

# CAPRICORN MUNICIPAL DEVELOPMENT GUIDELINES

## DRAINAGE MATS

C233

# CONSTRUCTION SPECIFICATION



---

**TABLE OF CONTENTS**

CLAUSE	CONTENTS	PAGE
<b>GENERAL</b> .....		<b>2</b>
C233.01	SCOPE .....	2
C233.02	REFERENCE DOCUMENTS .....	2
C233.03	TERMINOLOGY .....	3
C233.04	ORDER OF CONSTRUCTION .....	3
<b>CONSTRUCTION</b> .....		<b>3</b>
C233.05	TYPE A MATS .....	3
C233.06	TYPE B MATS .....	4
<b>LIMITS AND TOLERANCES</b> .....		<b>6</b>
C233.07	SUMMARY OF LIMITS AND TOLERANCES .....	6

**Keeping the Capricorn Municipal Development Guidelines up-to-date**

The Capricorn Municipal Development Guidelines are living documents which reflect progress of municipal works in the Capricorn Region. To maintain a high level of currency that reflects the current municipal environment, all guidelines are periodically reviewed with new editions published and the possibility of some editions to be removed. Between the publishing of these editions, amendments may be issued. It is important that readers assure themselves they are using current guideline, which should include any amendments which may have been published since the guideline was printed. A guideline will be deemed current at the date of development approval for construction works.

**GENERAL**

**C233.01 SCOPE**

- |            |   |                                  |
|------------|---|----------------------------------|
| C233.01.01 | The work to be executed under this Specification covers the installation of Drainage Mats (Blankets).   | <b>Scope</b>                     |
| C233.01.02 | Drainage mats shall be constructed where and as shown on the Drawings or as directed by the Certifying Engineer.  | <b>Location</b>                  |
| C233.01.03 | This Specification covers the construction of drainage structures and shall be read in conjunction with the Specification for SUBSURFACE DRAINAGE - GENERAL C230.   | <b>Associated Specifications</b> |
| C233.01.04 | Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification for SUBSURFACE DRAINAGE - GENERAL C230 Annexure.   | <b>Quality</b>                   |
| C233.01.05 | The following order of priority for interpretation of documents will apply:<br>(Please note that reference to a Guideline or Standard, is reference to the latest version of the relevant document, unless specifically a version number is specifically stated)<br><br>(a) CMDG C233 Drainage Mats – Construction Specifications<br><br>(b) AS1289.5.4.1 | <b>Order of Priority</b>         |

**C233.02 REFERENCE DOCUMENTS**

- |            |   |   |
|------------|---|---|
| C233.02.01 | Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.   | <b>Documents<br/>Standards<br/>Test Methods</b> |
|            | <p><b>(a) CMDG Specifications</b></p> <p>C230 - Subsurface Drainage - General<br/>C232 - Pavement Drains</p> <p><b>(b) Australian Standards</b></p> <p>AS1289.5.4.1 - Compaction control test - Dry density ratio, moisture variation and moisture ratio.</p> |   |

**C233.03 TERMINOLOGY**

- C233.03.01 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*
- C233.03.02 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*

**C233.04 ORDER OF CONSTRUCTION**

- C233.04.01 Type A drainage mats shall be constructed after the site has been cleared and grubbed and before commencement of embankment construction. *Type A Mats*
- C233.04.02 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**

- C233.05.01 Type A drainage mats shall be constructed under embankments as and where shown on the Drawings or as directed by the Certifying Engineer. *Location*
- C233.05.02 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 C230, shall be laid on the embankment foundation. *Placing of Geotextile*
- C233.05.03 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.
- C233.05.04 Type C filter material or Type D filter material in accordance with the Specification for SUBSURFACE DRAINAGE - GENERAL C230, as shown on the Drawings or as determined by the Certifying Engineer, shall be placed on the geotextile and compacted to the satisfaction of the Certifying Engineer. 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. *Placing of Filter Material*

## DRAINAGE MATS

---

C233.05.05	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	<b>Securing of Geotextile</b>
C233.05.06	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.	<b>Geotextile under Rock Facing</b>
C233.05.07	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 Certifying Engineer. The cost of repairing or replacing such damaged geotextile shall be borne by the Subdivider.	<b>Damaged Geotextile Subdivider's Cost</b>
C233.05.08	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 in accordance with the Specification for SUBSURFACE DRAINAGE - GENERAL C230, as determined by the Certifying Engineer. This protective layer shall be placed immediately after completion of construction of each drainage mat.	<b>Protective Layer</b>
C233.05.09	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.	<b>Surface Level Tolerance</b>
C233.05.10	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 specified, or where directed by the Certifying Engineer, they shall be in accordance with the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL C230.	<b>Outlets</b>
<b>C233.06</b>	<b>TYPE B MATS</b>	
C233.06.01	Type B drainage mats shall be constructed in cuttings as and where shown on the Drawings or as directed by the Certifying Engineer. Type B drainage mats shall be constructed for the full width of cuttings and for the pavement width in other locations.	<b>Location and Width</b>
C233.06.02	After the subgrade material has been compacted and trimmed, a geotextile complying with the requirements of the Specification for C230 SUBSURFACE DRAINAGE -GENERAL, shall be laid on the subgrade. Laps of minimum width of 500mm shall be provided at each join in the geotextile.	<b>Placing of Geotextile</b>
C233.06.03	Slotted thick walled 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 spacing are shown in the Specification for PAVEMENT DRAINS C232.	<b>PVC Pressure Pipe</b>

C233.06.04	Type A filter material in accordance with the Specification for SUBSURFACE DRAINAGE - GENERAL C230, 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 Certifying Engineer may approve the use of a coarser filter material having a maximum particle size of 75mm and a maximum D90/D10 ratio of three.	<b><i>Placing of Filter Material</i></b>
C233.06.05	The thickness of the compacted filter material shall be as shown on the Drawings or as directed by the Certifying Engineer. 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.	<b><i>Thickness of Filter Material</i></b>
C233.06.06	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.	<b><i>Securing of Geotextile</i></b>
C233.06.07	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 Certifying Engineer. The cost of repairing or replacing such damaged geotextile shall be borne by the Subdivider.	<b><i>Damaged Geotextile</i></b> <b><i>Subdividers Cost</i></b>
C233.06.08	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.	<b><i>Surface Level Tolerance</i></b>
C233.06.09	Outlet structures where specified, or where directed by the Certifying Engineer, shall be in accordance with the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL C230.	

## LIMITS AND TOLERANCES

### C233.07 SUMMARY OF LIMITS AND TOLERANCES

C233.07.01 The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C233. 07.1- Summary of Limits and Tolerances below:

**Table C233. 07.1- Summary of Limits and Tolerances**

<b>Item</b>	<b>Activity</b>	<b>Limits/Tolerances</b>	<b>Spec Clause</b>
1.	<b>Filter Material</b>		
	a) Layer thickness	250mm max	C233.05.04 C233.06.05
	b) Compaction (Relative) Type A filter material	100% Standard	C233.06.04
2.	<b>Type A Mats</b>		
	a) Design level at top of mat	+0, -40mm	C233.05.09
3.	<b>Type B Mats</b>		
	a) Design level at top of mat	+0, -40mm	C233.06.08