

DEVELOPMENT
CONSTRUCTION
SPECIFICATION

C220

STORMWATER DRAINAGE
GENERAL

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>EXAMPLE 1</i>	<i>Provision for acceptance of nonconformance with deduction in Payment</i>	<i>XYZ.00</i>	<i>AP</i>	<i>KP</i>	<i>2/6/97</i>
A	AS/NZS 3725	C220.04	M	MD	11/12/2013

SPECIFICATION C220: STORMWATER DRAINAGE - GENERAL

GENERAL

C220.01 INTRODUCTION

1. This is the general Specification common and applicable to all types of drainage lines, open drains, kerb and gutter, and drainage structures and shall be read in conjunction with drainage Specifications: **Purpose**

C221	-	Pipe Drainage
C222	-	Precast Box Culverts
C223	-	Drainage Structures
C224	-	Open Drains, including Kerb and Gutter
D05	-	Council's Drainage Design Code

C220.02 SCOPE

1. The work to be executed under this Specification consists of:
- (a) preparation for stormwater drainage construction,
 - (b) temporary drainage during construction,
 - (c) siting of pipes, pipe arches and box culverts.
 - (d) all activities and quality requirements associated with excavation and backfilling,
 - (e) all concrete work associated with stormwater drainage.

C220.03 EXTENT OF WORK

1. Details of the work are shown on the Drawings.

C220.04 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) Other Council Specifications

C211	-	Control of Erosion and Sedimentation
C213	-	Earthworks
C271	-	Minor Concrete Works

(b) Australian Standards

AS 1289.5.4.1	-	Compaction control test - Dry density ratio, moisture variation and moisture ratio
AS 1289.5.7.1	-	Compaction control test (Rapid Method)

DRAINAGE

AS/NZS 3725 Loads on Buried Concrete Pipes

(c) Other Publications

Concrete Pipe Selection and Installation, Concrete Pipe Association of Australia

CONSTRUCTION

C220.05 TEMPORARY DRAINAGE DURING CONSTRUCTION

- | | | |
|----|--|------------------------------------|
| 1. | All drainage works carried out by the Contractor shall comply with the SOIL & WATER MANAGEMENT PLAN. | Control |
| 2. | The Contractor shall make adequate provision for runoff at drainage works under construction to avoid damage or nuisance due to scour, sedimentation, soil erosion, flooding, diversion of flow, damming, undermining, seepage, slumping or other adverse effects to the Works or surrounding areas and structures as a result of the Contractor's activities. | Contractor's Responsibility |
| 3. | The Contractor shall not implement any proposals to dam up or divert existing watercourses (either temporarily or permanently) without the prior approval of the Principal Certifying Authority. | Limitations |
| 4. | The Contractor's material and equipment shall be located clear of watercourses or secured so that they will not cause danger or damage in the event of large runoff. | Location of Equipment |

C220.07 EXCAVATION

- | | | |
|----|--|---|
| 1. | Before undertaking stormwater drainage excavation, topsoil shall be removed in accordance with the Specification for EARTHWORKS. | Topsoil |
| 2. | The Contractor shall provide any shoring, sheet piling or other stabilisation of the sides necessary to comply with statutory requirements. | Safety |
| 3. | Where public utilities exist in the vicinity of stormwater drainage works the Contractor shall obtain the approval of the relevant authority to the method of excavation before commencing excavation. | Approval by Public Utility Authorities |
| 4. | Trench or foundation excavation for stormwater drainage works shall be undertaken to the planned level for the bottom of the specified bedding or foundation level. All loose material shall be removed by the Contractor. | Excavation Level |
| 5. | Any material at the bottom of the trench or at foundation level which the Geotechnical Engineer and/or Principal Certifying Authority deems to be unsuitable shall be removed and replaced with backfill material. The bottom of the excavated trench or foundation, after any unsuitable material has been removed and replaced, shall be parallel with the specified level and slope of the culvert. | Unsuitable Material |

C220.08 BACKFILLING & INSPECTION

1. Backfilling shall be carried out in accordance with the requirements of the relevant culverts or drainage structures Specifications and to the compaction requirements specified below.
2. The Contractor shall arrange for the Principal Certifying Authority to inspect the pipe laying operation at the following stages:
 - a. upon placing & compaction of the bedding material,
 - b. upon laying the pipe and backfilling to haunch zone.

C220.09 COMPACTION

1. Foundations, bedding and backfilling shall be compacted to the following requirements when tested in accordance with AS 1289.5.4.1 for standard compactive effort.

Standard

	Relative Compaction
Foundations or trench base to a depth of 150mm below foundation levels	95%
Material replacing unsuitable material	95%
Bedding material	95%
Selected backfill and ordinary backfill material	
a. below 1.0m of finished surface	95%
b. within 1.0m of finished surface	100%
Backfill material within the selected material zone	100%

2. All material shall be compacted in layers not exceeding 150mm compacted thickness. Each layer shall be compacted to the relative compaction specified before the next layer is commenced.

Layers

3. At the time of compaction, the moisture content of the material shall be adjusted so as to permit the specified compaction to be attained at a moisture content which, unless otherwise approved by the Geotechnical Engineer, is neither less than 60 per cent nor more than 95 per cent of the apparent optimum moisture content, as determined by AS 1289.5.7.1 (standard compaction).

**Moisture
Content**

4. When compacting adjacent to culverts or drainage structures, the Contractor shall adopt compaction methods which will not cause damage or misalignment to any culvert or drainage structure

Precautions**C220.10 CONCRETE WORK**

1. For all concrete work, the Contractor shall comply with the Specification for MINOR CONCRETE WORKS in relation to the supply and placement of normal class concrete and steel reinforcement, formwork, tolerances, construction joints, curing and protection.

Specification

C220.11 SPRAYED CONCRETE

1. If sprayed concrete has been specified, shown on the Drawings or directed by the Superintendent, it shall comply with requirements in the Specification for MINOR CONCRETE WORKS. ***Standard***

LIMITS AND TOLERANCES

C220.14 SUMMARY OF LIMITS AND TOLERANCES

1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C220.1 below:

Item	Activity	Limits/Tolerances	Spec Clause
1.	Relative Compaction (Standard / Density Index)		
	(a) Foundations or trench base to a depth of 150mm below foundation levels	95% Standard	C220.09
	(b) Material replacing unsuitable material	95% Standard	C220.09
	(c) Bedding zone material	Density Index >70	C220.09
	(d) Haunch and Side zone Material	Density Index > 70	C220.09
	(e) Overlay Zone in roadways elsewhere		C220.09
2.	Backfill		
	(a) Layers	≤ 150mm	C220.09
	(b) Moisture Content	>60%, <95%	C220.09

Table C220.1 - Summary of Limits and Tolerances

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