



ACT
Government

CONCRETE PATHS, DRIVEWAYS, MEDIANS 06B

MUNICIPAL
INFRASTRUCTURE
TECHNICAL
SPECIFICATION
**06 - CONCRETE KERBS
FOOTPATHS &
MINOR WORKS**

Transport Canberra and
City Services

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1 PATHS, DRIVEWAYS AND MEDIANS

1.1 General

1.1.1 Responsibilities

1.1.1.1 Objectives

Requirement: Provide concrete or asphalt pavements for paths, driveways, median toppings and works of a similar nature as documented.

1.1.2 Cross references

General: The following documents are related to this Specification.

1.1.2.1 ACT Legislation

Work Health and Safety Act

1.1.2.2 Specifications

Requirement: Conform to the following:

MITS 00	Preliminaries
MITS 01	Roadwork
MITS 02	Earthworks
MITS 03	Underground services
MITS 04	Flexible pavements
MITS 07	Segmental paving
MITS 09	Landscape
MITS 10	Concrete works
MITS 12	Street lighting

1.1.2.3 Design Standards

General: The following Design Standards are related to this specification:

MIS 03	Pavement design
MIS 05	Active travel facilities design
MIS 07	Driveways

1.1.3 Referenced documents

General: The following documents are incorporated into this Specification by reference:

1.1.3.1 Standards

Australian standards

AS 1012	Methods of testing concrete
AS 1012.3.1	Determination of properties related to the consistency of concrete – Slump test
AS 1141	Methods for sampling and testing aggregates
AS 1141.14	Particle shape, by proportional calliper
AS 1141.22	Wet/dry strength variation
AS 1141.23	Los Angeles value
AS 1141.52	Unconfined cohesion of compacted pavement materials
AS 1160	Bitumen emulsions for construction and maintenance of pavements
AS 1289	Methods of testing soils for engineering purposes.
AS 1289.3.1.1	Soil classification tests – Determination of the liquid limit of a soil – Four point Casagrande method
AS 1289.3.3.1	Soil classification tests – Calculation of the plasticity index of a soil
AS 1289.3.4.1	Soil classification tests – Determination of the linear shrinkage of a soil – Standard method
AS 1289.3.6.1	Soil classification tests – Determination of the particle size distribution of a soil – Standard method of analysis by sieving
AS 1289.6.1.1	Soil strength and consolidation tests – Determination of the California Bearing Ratio of a soil – Standard laboratory method for a remoulded specimen
AS 1348	Glossary of terms – Roads and traffic engineering
AS 1379	Specification and supply of concrete
AS 1428	Design for access and mobility
AS/NZS 1428.4.1	Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
AS 1478	Chemical admixtures for concrete, mortar and grout
AS 1478.1	Chemical admixtures for concrete
AS 2150	Hot mix asphalt – a guide to good practice
AS 2157	Cutback bitumen
AS 2758	Aggregates and rock for engineering purposes
AS 2758.1	Concrete aggregates
AS 2758.5	Coarse asphalt aggregates
AS 2876	Concrete kerbs and channels (gutters) - Manually or machine placed
AS 2891	Methods of sampling and testing asphalt
AS 2891.5	Compaction of asphalt by Marshall Method and determination of stability and flow
AS 3582	Supplementary cementitious materials for use with portland and blended cement

AS 3582.1	Supplementary cementitious materials Fly ash
AS 3600	Concrete structures
AS 3798	Guidelines on earthworks for commercial and residential developments
AS 3799	Liquid membrane-forming curing components for concrete
AS 3972	General purpose and blended cements
AS/NZS 4455	Masonry units, pavers, flags and segmental retaining wall units
AS/NZS 4455.2	Pavers and flags
AS 4663	Slip resistance measurement of existing pedestrian surfaces
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4680	Hot-dipped galvanized (zinc) coatings on fabricated ferrous articles

1.1.3.2 Other publications

Proprietary products: To *TCCS Products previously considered for use list*

Austroads

AGPT	Austroads Guide to Pavement Technology
AGPT04A	Part 4A: Granular base and subbase materials

Concrete Institute of Australia

CIA CPN35	Fibres in concrete
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1.1.4 Interpretation

1.1.4.1 Abbreviations

General: For the purposes of this Specification the following abbreviations apply:

CBR:	California Bearing Ratio.
CRB:	Crushed Rock Base.
CRS:	Crushed Rock Subbase.
NGB:	Natural Gravel Base.
NGS:	Natural Gravel Subbase.
RCCB:	Recycled crushed concrete base.
RCCS:	Recycled crushed concrete subbase.
TCCS:	Territory and Municipal Services, ACT Government, and its successors.

1.1.4.2 Definitions

General: For the purpose of this Specification, the definitions of terms used to define the components of the road reserve are in conformance with *AS 1348, Glossary of Austroads Terms* and *AGRD03*, the definitions given below also apply:

Island slot: An at grade path crossing through a median, as defined in *ACTSD -0515-0516*.

Kerb ramp: A layback section of kerb connecting the road pavement to a path, as defined in *ACTSD -0515-0516*.

Vehicle crossing: A layback section of kerb connecting the road pavement to a driveway, as defined in ACTSD -0701-0704.

1.1.5 Hold points and witness points

1.1.5.1 Notice

General: Give written notice to the Authorised person so that the documented inspection and submissions may be made to the **Hold point table** and the **Witness point table**.

Table 6B-1 Hold point table

Item	Clause title	Requirement	Notice for inspection	Release by
Materials				
6B.1	Concrete - General	NATA compliance certificates for concrete and constituents	3 working days prior to commencement on site	Authorised Person
6B.2	Concrete – Coloured concrete	Submit two test panels of each different colour concrete type.	5 working days before ordering	Authorised Person
6B.3	Concrete – Exposed aggregate	Submit proposed methodology for exposed aggregate finish	5 working days before commencement of concreting	Authorised Person
Execution				
6B.4	Preparation of subgrade - Compaction	Compacted subgrade before installation of polyethylene sheeting or a blinding layer or sand	1 working day prior to commencement of laying subbase	Authorised Person

Table 6B-2 Witness point table

Item	Clause title	Requirement	Notice for inspection
Execution			
6B.1	Preparation of base and subbase - Compaction	Compacted base and subbase prior to commencement of concreting	1 working day
6B.2	Concrete - Installation of reinforcement	Completed reinforcement placement prior to commencement of concreting	1 working day

1.2 Materials

1.2.1 Subgrade

1.2.1.1 General

Standard: To AS 3798 Section 4.

Quality: Clean, stable, free of perishable material and capable of compaction to the documented density.

Re-use of excavated material: Only re-use suitable material in conformance with AS 3798 clause 4.4.

1.2.2 Subbase

1.2.2.1 General

General: Provide subbase to conform to *MITS 04 Flexible pavement construction* or Crusher dust to conform to this Specification.

Maximum particle size: Not more than one third of the subbase thickness.

Maximum amount passing 75µm sieve: 15%.

Material properties: Unless noted otherwise, conform to the following:

- > Liquid Limit ≤35% to AS 1289.3.1.1
- > Plasticity Index: ≤12% to AS 1289.3.3.1
- > Linear Shrinkage: ≤6% to AS 1289.3.4.1

1.2.3 Concrete

1.2.3.1 General

Specification: Concrete properties and delivery, reinforcement, formwork, placing, compaction, finishing, curing and protection to conform to *MITS 10 Concrete works*.

Concrete strength grade: Unless noted otherwise, conform to the following:

- > Paths, unreinforced concrete driveways, median toppings and works of a similar nature: N25.
- > Reinforced concrete driveways: N32.

Documentation: Submit NATA registered Compliance Certificates for all constituents of the mix as verification of the mix suitability.

This is a **HOLD POINT**.

1.2.3.2 Coloured concrete

Coloured concrete: Include integral colouring with mineral oxide pigments in the approved mix design. Provide test panels to the Authorised Person.

This is a **HOLD POINT**.

1.2.3.3 Exposed aggregate

Exposed aggregate finish: Not permitted without TCCS approval. Finish shall be achieved through dry blasting unless noted otherwise.

Submit proposed methodology for exposed aggregate finish to the Authorised Person for approval.

This is a **HOLD POINT**.

1.2.3.4 Curing compound

Specification: To *MITS 10 Concrete works*.

Paths and driveways: Wax emulsion curing compounds shall not be used on areas subject to pedestrian traffic.

1.2.4 Other materials

1.2.4.1 Asphalt paths

Specification: To *MITS 04 Flexible pavement construction*.

1.2.4.2 Segmental pavers

Specification: To *MITS 07 Segmental paving*.

1.2.4.3 Tactile ground surface indicators

Specification: To *MITS 07 Segmental paving*.

1.3 Execution

1.3.1 Provision for traffic

1.3.1.1 General

Requirement: Conform to *MITS 01 Traffic Management*.

1.3.2 Site establishment

1.3.2.1 Survey

Requirement: Confirm site surface and benchmarks. Conform to *MITS 00 Preliminaries*.

1.3.3 Preparation of subgrade

1.3.3.1 General

Clearing and grubbing: To *MITS 02A Clearing and grubbing*.

Subgrade preparation: To *MITS 02B Bulk earthworks*.

Removal of unsuitable material: Remove any soft, weak, saturated or organic material within the top 300mm of the subgrade to *MITS 02B Bulk earthworks*.

Path grading: Unless otherwise detailed, paths shall be constructed to a 2% crossfall. In road reserves crossfall shall be towards the road. Paths shall finish flush with all abutting surfaces. Longitudinal grades shall be in the range 1.0% to 12.5%, consistent with the adjacent road grade, unless noted otherwise. Longitudinal grades differing by more than 2% shall be connected by smooth vertical curves.

Driveway grading: Refer to the Drawings, *ACTSD -0701-0704* or reinstate to match existing.

Batters: In cut or fill generally grade to 1:6 where possible and maximum 1:4 unless noted otherwise.

1.3.3.2 Compaction

Relative compaction: Minimum 100% standard compaction.

This is a **HOLD POINT**.

1.3.4 Preparation of base and subbase

1.3.4.1 General

Spreading: Spread the material in uniform layers, without segregation.

Extent of the subbase: Extend the subbase beyond each side of the pathway, refer to *ACTSD-0501*.

Maximum thickness of layers: 150mm.

Trimming: Trim the subbase to the documented cross falls.

1.3.4.2 Compaction

Compaction: Uniformly compact the subbase to the documented density and thickness.

This is a **WITNESS POINT**.

1.3.5 Concrete

1.3.5.1 General

Concrete: Minimum compacted thickness 100mm measured at right angles to the surface of the lining.

Method: Cast-in-situ to conform to *MITIS 10 Concrete works*.

1.3.5.2 Installation of reinforcement

Specification: Conform to *MITIS 10 Concrete works*.

Location, cover and details: As shown on the Drawings.

This is a **WITNESS POINT**.

1.3.5.3 Concrete finish

Initial finishing: Screed the concrete to the level of formwork, bull float and leave to set.

Broom finish: After machine floating and steel trowelling draw a broom or hessian belt across the surface to produce a coarse even-textured scored surface perpendicular to the direction of travel. Provide tooled edges to all finished surfaces.

Slip resistance site test: Class P4 to *AS 4663 Appendix A*, if required by the contract or this Specification.

1.3.5.4 Concrete curing

General: Start curing immediately after finishing and continue for a minimum period of 3 days. Protect green concrete from rain and flowing water.

Curing method: Choose from the following methods:

- > Cover sheet method: Cover concrete surface with plastic sheets. Overlap at least 150mm and anchor down to prevent displacement.
- > Moisture application method: Spray constantly with water in form of fog or mist.
- > Curing compound method: Apply curing compound to the manufacturer's recommendations.

Coloured concrete: Do not cure by direct covering with plastic sheeting, damp sand or wet hessian. Provide suspended sheeting or chemical curing compounds.

Curing compounds: Ensure that the curing compound has been completely degraded/removed from the surface prior to applying any sealants. Wax emulsion curing compound shall not be used on paths or other areas subject to pedestrian traffic.

Inspection type: **WITNESS POINT**.

1.3.5.5 Installation of joints

General: Construct isolation, expansion, contraction and construction joints straight and plumb and extend continuously from edge to edge of the pavement.

Expansion joints (EJ) and Isolation Joints (IJ): Provide where the path abuts against other concrete structures such as pits, retaining walls, driveways and at tangent points before and after curves. Unless shown otherwise on the Drawings, conform to the following:

- > Width: Nominal 15mm.
- > Depth: Full depth concrete pavement.
- > Maximum intervals: 15m.

Weakened plane joints (WJ): Install in freshly placed concrete by saw cutting, grooving or placing a crack inducing insert. Joints shall be formed by making a cut 3mm wide for at least one quarter of the depth of paving. Cut 50% of mesh bars across the joint. Arises shall be tooled to a suitable radius. Provide at any changes in shape, at tangent points and at maximum 2:1 D:W ratio.

Paths: Weakened plane joints shall be installed at maximum 3m centres.

Saw cutting: Construct joints not more than 18 hours after pouring, when the concrete has hardened sufficiently to prevent ravelling but prior to shrinkage cracking occurring.

Grooving tool: Ensure that the groove does not fill with cement slurry and render the joint less effective.

Rigid pavements: Where concrete is being laid as part of or adjacent to rigid pavements or kerbs, joints of the same type shall align between path, driveway, median, kerb and pavement.

1.3.5.6 Joint sealing

General: Fill with joint sealer as shown on the Drawings.

Preparation: Make sure the joint space is dry, clean and free from loose material.

Sealant type: Provide silicone sealant in conformance with the manufacturer's recommendations.

1.3.5.7 Finishing

Protection: During the curing period, protect the paving surfaces from traffic and construction plant.

Reinstating adjacent surfaces: Remove side forms and reinstate surfaces adjacent to the new pavement to *MITS 09 Landscape*.

1.4 Completion

1.4.1 Submissions

Work as Executed Records: To *MITS 00B Quality Requirements*.

2 MEASUREMENT AND PAYMENT

2.1 Measurement

2.1.1.1 General

Payments made to the Schedule of Rates: To *MITS 00 Preliminaries*, this Specification, the Drawings and **Pay items**.

2.1.1.2 Methodology

General: The following methodology will be applied for measurement and payment:

- > Allow for all work, materials, testing and quality assurance requirements in each Pay Item.
- > Temporary erosion and sedimentation control measures: To *MITS 00C Control of erosion and sedimentation*.
- > Miscellaneous minor concrete work not included in the pay items in this Specification: To *MITS 10 Concrete works*.
- > Asphalt paths and driveways: To *MITS 04 Flexible pavement construction*.
- > Supply and compaction of subbase and preparation of subgrade to this Specification and not *MITS 02 Earthworks* or *MITS 04 Flexible pavement construction*.
- > Bulk earthworks: To *MITS 02B Bulk earthworks*.
- > Island slots: Measured and paid as paths to this Specification.
- > Kerb ramps and vehicle crossings: To *MITS 06A Concrete kerbs and open drains*.

Concrete payment rates: The following methodology will be applied for measurement and payment:

- > Payment: At the scheduled rates provided the concrete meets the strength requirements as documented.

2.2 Pay items

Table 6B-3 Pay items table

Item No	Pay items	Unit of measurement	Schedule of rates scope
6B.1	Paths, driveways, median toppings	m ² of concrete, measured in place.	<p>All activated associated with the supply, forming, compaction of foundations, supply and placement of subbase and base, edge thickenings, concreting, jointing, finishing, saw cutting, curing and backfilling.</p> <p>A separate pay item shall be included for each concrete thickness, grade and type.</p> <ul style="list-style-type: none"> 6B.1.1 100mm N25 Paths 6B.1.2 150mm N32 Paths 6B.1.3 150mm N32 Driveways 6B.1.4 150mm N32 Median toppings Etc...
6B.2	Reinforcement for paths, driveways, median toppings	m ² of concrete, measured in place.	<p>All activities extra over Paths, driveways, median toppings associated with the supply and placement of reinforcing steel where specified in the Drawings.</p> <p>A separate pay item shall be included for each size and configuration.</p> <ul style="list-style-type: none"> 6B.2.1 SL81 mesh single layer 6B.2.2 SL82 mesh single layer 6B.2.3 SL81 mesh double layer
6B.3	Remove existing concrete	m ² of concrete, removed	<p>All activities associated with the saw cutting of the concrete irrespective of depth, removal of all materials including reinforcement and underlying pavement courses, legal disposal of waste materials offsite and all disposal fees.</p>



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