

CAPRICORN MUNICIPAL DEVELOPMENT GUIDELINES

PAVEMENT DRAINS

C232

CONSTRUCTION SPECIFICATION

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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

C232.01 SCOPE

1. This Specification covers the installation of Sub-Pavement Drains, and Edge Drains. **Scope**
2. Pavement drains shall be constructed where and as shown on the Drawings. **Location**
3. This Specification should be read in conjunction with the Specification for SUBSURFACE DRAINAGE – GENERAL C230. **Associated Specification**

C232.02 TERMINOLOGY

1. Sub-Pavement Drains are intended for the drainage of the pavement layers unless the subbase is open graded or pervious in nature in which case intra-pavement drains shall be provided. **Sub-Pavement Drains**
2. Edge Drains are intended for the drainage of rigid pavements. **Edge Drains**

C232.03 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

- C213 - Earthworks
- C230 - Subsurface Drainage - General
- C242 - Flexible Pavements
- C245 - Asphaltic Concrete

(b) Australian Standards

- AS 1289.3.3.1 - Calculation of the plasticity index of a soil.
- AS 1289.5.4.1 - Compaction control test - Dry density ratio, moisture variation and moisture ratio
- AS 1477 - PVC pipes and fittings for pressure applications.

C232.04 ORDER OF CONSTRUCTION

(a) Sub-Pavement Drains

1. Sub-pavement drains shall be constructed as soon as possible after necessary earthworks are completed in the area of the drain. Where stabilisation of the subgrade is required, sub-pavement drain shall be constructed after completion of stabilisation except that where excessive ground water is encountered, sub-pavement drains may be constructed prior to stabilisation of the subgrade. **Timing of Construction**
2. Where a Selected Material Zone is specified and excessive ground water is encountered, sub-pavement drains may be installed in two stages as follows: **Stage Construction**
 - Stage 1: Standard sub-pavement drains installed below the base of the cutting prior to placement of select material in the Selected Material Zone.
 - Stage 2: Extension of sub-pavement drain to top of the Selected Material Zone after placement of selected material.

(b) Edge Drains

1. Edge Drains shall be constructed after the construction of the rigid pavement and before the placement and compaction of verge material.

Timing of Construction

CONSTRUCTION

C232.05 SUB-PAVEMENT DRAINS

(a) Excavation

1. Trenches 300mm wide shall be trimmed to the required line and to a minimum depth of 300mm below the bottom of the subbase or below the base of the cutting where two stage construction of the Sub-Pavement Drain is required.

Trench Dimensions

2. The bottom of the trench shall be to the same grade as the design pavement surface except where the grade of the roadway is less than 0.5 per cent, in which case the depth of the trench shall be increased to provide a grade of 0.5 per cent in the trench. The bottom of the trench shall be excavated so that no localised ponding of water occurs.

Trench Grade

3. Where two stage construction of the sub-pavement is required, excavation for Stage 2 shall be carried out after placement and compaction of the Selected Material Zone. The Stage 2 trench shall be to the same line and width as Stage 1 and to a depth sufficient to provide a clean, full contact with the previously placed filter material. All excavated material shall be disposed to waste or incorporated into fills.

Two-Stage Construction

(b) Laying of Pipe

1. The 100mm diameter corrugated slotted plastic piping, complying with the Specification for SUBSURFACE DRAINAGE – GENERAL C230, shall be laid on a bed of filter material 50mm in thickness and shall be laid to the required line and grade.

Filter Bed

2. The type of filter materials shall be as shown on the Drawings.

Type

3. Joints in the pipeline shall be kept to the minimum number and, where required, shall be made using a suitable external joint coupling.

Jointing

(c) Backfilling

1. The trench shall be backfilled with filter material to the level specified. The type of filter material shall be as shown on the Drawings. The filter material shall be placed and compacted in layers with a maximum compacted thickness not exceeding 300mm. Tamping around and over the pipe shall be done in such a manner as to avoid damage or disturbance of the pipe.

Filter Material

2. The filter material shall be compacted for its full depth to a relative compaction of not less than 95 per cent (standard compaction) as determined by AS 1289.5.4.1.

Compaction

3. On the outlet section of pipes discharging through the fill batters the trench shall be backfilled with the nominated filter material to a depth of 50mm above the pipe. The balance of trench shall be backfilled with earth backfill material of maximum particle size of 50mm and shall be compacted for the full depth to a relative compaction of 95 per cent (standard compaction) as determined by AS 1289.5.4.1.

Pipe Outlet

4. In case of sub-pavement drains of two stage construction, when it is not practical to place the Pavement Layers or the Selected Material Zone immediately after the construction of Stage 1, the filter material placed to the top of Stage 1 shall be protected from scour and/or contamination by covering with a 50mm thick plug of compacted select fill material having a maximum particle size of 25mm and Plasticity Index of not more than twelve as determined by AS 1289.3.3.1. This plug, any contaminated filter material and any select material covering shall be removed and replaced with the nominated filter material and compacted immediately ahead of the placement of the pavement layer. All excavated material shall be disposed to waste or incorporated in fills.

**Temporary
Plug over
Filter Material**

(d) Cleanouts

1. Cleanouts are to be provided at the commencement of each run of sub-pavement drain line and at intervals of approximately 60m or as shown on the Drawings.

Location

2. Details of the required cleanout construction are shown on the Standard Drawing SD-D-040.

Details

(e) Outlets

1. Outlets are to be provided at maximum intervals of 150m. Where possible sub-pavement drains shall discharge into gully pits and other stormwater drainage structures. Where not possible, an outlet shall be constructed of unslotted plastic pipe of the same diameter as the main run to discharge below the edge of the road shoulder. An outlet structure in accordance with the Standard Drawing SD-D-040 shall be constructed at the discharge end.

Location

2. The outlet shall be made rodent proof in accordance with the requirements of the Specification for SUBSURFACE DRAINAGE – GENERAL C230.

Rodent Proof

3. The outlet shall be located so that erosion of the adjacent area does not occur, or shall be protected by the placement of selected stone in the splash zone of the outlet.

**Erosion
Control**

LIMITS AND TOLERANCES

C232.06 SUMMARY OF LIMITS AND TOLERANCES

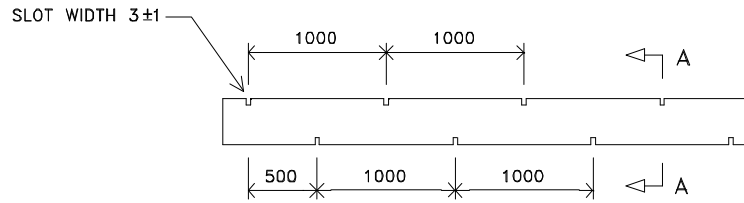
1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C232.06.1 below.

Table C232.06.1 - Summary of Limits and Tolerances

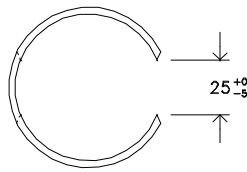
Item	Activity	Limits/Tolerances	Spec Clause
1.	Excavation		
	Trench Grade	≥0.5%	C232.05(a)
2.	Sub-Pavement Drain Backfill		
	(a) Layer thickness	300mm max	C232.05(c)
	(b) Compaction (Relative)		
	Filter material	95% Standard	C232.05(c)
	Backfill material	>95% Standard	C232.05(c)
3.	Cleanout Spacing	60m approx	C232.05(d)

ANNEXURE

C232A SLOTTING DETAILS FOR THICK WALLED UNPLASTICISED PVC PLASTIC PIPE



PLAN



SECTION A-A

Diagram not to scale
Dimensions are in millimetres