TWEED SHIRE COUNCIL

DEVELOPMENT CONSTRUCTION SPECIFICATION

C220

STORMWATER DRAINAGE
GENERAL

VERSION 1.2

SPECIFICATION C220 – STORMWATER DRAINAGE GENERAL

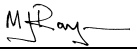
CITATION

This document is named “Tweed Shire Council, Development Construction Specification C220 - Stormwater Drainage General”.

ORIGIN OF DOCUMENT, COPYRIGHT

This document was originally based on AUS-SPEC - Development Construction Specification C220 - Stormwater Drainage General, April 2000 (Copyright SWR-TM). Substantial parts of the original AUS-SPEC document have been deleted and replaced in the production of this Tweed Shire Council Development Specification. The parts of the AUS-SPEC document that remain are still subject to the original copyright.

VERSIONS, C220 STORMWATER DRAINAGE GENERAL

VERSION	AMENDMENT DETAILS	CLAUSES AMENDED	DATE ISSUED (The new version takes effect from this date)	Authorised by the Director of Engineering Services
1.1	Original Version		1 July 2003	
1.2	Replace all references to SWAC with "Certifying Engineer" Remove reference to AS 1289.5.7.1	Various C22.04; C220.09	5 February 2016	

DEVELOPMENT CONSTRUCTION SPECIFICATION C220

STORMWATER DRAINAGE - GENERAL

GENERAL

C220.01 INTRODUCTION

1. Drainage works shall form a complete system carrying water through and away from the Works. ***Purpose***

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

   C221 - Pipe Drainage

   C222 - Precast Box Culverts

   C223 - Drainage Structures

   C224 - Open Drains, including Kerb and Gutter

   as applicable to particular subdivision works.

C220.02 SCOPE

1. This Specification is for: ***Scope***

   (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, bedding and backfilling,

   (e) all concrete work associated with stormwater drainage.

2. Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in the Specification Part for Quality Requirements. ***Quality***

C220.03 RESERVED

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 control

(c) Standard Drawings that apply to this Section:

S.D.101 - S.D.110 Stormwater Series

CONSTRUCTION

C220.05 TEMPORARY DRAINAGE DURING CONSTRUCTION

1. All drainage works carried out by the Subdivider shall comply with the Specification for CONTROL OF EROSION AND SEDIMENTATION. ***Control***

2. The Subdivider shall make adequate provision for runoff flows 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 Subdivider's activities. ***Subdivider's Responsibility***

3. The Subdivider shall not implement any proposals to dam up or divert existing watercourses (either temporarily or permanently) unless specifically approved within the design plans. ***Limitations***

4. The Subdivider'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 flows. ***Location of Equipment***

C220.06 SITING OF CULVERTS

1. Before commencing construction of any culvert, the Subdivider shall set out on site the culvert inlet and outlet positions to the location and levels shown on the design plans, and shall present this set-out for inspection by the Certifying Engineer. ***Set-out***

2. The Certifying Engineer may amend the inlet or outlet locations or designed levels or the culvert length to suit actual site conditions ***Amendments to planned work***

C220.07 EXCAVATION

1. Before undertaking stormwater drainage excavation, topsoil shall be removed in accordance with the Specification for EARTHWORKS. ***Topsoil***

2. In undertaking trench excavation, the Subdivider 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 Subdivider shall obtain the approval of the relevant authority to the method of excavation before commencing excavation. ***Approval by Public Utility Authorities***

4. Excavation by blasting, if permitted by Council, shall be carried out to ensure that the peak particle velocity measured on the ground adjacent to any previously installed culvert of drainage structure does not exceed 25 millimetres per second. The Subdivider shall comply with other requirements concerning blasting operations in the Specification for EARTHWORKS. ***Blasting Operation***

5. 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. The Subdivider shall remove all loose material. ***Excavation Level***

6. Any material at the bottom of the trench or at foundation level which the Certifying Engineer deems to be unsuitable shall be removed and disposed in accordance with the Specification for EARTHWORKS by the Subdivider and replaced with backfill material in accordance with the requirements of this Specification and the Specifications for particular culvert types. 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***

7. The excavated material shall be used in the construction of embankments backfilling or spoiled in accordance with the Specification for EARTHWORKS. ***Spoil***

C220.08 BACKFILLING

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.

C220.09 COMPACTION

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

	Relative Compaction
Foundations or trench base to a depth of 150mm below foundation levels	95%
Material replacing unsuitable material	95%
Bedding material (other than for pipe drainage)	95%
Selected backfill and ordinary backfill material	
• below 1.5m of finished surface	95%
• within 1.5m of finished surface	100%
Backfill material within the selected material zone	100%

Compaction requirements adjacent to pipe drainage for concrete, steel or UPVC pipes are set out in the specification for PIPE DRAINAGE.

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 Certifying Engineer, is neither less than 60 per cent nor more than 100 per cent of the apparent optimum moisture content, as determined by AS 1289.5.4.1 (standard compaction). ***Moisture Content***

4. When compacting adjacent to culverts or drainage structures, the Subdivider shall adopt compaction methods, which will not cause damage or misalignment to any culvert or drainage structure. Any damage caused shall be rectified, and all costs of such rectification shall be borne by the Subdivider. ***Precautions*** ***Subdivider's Cost***

C220.10 CONCRETE WORK

1. For all concrete work, the Subdivider 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 design plans or directed by the Certifying Engineer, it shall comply with requirements in the Specification for MINOR CONCRETE WORKS. ***Standard***

SPECIAL REQUIREMENTS

C220.12 RESERVED

C220.13 RESERVED

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.	**Excavation by Blasting**		
	Peak particle velocity	≤ 25mm/sec	C220.07
2.	**Relative Compaction (Standard)**		
	(a) Foundations or trench base to a depth of 150mm below foundation levels	95%	C220.09
	(b) Material replacing unsuitable material	95%	C220.09
	(c) Bedding material	95%	C220.09
	(d) Selected backfill and ordinary backfill material:		C220.09
	• below 1.5m of finished surface	95%	
	• within 1.5m of finished surface	100%	
	(e) Backfill material within the selected material zone	100%	C220.09
3.	**Backfill**		
	(a) Layers	≤ 150mm	C220.09
	(b) Moisture Content	>60%, <100%	C220.09

Table C220.1 - Summary of Limits and Tolerances