

DEVELOPMENT
CONSTRUCTION
SPECIFICATION

C233

DRAINAGE MATS

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
<i>Original</i>	<i>Northern Rivers - Local Government Version</i>	<i>All</i>	<i>Original Edition</i>	<i>LCC</i>	<i>January 1999</i>
1	Major Revision as per Aus-Spec Bulletin Board Release 10	All	AMO	SPM	April 2003
2	Revisions as per Aus-Spec Bulletin Board releases 11 & 12	All	AMO	SPM	April 2003
3	Density Index of Filter Material	233.06 (4)	M	SPM	March 2004
4	Limits and Tolerances for Filter Materials	233.08	M	SPM	March 2004

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SPECIFICATION C233 : DRAINAGE MATS

GENERAL

C233.01 SCOPE

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| 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 Approved Drawings. | Location |
| 3. This Specification should be read in conjunction with the Specification for SUBSURFACE DRAINAGE - GENERAL. | 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 |

C233.02 TERMINOLOGY

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| 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

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| 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 |
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(a) Council Specifications

- | | | |
|------|---|-------------------------------|
| C230 | - | Subsurface Drainage - General |
| C232 | - | Pavement Drains |

(b) Australian Standards

- | | | |
|---------------|---|--|
| AS 1289.5.4.1 | - | Methods of testing soils for engineering purposes – Soil compaction and density tests - Compaction control test - Dry density ratio, moisture variation and moisture ratio.. |
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C233.04 ORDER OF CONSTRUCTION

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| 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

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| <p>1. Type A drainage mats shall be constructed under embankments as and where shown on the Approved Drawings.</p> | <p><i>Location</i></p> |
| <p>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, 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.</p> | <p><i>Placing of Geotextile</i></p> |
| <p>3. Type C filter material or Type D filter material, as shown on the Approved Drawings, 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.</p> | <p><i>Placing of Filter Material</i></p> |
| <p>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.</p> | <p><i>Securing of Geotextile</i></p> |
| <p>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.</p> | <p><i>Geotextile under Rock Facing</i></p> |
| <p>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.</p> | <p><i>Damaged Geotextile</i></p> <p><i>Contractor's Cost</i></p> |
| <p>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 detailed on the Approved Drawings. This protective layer shall be placed immediately after completion of construction of each drainage mat.</p> | <p><i>Protective Layer</i></p> |
| <p>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.</p> | <p><i>Outlets</i></p> |

C233.06 TYPE B MATS

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| <p>1. Type B drainage mats shall be constructed in cuttings as and where shown on the Approved Drawings. Type B drainage mats shall be constructed for the full width of cuttings and for the pavement width in other locations.</p> | <p><i>Location and Width</i></p> |
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2. After the subgrade material has been compacted and trimmed, a geotextile complying with the requirements of the Specification for SUBSURFACE DRAINAGE - GENERAL, shall be laid on the subgrade. Laps of minimum width of 500mm shall be provided at each join in the geotextile. ***Placing of Geotextile***
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. ***UPVC Pressure Pipe***
4. Type A filter material shall be placed on the geotextile and compacted to achieve a density index, determined by AS 1289.5.4.1, of at least 65 per cent. 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 Approved Drawings or as tabled in this specification. 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. ***Thickness of Filter Material***
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. The cost of repairing or replacing such damaged geotextile shall be borne by the Contractor. ***Damaged Geotextile 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.

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	Tolerances	Spec Clause
1.	Filter Material		
	(a) Layer thickness	250mm max	C233.05 C233.06
	(b) Compaction (Relative) Type A filter material	65% density index	C233.06
2.	Type B Mats		
	(a) Design level at top of mat	+0, -40mm	C233.06

Table C233.1 - Table of Limits and Tolerances