



Construction Specification for Civil Works

C217 - Basins

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ORIGIN OF DOCUMENT, COPYRIGHT

This document has been developed for use with the construction of civil works within the Tamworth Regional Council local government area.

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REVISIONS: C2xx – BASINS

REVISIONS	CLAUSES AMENDED	AMENDMENT DETAILS	DATE
1		Not Issued	N/A
2		Original Issue	01/05/2023

GENERAL

C217.01 SCOPE

Scope

The work to be executed under this Specification consists of:

- (a) basin materials
- (b) basin excavation
- (c) basin wall construction
- (d) revegetation and scour protection
- (e) signage

C217.02 DEFINITIONS

The Works – Defined as follows:

The Works

- **Developer Infrastructure Works** - work includes subdivisions and any public infrastructure work associated with an approved Development in the TRC local government area requiring a construction certificate.
- **Contracted Works** – infrastructure work undertaken by a Principal Contractor or subcontractor formally appointed by TRC and supervised by TRC.
- **Internal Works** - infrastructure work undertaken by TRC’s day labour workforce.

Constructor – Defined as the organisation responsible for construction of the Works and the Principal Contractor as defined in the *Work Health and Safety Act 2011*.

Constructor

TRC Representative – Defined as follows:

TRC Representative

- **Developer Infrastructure Works** – Nominated TRC officer(s) for the approved Development.
- **For Contracted Works** – the Superintendent.
- **For Internal Works** – TRC Asset Owner

Constructor’s Representative – Defined as follows:

Constructor’s Representative

- **Contracted Works** – the Principal Contractor’s nominated representative as per the relevant contract.
- **Internal Works** – TRC officer responsible for delivery.

Developer’s Representative– Defined as the person or organisation appointed by the Developer to administer the Constructor responsible for the delivery of **Developer Infrastructure Works**.

Developer’s Representative

C217.03 REFERENCES

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

Where not otherwise specified in the relevant Specifications or the approved design drawings, the Constructor shall use the latest versions of the Reference documentation, including amendments and supplements, listed in the Specifications at the time of the Works approval.

Currency

(a) **Tamworth Regional Council (TRC) Specifications**

C211 - Control of Erosion and Sedimentation.

C212 - Clearing and Grubbing.

C213 – *Earthworks*.

C221 – *Pipe Drainage*.

C273 – *Landscaping*.

(b) Australian Standards

References in this Specification or on the approved design drawings to Australian Standards are noted by their prefix AS or AS/NZS.

- AS 1289.3.8.1 - Methods of testing soils for engineering purposes Soil classification tests - Dispersion - Determination of Emerson class number of a soil
- AS 1289.5.1.1 - Determination of the dry density/moisture content relation of a soil using standard compactive effort.
- 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).

(c) Legislation

Environmental Planning and Assessment Act 1979 (EP&A Act)

Dams Safety Act 2015

Hold Point

All proposed deviations from the approved design drawings, TRC Standard Drawings, this Specification or the documents referenced within it, shall be submitted for approval to the TRC Representative with supporting evidence at least five (5) working days prior to the work being undertaken.

Process Held: The lot or element affected by the proposed deviation

Hold Point

C217.04 BASIN MATERIALS

Materials used to construct the core of fill walls of basins must NOT include the following materials:

- Materials with clay (less than 2 microns) content less than 15%
- Hard clay lumps which will not readily absorb the required moisture content
- Materials with Emerson Class Number of 1 or 2
- Materials that have a permeability coefficient of more than 10^{-8} m/s
- Materials that are prone to piping and surface erosion
- Materials that contain rubbish, roots or organic material
- Materials contaminated through past site usage
- Materials with plasticity index of less than 10
- Over wet materials
- Material, stones or rock fragments with dimensions greater than 75mm
- Demolition rubble

Materials shall also be in accordance with C213 – *Earthworks*.

**Material
Characteristics**

C217.05 BASIN EXCAVATION

Excavation of basins shall be carried out in accordance with C213 – *Earthworks*.

C217.06 BASIN WALL CONSTRUCTION

Construction of basin walls shall be carried out in accordance with C213 – *Earthworks*.

(a) Foundation Preparation for Basin Wall Construction

Scarify the stripped and prepared surfaces as indicated in preparation for pre-rolling. Should the cleared foundation area be dry and cracked prior to scarifying, thoroughly water the area and ensure that compaction of the scarified material complies with the Construction requirements. Pre-roll the foundation with one (1) pass of a padfoot roller immediately after scarification / watering and immediately prior to placement of fill materials.

***Basin wall
Foundation***

(b) Basin Wall Construction

Prior to compaction of the layers, condition all material by breaking fill up into fragments less than 75mm size, laying out in layers of uniform loose thickness, and bringing up to an appropriate water content by aeration and drying or wetting. Spread and compact fill in layers not exceeding 150mm thickness prior to compaction. All layers of fill placed in the works must be uniformly compacted over the full area and depth of the layer to achieve the acceptable compaction specified before the next layer is commenced. Compact fill using a padfoot roller. In confined places or where a padfoot roller may damage adjacent structures hand operated tamping equipment is to be used.

A gravel crest layer of minimum 100mm shall be constructed on the basin crest. A minimum topsoil cover of 100mm shall be applied to the batters and crest.

(c) Testing Requirements

Moisture Content - Maintain moisture content of the fill at the time of placing and compacting within +2% to -1 % of Optimum Moisture Content (OMC) when the particular material is subjected to the Standard Compaction Test (AS1289.5.1.1).

Moisture Content

Fill Density - Compact each layer until the dry density ratio is in excess of 98% of the maximum dry density as determined by the standard compaction test (AS1289.5.3.1).

Density

The density and moisture content of the compacted fill shall be monitored using the Nuclear Densometer Method or Compaction Control Test - Rapid Method given in TfNSW Test Method T162.

Control test frequency shall be one test per 100m³ of fill material.

Rate of Testing

Witness Point

The Constructor shall submit to the TRC Representative and/or the Developer's Representative (for Developer Infrastructure Works) all test results verifying conformity of compaction, moisture content and material requirements.

Witness Point

C217.07 BATTER TOLERANCES

The tolerances for the absolute location of the crest and toe of batters, shall be ± 50mm. Batters must not have undulations in the general plane of the batter.

***Batter
Tolerances***

The grade of batters must not increase above 1 in 4 due to construction tolerances.

The design volume of a detention basin must not be decreased by more than 2% due to construction tolerances.

***Volume
Tolerances***

C217.08 REVEGITATION

The floors of all earth basins and walls of batters 0.5m above floor level shall be appropriately stabilised to prevent erosion and scouring with turf of an appropriate species. The remainder of internal and external batters of earth basins shall be provided with topsoil and seeded with appropriate grass species.

C217.09 SIGNAGE

Signage shall be provided at all retention/detention basins indicating the depth of water. Signs are to be erected such that two signs and one depth indicator are visible from any one point of the basin embankment at any time.

LIMITS AND TOLERANCES

C217.10 SUMMARY OF LIMITS AND TOLERANCES

The limits and tolerances applicable to the various clauses in this Specification are summarized in Table C217.1 below:

Item	Activity	Limits/Tolerances	Spec Clause
1	Batter Slopes		
	a) absolute position	± 50mm	C217.07
	b) volume	- 2%	C217.07
	c) batter slopes	1 in 4 maximum slope	C217.07
4	Compaction		
	Fill embankments - Compaction	Relative compaction > 98% (standard)	C217.06
	Fill embankments - Moisture content	+2% to -1 % of (OMC)	C217.06

Note: Plus (+) is towards the roadway/surface and minus (-) is away from the roadway/surface. Tolerances are measured at right angles to design surfaces.

Table C217.1 - Summary of Limits and Tolerances

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