

QPRC



**QUEANBEYAN PALERANG
REGIONAL COUNCIL**

**DEVELOPMENT
CONSTRUCTION
SPECIFICATION**

C233

DRAINAGE MATS

VERSION 2 – JUNE 2018

TRIM REF: SF140543
C1874502

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
VERSION 1	Specification Version 1 - South Jerrabomberra reference, inspection requirements added	C.233.01	A	KD	24/04/15
	Specification Version 1 - South Jerrabomberra reference, standards updated	C233.03	M		
	Specification Version 1 - South Jerrabomberra reference, Hold Points added	C233.05	A		
	Specification Version 1 - South Jerrabomberra reference, Hold Points added	C233.06	A		
	Specification Version 1 - South Jerrabomberra reference	C223.09	A		
	Annexure added	C233-A	A		
VERSION 2	References to QPRC updated	Various	M	EE	4/06/18

SPECIFICATION C233 - DRAINAGE MATS – VERSION 2

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SPECIFICATION C233 : DRAINAGE MATS – VERSION 2

GENERAL

C233.01 SCOPE

1. The work to be executed under this Specification covers the installation of Drainage Mats (Blankets). **Scope**
2. Drainage mats shall be constructed where and as shown on the Drawings or as directed by the Superintendent. **Location**
3. This Specification should be read in conjunction with the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2. **Associated Specification**
4. Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification Part for Quality Requirements. **Quality**
5. The Contractor shall give notice so that inspection may be made of all **HOLD POINTS** and **WITNESS POINTS** documented in this specification and tabulated in Annexure C233-A. Release of **HOLD POINTS** and **WITNESS POINTS** shall be made by the Superintendent, with the concurrence of the Principal Certifying Authority, where stipulated in Annexure C233-A. **Inspections**

C233.02 TERMINOLOGY

1. 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 A Mats**
2. 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. **Type B Mats**

C233.03 REFERENCE DOCUMENTS

1. Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated. **Documents Standards Test Methods**
- (a) **Council Specifications**
- | | | |
|------|---|---|
| C230 | - | Subsurface Drainage – General - Version 2 |
| C232 | - | Pavement Drains - Version 2 |
- (b) **Australian Standards**
- | | | |
|--------------------|---|---|
| AS 1289 | | Methods of testing soils for engineering purposes |
| AS 1289.5.4.1 | - | Compaction control test - Dry density ratio, moisture variation and moisture ratio. |
| AS 1289.5.5.1:1998 | | Soil compaction and density tests – Determination of the minimum and maximum dry density of a cohesionless material – Standard method |

(c) Other Publications

- AGPT10/09-2009 Guide to pavement technology Part 10 - Subsurface drainage
- AGRD05/08-2008 Guide to road design Part 5 - Drainage design

C233.04 ORDER OF CONSTRUCTION

- 1. Type A drainage mats shall be constructed after the site has been cleared and grubbed and before commencement of embankment construction. **Type A Mats**
- 2. Type B drainage mats shall be constructed after completion of the subgrade construction and before construction of the pavement. **Type B Mats**

CONSTRUCTION

C233.05 TYPE A MATS

- 1. Type A drainage mats shall be constructed under embankments as and where shown on the Drawings or as directed by the Superintendent. **Location**
- 2. After the embankment foundation has been trimmed and any necessary trench drains installed, a geotextile complying with the requirement of the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2, 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 500mm shall be provided at each join in the geotextile. This is a **HOLD POINT**. **Placing of Geotextile (HP)**
- 3. 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 300mm plus an allowance for the expected consolidation of the embankment foundation under the embankment load or 500mm 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 250mm. This is a **HOLD POINT**. **Placing of Filter Material (HP)**
- 4. 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. **Securing of Geotextile**
- 5. 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. **Geotextile under Rock Facing**
- 6. 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. **Damaged Geotextile Contractor's Cost**

7. Type A drainage mats shall extend 2m beyond the toes of embankments and such extensions shall be covered by a 300mm thick layer of Type C filter material 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. This is a **WITNESS POINT**.

Protective Layer

(WP)

8. 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 the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2.

Outlets

C233.06 TYPE B MATS

1. 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.

Location and Width

2. After the subgrade material has been compacted and trimmed, a geotextile complying with the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2, shall be laid on the subgrade. Laps of minimum width of 500mm shall be provided at each join in the geotextile. This is a **HOLD POINT**.

Placing of Geotextile

(HP)

3. Slotted thick walled unplasticised PVC pressure pipe complying with AS 1477, shall be laid on the geotextile at a distance of 200mm from and parallel to the longitudinal edges of the drainage blanket as shown in the Drawings. Details of slot sizes and spacings are shown in the Specification for PAVEMENT DRAINS – VERSION 2.

UPVC Pressure Pipe

4. 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 per cent (standard compaction). Alternatively, the Superintendent may approve the use of a coarser filter material having a maximum particle size of 75mm and a maximum D90/D10 ratio of three.

Placing of Filter Material

5. 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 250mm, the filter material shall be placed in two or more layers so that no layer, when compacted, has a thickness greater than 250mm. This is a **HOLD POINT**.

Thickness of Filter Material

(HP)

6. 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.

Securing of Geotextile

7. 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. This is a **HOLD POINT**. The cost of repairing or replacing such damaged geotextile shall be borne by the Contractor.

Damaged Geotextile (HP)

Contractor's Cost

8. 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 40mm.

Surface Level Tolerance

9. Outlet structures where specified, or where directed by the Superintendent, shall be in accordance with the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2.

SPECIAL REQUIREMENTS

C233.07 RESERVED

LIMITS AND TOLERANCES

C233.08 SUMMARY OF LIMITS AND TOLERANCES

1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C233.1 below.

Item	Activity	Limits/Tolerances	Spec Clause
1.	Filter Material		
	(a) Layer thickness	250mm max	C233.05 C233.06
	(b) Compaction (Relative) Type A filter material	100% Standard	C233.06
2.	Type B Mats		
	(a) Design level at top of mat	+0, -40mm	C233.06

Table C233.1 - Summary of Limits and Tolerances

MEASUREMENT AND PAYMENT**C233.09 PAY ITEMS**

1. Payment shall be made for all activities associated with completing the work detailed in this Specification in accordance with Pay Items C233(a) and C233(b).
2. A lump sum price for any of these activities shall not be accepted.
3. 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.
4. Filter material and outlet structures are measured and paid in accordance with the Specification for SUBSURFACE DRAINAGE – GENERAL - VERSION 2.
5. Slotted thick walled unplasticised PVC pressure pipe is measured and paid in accordance with this Specification and not in the Specification for PAVEMENT DRAINS - VERSION 2.

Pay Item C233(a) SUPPLY AND PLACEMENT OF GEOTEXTILE

1. The unit of measurement shall be the square metre of area covered by geotextile as measured on site.
2. No additional payment shall be made for additional geotextile used in lap joints.
3. 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.
4. The schedule rate shall cover the supply, placing and securing of the geotextile material.
5. The schedule quantity is a provisional quantity.

Pay Item C233(b) DRAINAGE MAT OUTLET PIPE

1. The unit of measurement shall be the linear metre of pipe laid.
2. The distance shall be measured along the centreline of the pipe and shall be the actual length laid including pipe leading to outlet structures.
3. The schedule rate shall cover the supply and laying of the pipe.
4. The schedule quantity is a provisional quantity.

ANNEXURE C233- A

INSPECTIONS

Give notice so inspection may be made of the following:

Summary of HOLD POINTS

Item/Clause title	Requirement	Notice for inspection	Release by
CONSTRUCTION			
Type A Mats			
C233.05.2 – Placing of Geotextile	Approval of geotextile layer	1 working day before next activity	Superintendent
C233.05.3 – Placing of Filter Material	Approval of thickness and layers of filter material	3 working days before placing filters	Superintendent
Type B Mats			
C233.06.2 – Placing of Geotextile	Approval of geotextile laid	1 working day before next activity	Superintendent
C233.06.5 – Thickness of Filter Material	Approval of thickness and layers of filter material	3 working days before placing filters	Superintendent
C233.06.7 – Damaged Geotextile	Repair or replace damaged geotextile	1 working day before next activity	Superintendent

Summary of WITNESS POINTS

Item	Requirement	Notice for inspection
CONSTRUCTION		
Type A Mats		
C233.05.7 - Protective layer	Inspection of placement of protective layer over mat extension.	3 working days before placing materials