

COFFS HARBOUR CITY COUNCIL



**DEVELOPMENT SPECIFICATION
DESIGN**

1174 Drainage mats

Version 1 01 January 2009

1174 DRAINAGE MATS**1 SCOPE AND GENERAL****1.1 SCOPE**

The work to be executed under this worksection covers the installation of Drainage Mats (Blankets). This worksection should be read in conjunction with 1171 *Subsurface drainage*.

1.2 QUALITY

Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are given in 0161 *Quality (Construction)*.

1.3 REFERENCED DOCUMENTS

The following documents referred to in this worksection shall be deemed as the latest edition of the Australian Standards, including amendments and supplements.

Worksections

0161 *Quality (Construction)*

1171 *Subsurface drainage*

1173 *Pavement drains*

Standards

AS 1289 Methods of testing soils for engineering purposes

AS 1289.5.4.1 Soil compaction and density tests—Compaction control test—Dry density ratio, moisture variation and moisture ratio

1.4 TERMINOLOGY**Type A mats**

Type A drainage mats are 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

Type B drainage mats are 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 ORDER OF CONSTRUCTION**Type A mats**

Type A drainage mats shall be constructed after the site has been cleared and grubbed and before commencement of embankment construction.

Type B mats

Type B drainage mats shall be constructed after completion of the subgrade construction and before construction of the pavement.

1.6 LOCATION

Drainage mats shall be constructed where and as shown on the Drawings or as directed by the Superintendent.

2 CONSTRUCTION

2.1 TYPE A MATS

Location

Type A drainage mats shall be constructed under embankments as and where shown on the Drawings or as directed by the Superintendent.

Placing of geotextile

After the embankment foundation has been trimmed and any necessary trench drains installed, a geotextile complying with 1171 *Subsurface drainage* shall be laid on the embankment foundation.

The area of geotextile laid shall be sufficient to cover the area of the Type A drainage mat and an additional amount for enclosing the sides of the drainage mat after the filter material has been placed.

Laps of minimum width of 500 mm shall be provided at each join in the geotextile.

Placing of filter material

Type C filter material or Type D filter material, as shown on the Drawings or as determined by the Superintendent, shall be placed on the geotextile and compacted to the satisfaction of the Superintendent.

The minimum thickness of the compacted filter material shall be 300 mm plus an allowance for the expected consolidation of the embankment foundation under the embankment load or 500 mm if the amount of the expected total consolidation of the embankment foundation is not known.

The filter material shall be placed in two or more layers so that no layer, when compacted, has a thickness greater than 250 mm.

Enclosing filter material and securing of geotextile

After completion of placement and compaction of the filter material, geotextile shall be placed on top of and around the sides of the filter material so that the filter material is completely enclosed by geotextile.

The geotextile shall be secured in such a manner as to prevent movement of the geotextile by wind or by construction plant placing subsequent layers of filter material or earth filling over the drainage mat.

Geotextile under rock facing

An additional layer of geotextile shall be placed on the drainage mat under the base of any rock facing which may be placed as part of the embankment construction.

The additional layer of geotextile shall extend beyond the outside and inside faces of the bottom layer of rock.

Damaged geotextile

Care shall be taken not to damage the geotextile during the construction of the drainage mat or during placement of subsequent layers of filter material, earth filling or rock facing. Any geotextile so damaged shall be repaired or replaced by the Contractor to the satisfaction of the Superintendent.

The cost of repairing or replacing such damaged geotextile shall be borne by the Contractor.

Protective layer

Type A drainage mats shall extend 2 m beyond the toes of embankments and such extensions shall be covered by a 300 mm thick layer of Type C or Type D filter material, as determined by the Superintendent. This protective layer shall be placed immediately after completion of construction of each drainage mat.

Outlets

Outlets from Type A drainage mats may be surface outlets at the toes of embankments or piped outlets connected to other drainage systems. Where piped outlets are constructed they shall conform to 1171 *Subsurface drainage*.

2.2 TYPE B MATS

Location and width

Type B drainage mats shall be constructed in cuttings as and where shown on the Drawings or as directed by the Superintendent.

Type B drainage mats shall be constructed for the full width of cuttings and for the pavement width in other locations.

Placing of geotextile

After the subgrade material has been compacted and trimmed, a geotextile complying with 1171 *Subsurface drainage* shall be laid on the subgrade.

Laps of minimum width of 500 mm shall be provided at each join in the geotextile.

UPVC pressure pipe

Thick walled unplasticised PVC pressure Pipe, complying with 1171 *Subsurface drainage* shall be laid 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.

Placing of filter material

Type A filter material shall be placed on the geotextile and compacted to achieve a relative compaction, determined by AS 1289.5.4.1, of at least 100% (Standard compaction).

Alternatively, the Superintendent may approve the use of a coarser Type D filter material having a maximum particle size of 75 mm and a maximum D90/D10 ratio of three.

Thickness of filter material

The thickness of the compacted filter material shall be as shown on the Drawings or as directed by the Superintendent.

If the required thickness of compacted filter material is greater than 250 mm, the filter material shall be placed in two or more layers so that no layer, when compacted, has a thickness greater than 250 mm.

Enclosing filter material and securing geotextile

After completion of placement and compaction of the filter material, geotextile shall be placed on top of and around the sides of the filter material so that the filter material is completely enclosed by geotextile.

The geotextile shall be secured in such a manner as to prevent movement of the geotextile by wind or by construction plant placing pavement layers over the drainage mat.

Damaged geotextile

Care shall be taken not to damage the geotextile during the construction of the drainage mat or during placement of subsequent pavement layers.

Any geotextile so damaged shall be repaired or replaced by the Contractor to the satisfaction of the Superintendent.

The cost of repairing or replacing such damaged geotextile shall be borne by the Contractor.

Surface level tolerance

The surface of the completed drainage mat shall be at the design level for the top of the drainage mat with a tolerance of plus zero and minus 40 mm.

Outlet structures where specified, or where directed by the Superintendent, shall be in accordance with 1171 *Subsurface drainage*.

3 LIMITS AND TOLERANCES

The limits and tolerances applicable to this worksection are summarised in Table 3.1.

Table 3.1 Summary of limits and tolerances

Activity	Limits/Tolerances	Worksection reference
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

4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

Payment shall be made for all the activities associated with completing the work detailed in this worksection on a schedule of rates basis in accordance with Pay Items 1174.1 and 1174.2.

A lump sum price for any of these activities shall not be accepted.

If any item, for which a quantity of work is listed in the Schedule of Rates has not been priced by the Contractor, it shall be understood that due allowance has been made in the prices of other items for the cost of the activity which has not been priced.

Filter material and outlet structures are measured and paid in accordance with 1171 *Subsurface drainage*.

Thick walled unplasticised PVC pressure pipe is measured and paid in accordance with this worksection and not 1173 *Pavement drains* or 1171 *Subsurface drainage*.

4.2 PAY ITEMS

1174.1 Supply and placement of geotextile

The unit of measurement shall be the square metre of area covered by geotextile as measured on site.

No additional payment shall be made for additional geotextile used in lap joints.

For Type A drainage mats, the additional layer of geotextile placed under rock facing shall be measured and included as an additional quantity for payment under this item.

The schedule rate shall cover the supply, placing and securing of the geotextile material.

The schedule quantity is a provisional quantity.

1174.2 Drainage mat outlet pipe

The unit of measurement shall be the linear metre of pipe laid.

The distance shall be measured along the centreline of the pipe and shall be the actual length laid including pipe leading to outlet structures.

The schedule rate shall cover the supply and laying of the pipe.

The schedule quantity is a provisional quantity.