

NOTE 12 – QUALITY AND FINISH OF CONCRETE INFRASTRUCTURE; FOOTPATHS, KERB AND CHANNEL AND CONCRETE PAVEMENT

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INTRODUCTION

This Design Note reiterates the standards for the quality and finish of concrete infrastructure. Guidance is provided on expected standards and provides information for contractors to improve the likelihood of delivering acceptable works.

There are numerous standards governing the delivery of concrete infrastructure. Where civil assets are created in new subdivisions or through reinstatement activities, acceptance of works is subject to demonstrated compliance with relevant provisions of VicRoads Specifications or Austroads standards¹.

RELEVANT STANDARDS

Concrete works are to be delivered for the City of Greater Geelong in accordance with the following standards (unless otherwise agreed in writing):

- Infrastructure Design Manual (IDM)
- VicRoads Section 703 - General Concrete Paving
- AS1379- Specification and Supply of Concrete
- AS 2876 – Concrete Kerbs and Channel (Gutters)
- AS3600- Concrete Structures
- AS3610- Formwork for Concrete
- AS3727- Pavements -Part 1- Residential
- AS3799- Liquid membrane-forming curing compounds for concrete.
- CCAA - Residential concrete driveways and paths (2017)
- CCAA- Guide to Residential Streets and Paths (2004)

¹ Infrastructure Design Manual (IDM) section 7.4

STRENGTH

Strength is a basic performance-based requirement of all civil concrete assets and is to be specified on design drawings. The strength of concrete is to comply with the following requirements.

STRENGTH	
ASSET CLASS	Type
FOOTPATH	Minimum 32 MPa (N32)
VEHCILE CROSSING INFILL	Minimum 32 MPa (N32)
KERB AND CHANNEL	Minimum 280kg/m ³ (28Mpa)
CONCRETE PAVEMENT	Austrroads Guide to Pavement Technology 2010 and the Guide to Structural Design of Road Pavements 2006, with a minimum 20-year design life

Appropriate documentation shall be provided to prove the design criteria has been achieved. Testing is to be performed in accordance with AS 1379. Council inspectors will request this documentation to verify quality of concrete and testing of the supplied concrete may also be undertaken or requested by council if the concrete strength is an issue. Strength may also be verified by in-field rebound hammer test (by a suitably qualified practitioner).

CURING

Curing of concrete is critical for strength development and surface finish. An appropriate curing method in accordance with the Australian Standards must be employed on all concrete infrastructure. To allow correct curing of the concrete, it is important to protect the footpath from vehicles for a minimum of 4 days (unless otherwise approved). Evidence of curing must be available through Inspection and Test Plan using docketts or photos.

CRACKING

Cracking of concrete elements may indicate inadequate strength or reinforcement. Where cracking is identified at any time between before the end of a 12-month Defects Liability Period, and it is considered a defect, The City of Greater Geelong will require the relevant section to be replaced (unless otherwise agreed in writing).

SURFACE FINISH

The City of Greater Geelong expects a dense concrete free from voids, honeycombing, segregation or surface defects². Surface finish can indicate improper curing or the addition of too much water during finishing or environmental effects. Please note that the Class 3 finish as specified in VicRoads Section 703 - General Concrete Paving will not be applicable to footpath, kerb and channel or concrete pavements. The finish of concrete is to comply with the following requirements.

SURFACE FINISH	
ASSET CLASS	Type
FOOTPATH	Lightly textured nonslip surface (broom finish)
VEHCILE CROSSING INFILL	Lightly textured nonslip surface (broom finish)
KERB AND CHANNEL	Smooth trowel finish
CONCRETE PAVEMENT	Rotary trowel lightly textured finish

² VicRoads Standard Specification 703.08

EXAMPLES

FOOTPATHS

**ACCEPTABLE:
FOOTPATH
CRACKING LESS
THAN 0.2MM**



**UNACCEPTABLE:
FOOTPATH
CRACKING
GREATER THAN
1MM IN WIDTH**



**UNACCEPTABLE:
INSUFFICIENT
FOOTPATH BASE
PREPARATION,
FOOTPATH NOT
SUPPORTED**



KERB AND CHANNEL

**ACCEPTABLE:
KERB CRACKING
LESS THAN 0.2 MM**



**UNACCEPTABLE:
KERB CRACKING
GREATER THAN
1MM**



**UNACCEPTABLE:
KERB
"CROCODILE" OR
CRAZE CRACKING
IN KERBING**



SURFACE FINISH

ASSET CLASS

Type

FOOTPATH

Heavy Textured broom finish

KERB AND CHANNEL

Smooth trowel finish

CONCRETE PAVEMENT

Rotary trowel lightly textured finish

ACCEPTABLE: FOOTPATH SURFACE FINISH



ACCEPTABLE: KERB SURFACE FINISH



SURFACE FINISH

**ACCEPTABLE: FOOTPATH BUILDERS
SCRAPING /
DAMAGE AT END OF 12-MONTH
LIABILITY PERIOD**



**ACCEPTABLE: KERB
BUILDERS DAMAGE AT END OF 12-MONTH
DEFECTS LIABILITY PERIOD**



ACCEPTABLE: FOOTPATH SURFACE FINISH



SURFACE FINISH

**UNACCEPTABLE: STANDARD LIGHT BROOM
FINISH FOOTPATH LOSS OF SURFACE AND
EXPOSURE OF AGGREGATE**



**UNACCEPTABLE: FOOTPATH
EXPOSED AGGREGATE**



**UNACCEPTABLE: KERB CROCODILE
CRACKING**

