CAPRICORN MUNICIPAL DEVELOPMENT GUIDELINES

DRAINAGE STRUCTURES

C223

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

C223.01 SCOPE

C223.01.01 This Specification covers the construction of drainage structures and shall be read in conjunction with the Specification for STORMWATER DRAINAGE – GENERAL C220 and other drainage Specifications as applicable:

Associated Specifications

C221	-	Pipe Drainage
C222	-	Precast Box Culverts
C224	-	Open Drains, including Kerb and Gutter

C223.01.02 The work to be executed under this Specification consists of the construction of headwalls, wingwalls, pits, gully pits, inspection pits, junction boxes/pits, drop structures, inlet and outlet structures, energy dissipators, batter drains and other supplementary structures as shown on the Drawings.

Extent of Work

C223.01.03 Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification for STORMWATER DRAINAGE – GENERAL Annexure C220A.

Quality

C223.01.04 The following order of priority for interpretation of documents will apply: (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)

Order of Priority

(a) CMDG Drawings

(b) CMDG C223 Drainage Structures – Construction Specification

(c) Other CMDG Specifications

(d) Australian Standards

C223.02 REFERENCE DOCUMENTS

C223.02.01 Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

Documents Standards Test Methods

(a) CMDG Specifications

C213	-	Earthworks
C220	-	Stormwater Drainage - General
C221	-	Pipe Drainage
C222	-	Precast Box Culverts
C224	-	Open Drains, including Kerb and Gutter
C271	-	Minor Concrete Works

(b) Australian Standards

AS3996	-	Metal access covers, road grates and frames

CONSTRUCTION

C223.03 GENERAL

C223.03.01 Drainage structures shall be constructed in concrete and in accordance with the Specification for MINOR CONCRETE WORKS C271.

Concrete Work

C223.03.02 All structures shall be constructed as soon as practicable and shall be completed not later than 28 days after the construction of the associated culverts.

Time for Completion

C223.04 ALIGNMENT

C223.04.01 Unless otherwise shown on the Drawings, headwalls and pits shall be constructed parallel to the road centreline and wingwalls at 135^{o} to the headwall.

C223.04.02 Where the culvert is laid skew to the road, the wingwalls and headwalls shall be splayed so that the front edge of the wing bisects the angle between the centreline of the culvert and the headwall.

Skew Angle

C223.04.03 Energy dissipators shall be constructed in accordance with the Drawings and with centreline on the axis of the culvert.

Energy Dissipators

C223.05 HEADWALLS AND WINGWALLS

C223.05.01 The wingwalls shall be constructed to retain the batters effectively. Where the dimensioned drawings do not satisfy this requirement the Superintendent shall be notified before the headwalls and wingwalls are constructed. The Superintendent shall direct the Contractor as to the action to be taken.

Batter Retention

C223.05.02 Where rock is encountered at the bottom of excavations for wingwalls and headwalls, the depth of cut-off walls in uniform rock over the full width of the foundations may be reduced to less than that shown in the Drawings, but must be not less than 150mm into sound rock.

Rock Foundations

C223.06 PITS

C223.06.01 All new pits, including gully grates and frames complying with AS 3996, shall be constructed to the details shown on the Drawings. Modification of existing pits is only to be carried out if such is shown on the Drawings.

Modification

C223.07 PRECAST UNITS

C223.07.01 Where precast units are provided in the design they shall be handled and installed in accordance with the manufacturer's instructions.

Manufacturer's Instructions

C223.07.02 If the Contractor proposes to use precast units, detailed drawings and complete details of installation procedures shall be submitted for the approval of the Superintendent.

Contractor's Responsibility

C223.08 JOINTING

C223.08.01 Where drainage structures abut concrete paving, kerb and gutter or other concrete structures, a 10mm wide joint shall be provided between the structure and paving, or kerb and gutter or other concrete structures. The joint shall consist of preformed jointing material of bituminous fibreboard.

Preformed Jointing Material

C223.09 MASS CONCRETE BEDDING

C223.09.01 Mass concrete bedding for reinforced concrete bases shall not be placed on earth or rock foundations until the foundations have been inspected and approved by the Superintendent. Following such approval, the surface of the foundation shall be dampened and a layer of concrete not less than 50mm thick shall be placed over the excavated surface and shall be finished to a smooth even surface.

Mass Concrete Base Foundation Inspection

C223.09.02 Non-reinforced concrete bases may be cast on earth or rock foundations without the mass concrete bedding.

Non-reinforced Concrete Base

C223.10 BACKFILL

C223.10.01 Backfilling shall not commence until the compressive strength of concrete has reached at least 15MPa unless otherwise approved by the Superintendent. ***Commence-ment***

C223.10.02 Selected backfill shall be placed against the full height of the vertical faces of structures for a horizontal distance equal to one-third the height of the structure. ***Selected Backfill***

C223.10.03 Selected backfill shall consist of a granular material in accordance with the requirements in the Specification for EARTHWORKS C213. ***Composition***

C223.10.04 Special care shall be exercised to prevent wedge action against vertical surfaces during the backfilling. Where the sides of the excavation are steeper than 4 horizontally to 1 vertically they shall be cut in the form of successive horizontal terraces at least 600mm in width, as the backfill is placed. ***Horizontal Terraces***

C223.10.05 Backfill on both sides of the structure shall be carried up to level alternately in layers so as to avoid wedge action or excessive horizontal forces. Backfilling and compaction shall commence at the wall. Compaction shall be in accordance with the Specification for STORMWATER DRAINAGE – GENERAL C220. ***Procedure***

LIMITS AND TOLERANCES

C223.11 SUMMARY OF LIMITS AND TOLERANCES

C223.11.01 The limits and tolerances applicable to the various clauses in this Specification are summarised in **Table C223. 11.1** below:

Table C223. 11.1 - Summary of Limits and Tolerances

Item	Activity	Limits/Tolerances	Spec Clause
1.	**Cut-off Walls**		
	Depth into sound rock	>150mm	C223.05
2.	**Mass Concrete Bedding**	>50mm	C223.09