inside faces of the bottom layer of rock.

Lap width: 500 mm minimum at each join in the geotextile.

Protection of geotextile: Secure the geotextile to prevent movement by wind or by construction plant placing subsequent layers of filter material or earth filling over the drainage mat. Protect from damage during construction of the drainage mat and during placement of subsequent layers of filter material, earth filling or rock facing.

Damaged geotextile: Replace or repair damaged geotextile. This is a **HOLD POINT**.

Filter material

Type: Type B, C or D as shown on the drawings or as determined by the Superintendent.

Location: Compacted on the geotextile.

Thickness: Conform to the following: This is a **HOLD POINT**.

- Known expected consolidation of embankment: 300 mm minimum plus allowance for the expected total consolidation of the embankment.
- Unknown expected total consolidation of the embankment foundation: 500 mm minimum.
- Layers: Provide filter material in two or more layers so that the thickness of a compacted layer is 250 mm maximum.

Protective layer: Cover the extension of the mat beyond the toe of the embankment with 300 mm filter material immediately after completion of construction of each drainage mat. This is a **WITNESS POINT**.

Discharge

Outlets: May be either of the following: This is a **WITNESS POINT**.

- Surface outlets at the toes of embankments.
- Piped outlets connected to other drainage systems conforming to 1171 *Subsurface drainage*.

4.3 TYPE B MATS

Placement

Location: In cuttings as shown on the drawings or as directed by the Superintendent.

Width: The full width of cuttings and for the pavement width in other locations.

Geotextile

General: Provide geotextile as follows:

- On the subgrade after the subgrade material has been compacted and trimmed.
- On top of and around the sides of the filter material so that the filter material is completely enclosed after completion of placement and compaction of the filter material.

Lap width: 500 mm minimum at each join in the geotextile.

Protection of geotextile: Conform to the following:

- General: Secure the geotextile to prevent movement by wind or by construction plant placing subsequent layers of filter material or earth filling over the drainage mat. Protect from damage

during construction of the drainage mat and during placement of subsequent layers of filter material, earth filling or rock facing.

- Damaged geotextile: Replace or repair damaged geotextile. This is a **HOLD POINT**.

UPVC pressure pipe: Lay thick walled unplasticised PVC pressure pipe on the geotextile at a distance of 200 mm from and parallel to the longitudinal edges of the drainage blanket as shown in the drawings.

Filter material

Type: Type A or D as shown on the drawings and as determined by the Superintendent.
Compaction: Compact cohesionless material to a Density Index of 70% determined by AS 1289.5.6.1.

Thickness: Conform to the following:

- As shown on the drawings or as directed by the Superintendent. This is a **HOLD POINT**.
- Layers: Provide filter material in layers so that the thickness of a compacted layer is 250 mm maximum. This is a **WITNESS POINT**.

Discharge

Outlets: To *1171 Subsurface drainage*. This is a **WITNESS POINT**.

Tolerance

Surface level: At the design level for the top of the drainage mat with a tolerance of + 0 and - 40 mm.

4.4 LIMITS AND TOLERANCES

Application

Summary: The limits and tolerances applicable to this worksection are summarised in

Summary of limits and tolerances table.

Summary of limits and tolerances table

Activity	Limits/Tolerances	Clause/ subclause
Filter material		
Layer thickness	250 mm max	Type A mats & Type B mats
Compaction (Relative) Type A filter material	100% (Standard compaction)	Type B mats
Type B mats		
Design level at top of mat	+ 0, - 40 mm	Type B mats

5 MEASUREMENT AND PAYMENT

5.1 MEASUREMENT

General

Payment made to the schedule of rates: To *0152 Schedule of rates – supply projects*, this worksection, the drawings and Pay items 1171.1 to 1171.5 inclusive.

Lump Sum prices: Not acceptable.

Unpriced items: For each unpriced item listed in the Schedule of Rates, make due allowance in the prices of other items.

Methodology

The following methodology will be applied for measurement and payment:

- Filter material and outlet structures are measured and paid to conform with *1171 Subsurface drainage*.
- Thick walled unplasticised PVC pressure pipe is measured and paid to conform with this worksection and not *1173 Pavement drains* or *1171 Subsurface drainage*.

5.2 PAY ITEMS

Pay items	Unit of measurement	Schedule rate scope
1174.1 Supply and placement of geotextile	m ² of area covered	All costs associated with: <ul style="list-style-type: none"> -Area covered by geotextile measured on site, excluding additional geotextile used in lap joints. -For Type A drainage mats, the additional layer of geotextile placed under rock facing. -All costs associated with supply, placing and securing of the geotextile material. -The schedule quantity is a provisional quantity.
1174.2 Drainage mat outlet pipe	- The linear metre of pipe laid Actual length laid will be measured along the centreline of the pipe including pipe leading to outlet structures.	All costs associated with: <ul style="list-style-type: none"> -All costs associated with the supply and laying of the pipe. -The schedule quantity is a provisional quantity.