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1 PREFACE

The Austroads series of Guides for provision and management of road and transport infrastructure provides a level of consistency across all jurisdictions in Australia and New Zealand. All road authorities have agreed to adopt the Austroads Guides as the primary technical reference, together with the relevant Australian and New Zealand Standards.

The Australian Capital Territory has adopted the Austroads Guides, and has issued a revised series of documents to reflect this development in standards and specifications for practice in the ACT. The ACT Government accepts the principles and general guidance in the Austroads Guide to Road Design. This Municipal Infrastructure Standard is issued to clarify any exceptions or additional requirements for implementation in the ACT, and to identify relevant complementary documents.

This present document is part of the ACT Municipal Infrastructure Standard (MIS) series spanning the broad scope of municipal infrastructure development and management in the ACT. Whilst based on the earlier Urban Services Design Standards for Urban Infrastructure Works, this document has been significantly expanded to incorporate new technologies and to bring it into line with Australian best practice. This revised series uses AUS-SPEC (October 2013) format wherever practical.

For the purposes of this series of standards, municipal infrastructure pertains to road works (except arterial and higher order roads), stormwater drainage and landscaping required to service residential, commercial and industrial estates for both greenfield and brownfield/urban in-fill developments. They are works to be owned and maintained by Territory and Municipal Services (TAMS) and to be constructed either by a developer and gifted to the ACT Government or constructed as part of the ACT Government Capital Works program. In all developments, if these Design Standards cannot be appropriately applied the proposed innovation should be discussed with and approved by TAMS.

Municipal Infrastructure Standards

- MIS 01 Street planning and design
- MIS 02 Earthworks and site grading
- MIS 03 Pavement design
- MIS 04 Subsurface drainage
- MIS 05 Active Travel
- MIS 06 Verges
- MIS 07 Driveways
- MIS 08 Stormwater
- MIS 09 Bridges and related structures
- MIS 10 Guardrails, fences and barriers
- MIS 11 Off-street parking
- MIS 12 Guide signs
- MIS 13 Traffic Control Devices
- MIS 14 Public lighting
- MIS 15 Urban edge Management Zone
- MIS 16 Urban open space
- MIS 17 Shopping centres and other public urban spaces
- MIS 19 Sportsground design
- MIS 20 Street and park furniture and barbeques
- MIS 21 Playgrounds and playground equipment
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**Trunk Road Infrastructure Standards**

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2 VERGES

2.1 GENERAL

2.1.1 RESPONSIBILITIES

2.1.1.1 Objectives

Objectives: Provide verge designs associated with municipal streets in the ACT. Consider the following requirements for verges:

- An improved urban structure, amenity and revitalisation that minimises whole of life costs.
- Space for the provision and maintenance of underground and above ground public utilities.
- Space for public amenities such as public telephones, post boxes and bus stops in appropriate areas.
- Landscaping including trees to improve the appearance of the streetscape.
- Drainage functions for overland flows.
- Provide for the movement of pedestrians and cyclists.
- Convenient and safe access to the roadway and blocks for pedestrians, vehicles and cyclists.
- Conformance to the Disability Discrimination Act.
- Appropriate access for buses, emergency and service vehicles.
- A buffer area for reduction in traffic noise level at dwellings.
- An area to adjust for level differences between the carriageway and blocks.
- Consideration to Safety in design, operation and demolition.

Requirement: The verge should be of sufficient width to allow space for all relevant services, landscaping, indented parking, future carriageway widening, paths and swale drains.

Territory Plan: This Design Standard provides technical support to the Estate Development Code to provide more detailed design requirements for the design of verges in the ACT.

2.1.1.2 Precedence

Where any document except legislation or the Territory Plan issued referenced in this Design Standard includes technical requirements that conflict with this Design Standard, consult with the service authority and TAMS for clarification.

2.1.2 CROSS REFERENCES

2.1.2.1 Commonwealth Legislation

Australian Capital Territory Planning and Land Management Act 1988
Disability Discrimination Act 1992
2.1.2.2 ACT Legislation

Environmental Protection Act 2001
National Capital Plan
Planning and Development Act 2007
Planning and Development Regulation 2008
Public Roads Act 1902
Public Unleased Land Act 2013
Territory Plan 2008 and General Codes
Tree Protection Act 2005
Utilities Act 2000
Utility Networks (Public Safety) Regulation 2001
Work Health and Safety Act 2011

2.1.2.3 Design Standards

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

MIS 01 Street planning and design
MIS 04 Subsurface drainage
MIS 03 Pavement design
MIS 05 Active Travel
MIS 07 Driveways
MIS 08 Stormwater
MIS 10 Guardrails, fences and barriers
MIS 12 Guide signs
MIS 14 Public lighting
MIS 20 Street and park furniture and barbeques
MIS 24 Soft landscape design
MIS 25 Plant species for urban landscape projects

Development Control Code for Best Practice Waste Management in the ACT (ACT No Waste)
Underground services in a shared trench agreement (NBN Co/Telstra/TransACT/ActewAGL)
Water Supply and Sewerage Standards (Actew Water)

2.1.2.4 TAMS Reference Documents

Reference document 4 Protection of public landscape assets
Reference document 6 Design Acceptance submissions
Reference document 7 Operational acceptance submissions
Reference document 8 WAE quality records
Reference document 9 Final acceptance submissions
Reference document 10 Landscape consolidation
2.1.2.5 Design guides

The following ACT design guides are related to this standard:

Bushfire Strategic Management Plan for the ACT, ACT Emergency Services Authority
Canberra Central Design Manual
Development Control Code for Best Practice Waste Management in the ACT (ACT No Waste)
Network Architecture and Technology (NBN)

2.1.2.6 Specifications

General: The following Specifications are related to this standard:

MITS 03 Underground services
MITS 06 Minor concrete works
MITS 07 Segmental paving
MITS 09 Landscape

2.1.3 REFERENCED DOCUMENTS

General: The following documents are incorporated into this design standard by reference:

2.1.3.1 Australian Standards

AS 1742 Manual of uniform traffic control devices
AS 1742.2-2010 Traffic control devices for general use
AS/NZS 2890 Parking facilities
AS/NZS 2890.1:2004 Off-street car parking
AS2890.2-2002 Off-street commercial vehicle facilities

2.1.3.2 Other publications

Nature strip development application Form, TAMS Version 1.1.

Austroads

AGRD03/10 Guide to Road Design - Part 3 – Geometric Design
AGRD06/100 Guide to Road Design - Part 6 – Roadside Design, Safety and Barriers
AGRD06A/09 Guide to Road Design - Part 6A – Pedestrian and Cyclist Paths
AGRD06B/09 Guide to Road Design - Part 6B – Roadside Environment
AGRS09/08 Guide to Road Safety - Part 9 – Roadside Hazard Management
AGTM11/08 Guide to Traffic Management - Part 11 – Parking
2.1.4 STANDARDS

2.1.4.1 Design

Standards:

- General: To AGRD06A
- Paths: To MIS 05

2.1.5 INTERPRETATION

2.1.5.1 Abbreviations

General: For the purposes of this Design Standard the following abbreviations apply:

LMPP: Landscape Management and Protection Plan
TAMS: Territory and Municipal Services, ACT Government and its successors.

2.1.5.2 Definitions

General: For the purpose of this Design Standard, 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.

Other definitions that pertain to this Design Standard are outlined below:

- Block: A parcel of land, whether or not the subject of a lease.
- Domestic driveway: Has the same meaning as in AS 2890.1; namely a driveway serving from
  1 to 3 dwelling units in residential zones and designed for light vehicle traffic only.
- Driveway: Vehicle access across the verge to the block from the edge of the carriageway to
  the property line
- Heavy Duty Driveway: Is a commercial or industrial driveway, or a residential driveway other
  than a domestic driveway, designed in accordance with AS 2890.2.
- Kerb line: Also known as the face of kerb, it is the location on the kerb, kerb and gutter or
  open concrete invert from which the road carriageway width is measured. Refer to ASD3-01
  for actual location for each kerb type.
- Community Path: A path for the joint use of pedestrians and cyclists.
- Module width: The nominal cross-sectional width reserved for a particular service or group of
  services within the verge, measured at the surface level. The module width includes
  consideration for minimum offsets to other services and maintenance access requirements for
  respective authorities.
- Nature strip: refer to verge.
- Shared trench: A trench which is used to accommodate two or more reticulated services.
- Verge: That part of the street reserve between the carriageway and the boundary of adjacent
  blocks (or other limit to street reserve). It may accommodate public utilities, paths, stormwater
  flows, street lighting poles and landscaping including trees.
- Verge width: The distance measured from kerb line to road reserve property line, including
  any indented car parking bays, bus bays or kerb crossing widths.
2.2 PRE-DESIGN PLANNING

2.2.1 CONSULTATION

2.2.1.1 TAMS and other authorities

Requirements: Consult with TAMS and other relevant authorities during the preparation of design. In addition to the requirements of this Design Standard, identify the specific design requirements of these authorities.

Verge works in brownfield areas: Refer to the Nature strip development application Form.

2.2.1.2 Public consultation

Non-statutory consultation: Undertake public consultation on designs if such action is required by the project brief.

Statutory consultation: Conform to the requirements of the Planning and Development Act.

2.2.1.3 Utilities services plans

Existing site conditions: Obtain plans from all relevant utilities and other organisations whose services, trees, important ecological habitats or other assets exist within the area of the proposed development. Plot this information on the relevant drawings including the plan and cross-sectional views. Designs shall include reference to ‘Dial-before-you-dig’ information that is readily available in most areas.

Responsibility: Confirm service plans accuracy with onsite inspection and also potholing if deemed necessary.

2.2.1.4 Safety in Design

Requirement: Implement safety in design processes in accordance with the Work Health and Safety Act.

2.2.1.5 Proposed new services

Requirement: Detail any new services proposed or relocated as part of the proposed works.

2.2.1.6 Protection of existing infrastructure

Requirement: Obtain drawings of existing infrastructure including landscaping within and at the interface to the site. Consult with the asset owners, where this is not covered by the Development Application process, to identify asset protection or relocation requirements.

Submission: Prepare a Landscape Management and Protection Plan (LMPP) for approval by TAMS for temporary accesses or any work within the verge.
2.3 DESIGN CRITERIA

2.3.1 VERGE WIDTH

Requirement: Provide sufficient width within the verge to accommodate all services, tree plantings, paths, landscaping, street furniture and other facilities and conform to the Estate Development Code where applicable. Include consideration for the following:

- Maintenance access for respective authorities.
- Select trees that are appropriate for the verge space on maturity.

2.3.2 VERGE CROSSFALL

There should be sufficient rise from the top of the kerb to ensure that the 100 Year ARI stormwater flow does not encroach onto blocks. Refer to MIS 08.

2.3.2.1 General

General: Changes of grade across the verge should not be so severe that vehicles cannot easily enter block driveways without scraping. In general, because driveways can be located at any location along the verge, the whole verge needs to be designed to suit vehicle access.

Crossfalls in verge: Grade towards the carriageway unless the verge has been designed to convey run-off into open space areas. Conform to the following:

- Desirable minimum: 1 in 50.
- Desirable maximum: 1 in 6.

Paths: Conform to MIS 05.

Driveways: Conform to MIS 07.

2.3.2.2 Crossfall adjacent to kerb

Verges grading away from carriageway: Provide an absolute minimum 2.5 m wide strip adjacent to the kerb grading towards the carriageway at 1 in 50 with consideration for the following:

- Vehicle access to blocks with sufficient changes of grade to prevent scraping.
- Freeboard for stormwater gutter flows.
- An area for wheeled bin placement.
- An area for pedestrian and cycle refuge.
- An appropriate module width for the water main, if required.
- An area for maintenance access to utility services.
2.3.3 WASTE COLLECTION

General: Conform to the requirements in the Development Control Code for Best Practice Waste Management in the ACT.

2.3.3.1 Turning provision

Truck overhang: In brownfield designs, check clearance for waste truck overhang during turning movements. Where required, set back landscaping, facilities and infrastructure to accommodate the overhang of the truck during turning movements. If required, provide a minimum set back of 1.5 m.

2.3.4 EMERGENCY ACCESS

General: Edge roads should be a minimum of 7.5 m wide or provided with indented parallel parking provision. Where the approved carriageway width is less than 7.5 m, provide a minimum hardstand area on the hazard side 1.5 m clear of retaining walls or stone pitched batters.

2.3.5 SERVICES

2.3.5.1 General

General: Design verges to accommodate respective module widths and locations for the required infrastructure. This Standard provides typical module widths for standard residential services at average depths, as summarised in Table 6-1 Infrastructure module widths table. Any deviation from this may require adjusted module widths. It is the designer’s responsibility to confirm appropriate module widths for each asset.

Table 6-1 Infrastructure module widths table

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<tr>
<th>Asset</th>
<th>Module width</th>
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<td>0.35-1.4 m depending on sump type.</td>
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<td>Subsoil drains</td>
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<tr>
<td>Sewer</td>
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</tr>
<tr>
<td>Water</td>
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</tr>
<tr>
<td>Shared trench</td>
<td>1.2 m.</td>
</tr>
<tr>
<td>Non-potable water mains</td>
<td>0.9 m.</td>
</tr>
<tr>
<td>Above ground electrical assets</td>
<td>Varies, module width is for asset location only.</td>
</tr>
<tr>
<td>Street lights</td>
<td>0.6 m.</td>
</tr>
<tr>
<td>Trunk services</td>
<td>Specific to each service. To be individually designed.</td>
</tr>
<tr>
<td>Paths</td>
<td>1.5 – 2.5 m.</td>
</tr>
<tr>
<td>Trees</td>
<td>1.2 m.</td>
</tr>
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</table>
2.3.5.2 Stormwater drainage

Standard: To MIS 08.

Location: Pipes should be located on the low side of the road where sewer mains are located on the high side.

Module width: Align stormwater pipes behind the kerb with minimum widths as follows:

- Including full sump:
  - 1.4 m for sumps located on modified layback kerb (MLBK).
  - 1.2 m for sumps located on kerb other than MLBK.
- Kerb inlet sumps: 0.35 m.

2.3.5.3 Subsoil drains

The required location for the subsoil drain is in front of the kerb.

Standard: To MIS 04.

2.3.5.4 Sewer

Standard: To Water Supply and Sewerage Standards.

Location: Sewer mains should be located on the high side of the road reserve, which permits relatively short connections from adjacent high side blocks. In some streets, it may be necessary to provide sewers adjacent to both road reserve boundaries.

Paths: Sewer mains may be located under the path alignment. Manholes should be either wholly located within the path, or outside the path alignment, to reduce differential settlement.

Module width: Typically 2.0 m, Actew Water may consider or require exceptions where it can be demonstrated that their assets can be accessed within a narrower module or wider module width. Specifically, note the location of sewer depth, gas assets and trees to demonstrate compliance.

2.3.5.5 Water mains

Standard: To Water Supply and Sewerage Standards.

Location: Water mains should be located on the high side of the road reserve to reduce the likelihood of property damage in the event of a burst water main. Locate water mains to be sufficiently clear of the stormwater pipeline to avoid deflection around sumps and to allow adequate clearance to branch valves. When the water main is located on the low side, the full verge width should slope towards the carriageway.

Module width: Typically 0.9 m, Actew Water may consider or require exceptions.

Stormwater: Kerb inlet sumps may be used, to avoid bends in water main pipe alignment.
2.3.5.6  Shared trench services

General: Shared trenching consists of two or more utility services contained within the one trench. This may include:

- High and low voltage electricity cables and pits.
- Street lighting cable.
- Telecommunication/ broadband conduit and pits.
- Gas mains.

Standard: To Underground Services in a Shared Trench Agreement.

Location: The trench centreline should be offset by 900 mm from the property boundary to allow trench excavation and access.

Module width: 1.2 m.

Overlap: The module width allows for the full trench width required. Additional width outside the module is required intermittently to accommodate pits and above ground structures.

Traffic light controllers: Design for Telstra services within shared trench between traffic light controllers in accordance with Roads ACT requirements.

2.3.5.7  Trunk services

General: This module is set aside for bulk supply water mains, high pressure gas mains, trunk stormwater, major telecommunication duct runs, high voltage electricity cables additional to normal capacity. Designers should liaise with the relevant service authorities to determine trunk service reservation requirements. Typically, each authority will require a separate trench and module width.

Telecommunications: These are required by telecommunication carriers for linking exchanges or exchange to development areas. The reservation width provided allows for manholes that are offset to the duct run.

Gas: High pressure (>210 kPa) gas main can share the trench with telecommunication if the route required is the same and future upgrading of the gas main is not required. Otherwise the gas main should be located in a trunk main reservation.

2.3.5.8  Above ground electrical plant and equipment

Overhead electricity: Liaise with ActewAGL regarding any requirements to provide overhead electricity before finalising verge designs.

Electrical plant and equipment: To ActewAGL requirements.

Traffic light controllers: To Roads ACT requirements.

Location: Substations and mini-pillars or power poles should be placed clear of future driveways. Substations shall be kept clear of the driveway sight distance envelope. Conform to MIS07.

Module width: To ActewAGL Cable Plant Separation Requirements (DRG 3832-018).

Overlap: Additional width outside the underground service module width is required intermittently to accommodate above ground service structures such as pad-mount substations and mini-pillars.
2.3.5.9 Street lights

Standard: To MIS14.

Module width: 0.6 m.

Location:
- Clearance to underground services: 0.5 m.
- Typical clearance to kerb: 1.7 m.

2.3.5.10 Curved service alignments

General: Module widths provided in this document and accompanying drawings are the minimum required for a straight street alignment. Services on a curved alignment particularly those, which need to be laid as a series of straight sections will require additional space, and the road reserve should be widened if necessary. Consider the following:
- Length of verge affected.
- The minimum radius at which each service can be laid.
- Any impact for adjoining services.

2.3.5.11 Non Potable Water mains

Standard: To MIS 08.

Location: Non-potable water mains should be located on the high side of the road reserve to reduce the likelihood of property damage in the event of a burst non-potable water main.

Module width: Typically 0.9 m, TAMS may consider or require exceptions.

2.3.5.12 Future services

Reservation modules: Reservation modules for future services are not currently required.

2.3.6 PATHS

2.3.6.1 General

Code: Conform to the Estate Development Code.

Standard: To MIS 05.

2.3.6.2 Location

Location: Provide paths within the verge, where required by the Estate Development Code and the approved Estate Development Plan. Consider the following:
- Provide clearance to the carriageway and from the property line for the safety of all road users.
- Future service repairs to services under paths.
- Avoidance of pits, manholes and sumps partially located within the path to avert potential trip hazards.

Paths are typically located 1.2 m from the property boundary in new residential areas.
Commercial zones: Consider fully paved verges in high pedestrian traffic areas. Consider connecting utilities prior to paving to prevent damage to the finished surface.

2.3.6.3 Clearance from carriageway

Requirement: Provide clearance from:

- Kerbside placement of wheeled bins for collections of household garbage and recycling waste (1 m).
- Opening car doors when cars are parked at the kerb (1.4 m).

2.3.6.4 Clearance from property line

Requirement: Provide clearance between the edge of paths and the property line to ensure clear sight lines to cyclists using the path for a vehicle reversing from a driveway.

Sight distance: Figure 4.5.1. (c) indicates criteria to be considered and shows acceptable minimum clearances for paths fronting residential blocks. Although clean trunk trees are permitted within the sight distance zone, other objects such as substations or low branching trees are not.

2.3.7 TREES

2.3.7.1 General

General: Provide trees within the verge, where required by the Estate Development Code and the approved Estate Development Plan. Consider the tree growth characteristics (including the root zone) in the overall design of the street. Select appropriate species that allow the trees to grow to capacity and maximise the tree life spans.

Species selection: To MIS 25.

Module width: 1.2 m.

Root Barriers: To MIS 25.

Service ties: Service ties are susceptible to tree root intrusion and must be located as far as practical from the root zone. Grouping service ties provides more space for planting and tree development.

Sight lines: Maintain appropriate sight distances, conform to MIS 07.

2.3.8 BUS STOPS AND SHELTERS

Location: Provide bus stops within the verge, where required by the Estate Development Code, the approved Estate Development Plan and ACTION. Consider the following:

- Provide appropriate site distances to driveways and intersections. If required, locally widen verges to ensure that adequate visibility is available.
- Position bus stops and shelters on the departure side of paths.

Standard: MIS 05 and AGRD06A.

2.3.9 TRAFFIC SIGNS

General: Traffic sign placement shall take precedence over other verge infrastructure and landscaping. The shared use of signs and the use of street furniture (e.g. light poles) for the placement of signs should be adopted whenever possible.

Standard: To MIS 12.
2.3.10 MATERIALS

2.3.10.1 Paved areas

Pavement type: Select the pavement type to suit the particular specific or shared function. Refer to MIS 03 for the design of trafficable areas.

2.3.10.2 Non paved areas

All non paved surfaces of verges are to be topsoiled to a depth of at least 100 mm and grassed with an approved dryland grass mix.

2.4 DOCUMENTATION

Requirement: Comply with Requirements for Design Acceptance Submissions.
APPENDIX A GUIDANCE DRAWINGS

Figure 1  Typical section

Figure 2  Typical battleaxe layout
Figure 3  Typical layout