ACT Government

MUNICIPAL INFRASTRUCTURE STANDARDS

Part 2 Earthworks and Site Grading

TCCS
Transport Canberra City Services

September 2021

Publication Number:	MIS 02 Edition 1 Revision 0	
Date of Effect:	APRIL 2019	
Supersedes:	N/A	
Endorsed By:	Karl Cloos	Director, Infrastructure Planning
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Document Information

Document	Key Information
Document Title	Municipal Infrastructure Standards - 02 Earthworks and Site Grading 1 0
Next review date	
Key words	
AUS-SPEC Base Document	0021 Site regrading

Revision Register

Edition/ Revision Number	Clause Number	Description of Revision	Authorised By	Date
1/0				

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1 EARTHWORKS AND SITE GRADING

1.1 General

1.1.1 Responsibilities

1.1.1.1 General

General: Provide design and documentation of earthworks for municipal streets and for residential, industrial and commercial building allotments and urban open space areas.

1.1.1.2 Objectives

Objectives: Provide designs for earthworks that include consideration for the following:

- Provide an efficient and economical design with safe conditions for construction.
- Enhance the environment of the site whilst maintaining the site's natural features.
- Minimise impact on adjoining properties and other works.
- Maintain or improve drainage and overland flow paths.
- Minimise the risk of soil erosion.

1.1.1.3 Precedence

Where any document except legislation or the *Territory Plan* issued in conjunction with this Design Standard includes technical requirements that conflict with this Design Standard the requirements of this Design Standard take precedence.

1.1.2 Cross references

1.1.2.1 Commonwealth Legislation

The following Commonwealth Legislation is relevant to this Standard:

Disability Discrimination Act

Environment Protection and Biodiversity Conservation Act

1.1.2.2 ACT Legislation

The following ACT Legislation is relevant to this Standard:

Environment Protection Act

Heritage Act

Lakes Act

Water Resources Act

Waste Minimisation Act

Territory Plan and related Codes

Work Health and Safety Act

1.1.2.3 ACT Government Strategic Documents

ACT Weed Strategy 2009-2019

1.1.2.4 Design Standards

This Design Standard references the following component standards:

MIS 06	Verges
MIS 07	Driveways
MIS 08	Stormwater
MIS 16	Urban open space
MIS 24	Soft landscape design

Water Supply and Sewerage Standards (Icon Water):

WSA-02	Gravity Sewerage Code of Australia (WSAA)
WSA-03	Water Supply Code of Australia (WSAA)
STD-SPE-G-011	Supplement to WSA-02 2014 (Icon Water)
STD-SPE-G-012	Supplement to WSA-03 2011 (Icon Water)
STD-SPE-M-006	Requirements for property service connections and water meters

1.1.2.5 Specifications

The following Specifications are related to this standard:

MITS 01	Traffic Management
MITS 02	Earthworks
MITS 08	Incidental works

1.1.2.6 TCCS Reference Documents

The following TCCS reference documents are related to this standard:

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

1.1.2.7 Design guides

The following design guides are related to this standard:

Development Control Code for Best Practice Waste Management in the ACT (ACT No Waste)

Environment Protection Guidelines for Construction and Land Development in the ACT (EPA)

1.1.3 Referenced documents

General: The following documents are incorporated into this Design Standard by reference:

1.1.3.1 Standards

AS 3798 Guidelines on earthworks for commercial and residential developments

AS 4970 Protection of trees on development sites

1.1.3.2 Other publications

Austroads

AGPT Austroads Guide to Pavement Technology

AGPT08 Part 08: Pavement construction

AGRD Austroads Guide to Road Design

AGRD07 Part 07: Geotechnical investigation and design

Institute of Public Works Engineering

IPWEA Local Government Salinity Management: a resource guide for the public works professional.

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

1.1.4 Interpretations

1.1.4.1 Abbreviations

General: For the purposes of this design standard, the following abbreviations apply:

ARI: Average recurrence interval.

CEMP: Construction Environmental Management Plan

EMP: Environmental Management Plan

EPA: ACT Environment Protection Authority, ACT Government, and its successors

EPBC Act: Environment Protection and Biodiversity Conservation Act 1999

ESCP: Erosion and Sediment Control Plan.

LMPP: Landscape Management and Protection Plan

NTU: The units of turbidity from a calibrated nephelometer are called Nephelometric Turbidity Units.

PACS: Parks and City Services, ACT Government, and its successors

TCCS: Transport Canberra and City Services, ACT Government, and its successors

TTM: Temporary Traffic Management

VENM: Virgin Excavated Natural Material

1.2 Pre-design planning

1.2.1 Consultation

1.2.1.1 TCCS and other Authorities

Requirements: Consult with TCCS and other relevant Authorities during the preparation of design.

Haul routes: To *MITS 01 Traffic Management*. Identify an appropriate route between the site and the arterial road network as part of a concept TTM plan. Consult with TCCS to define acceptable routes for haulage with applicable load limits if required.

Tree preservation: Consult with TCCS relating to tree protection for clearing of the site. Refer also to *MIS 06 Verges* and *MIS 16 Urban Open Space.*

1.2.1.2 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. As a minimum, designs should refer 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. Protect existing assets to the satisfaction of asset owners.

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

1.2.1.3 Safety in Design

Requirement: Implement safety in design processes in accordance with the *Work Health and Safety Act*. Include consideration for the following:

- The potential for flooding.
- Haul routes and traffic management.
- Stockpile location and stability.
- Identification and protection of existing services.
- Maintenance operations such as mowing or traversing batters.

1.2.2 Planning

1.2.2.1 Site suitability

Improvement: The natural state of a site may not be suitable for the intended function. Site regrading may be required to:

- Alleviate flooding.
- Fill gullies or create emergency flow paths after installation of underground stormwater systems.
- Improve stormwater runoff.
- Reduce excessively steep slopes, to allow construction of economical foundation solutions.
- Allow effective recreational use or provide improved access.
- Fill local unwanted depressions.
- Improve ground conditions in areas where existing soils have plastic/reactive properties.

Contours: Review the natural surface contours and design finished surface levels to confirm land will be suitably prepared for use.

1.2.2.2 Performance

Requirement: Conform to *Estate Development Code*, including the following:

- General earthworks: *Clause 5.3*
- Tree protection: *Clause 5.4*
- Compact blocks: *Clause 8.2*
- Industrial zones: *Clause 12.2*
- Block compliance: *Appendix A*

2 EARTHWORKS DESIGN

2.1 General

2.1.1 Considerations

Environment: Consider the implications of site regrading for the existing environment. Minimise site regrading in heavily vegetated areas.

Watercourses and riparian zones: Design site regrading Works that preserve and do not degrade existing watercourses and riparian zones where possible.

Haulage: Design areas for site regrading in conjunction with the road design, with the objective of balancing cut to fill, achieving an economical design, reducing geotechnical risks and minimising the haulage of imported fill or spoil.

Existing soil conditions: Evaluate existing soil conditions by geotechnical investigations to determine:

- Soil and rock strength and physical properties.
- Extent of any previously filled areas.
- Maximum and desirable batter slopes for cuttings and embankments.
- Special geotechnical design treatments likely to be required.
- Expected bulking factors, refer also to AGRD07, clause 4.3.2.

Adjoining Land Owners: Obtain agreement from adjoining property owners prior to carrying out any construction work on their property.

2.2 Drainage and runoff

2.2.1 General

Standard: To *MIS 08 Stormwater.*

Underground drainage: Regrade areas to minimise the need for surface inlet pits and, where practical, allow surface water to flow naturally to roads or drainage reserves without excessive concentration.

Overland flow: Provide depressions at low points and over major drainage lines, refer to *MIS 08 Stormwater*. Do not direct concentrated overland flows into leased land.

Ground water: In areas known to be affected by ground water flows, investigate the existing conditions as they relate to the proposed Works. Recommend any contour adjustments in accordance with *MIS 08 Stormwater* and geotechnical advice.

2.2.2 Level requirements

Areas abutting 100 year ARI flood levels: Regrade to a minimum level above the 100 year ARI flood levels in accordance with *MIS 08 Stormwater*. Do not cause flooding of other areas as a consequence of such regrading.

Building areas: Regrade in the direction of the catchment area drainage system as follows:

- Desirable surface grading: 1.5%.
- Minimum surface grading: 1.0%.

Piped gullies or depressions: Design finished surface levels of piped gullies or depressions to provide adequate cover depth over pipelines (if piped) and direct surface stormwater flow to inlet pits.

2.2.3 Diversion drains

Drawings: Identify the location of any temporary or permanent cut-off or diversion drains required to divert surface flows away from the regraded and re-vegetated areas, including any erosion or sedimentation control treatment. Size drains to accommodate the volume of water to be diverted.

2.2.4 Erosion and sedimentation control

Objective: Minimise topsoil disturbance and material loss off site.

Requirements: Conform to *Environment Protection Guidelines for Construction and Land Development* in the ACT.

Temporary erosion and sedimentation control ponds: Where the pond is designed for the bulk earthworks construction period, to *MITS 02C Stabilisation.*

Long term erosion and sedimentation control ponds: Where the pond is designed beyond the earthworks construction period, to *MIS 08 Stormwater*.

Permanent water quality and control ponds: To *MIS 08 Stormwater.*

2.3 Block grading and levels

2.3.1 Grading requirements

General: Set block and road levels to housing product requirements in accordance with developer instructions. Grade blocks to fall towards the road where possible to reduce the need for service easements within leased land.

Minimum grade: To **Drainage and runoff.**

Steep building areas: For building areas with natural ground slopes greater than 15% obtain confirmation of the compatibility of the proposed works from a geotechnical engineer. Document any specific design implications.

2.4 Site works

2.4.1 General

Specification: To *MITS 02B Bulk earthworks*.

Slope stability: Provide appropriate stabilising treatments or retaining walls as required by the site conditions with consideration for access and maintenance requirements.

2.4.2 Trees

Removal: Document the removal of trees approved to be removed.

Preservation: Document approved preservation measures for selected trees, to prevent destruction caused by placement of fill or any other action within the tree drip zone. Refer to *AS 4970* and *MIS 24 Soft Landscape Design* for further guidance.

2.4.3 Earthworks and Site Grading

Municipal Roads: To AGRD07, Section 4 Design Elements as applicable to municipal roads.

Verges: To *MIS 06 Verges*.

Blocks and Open Space Areas:

- Conform to requirements of *AS3798* and *AS2870*.
- Determine areas of general fill and controlled fill to be placed within blocks or open space areas.
- Determine from geotechnical investigation areas of uncontrolled fill and document proposed treatment.

Specification: To *MITS 02B Bulk earthworks*.

2.4.4 Top dressing

Topsoil management: To *MITS 02 Earthworks* and the site CEMP, if applicable.

Landscaping: Document dressing of all areas where fill will be placed, with clean arable topsoil, fertilised and sown with suitable grasses. Conform to *MIS 24 Soft Landscape Design*.

Re-use: If possible, retain and ameliorate existing topsoil and replace topsoil at the completion of the works in the same location.

2.4.5 Retaining walls

Boundary: Design retaining walls to sit wholly inside our outside a block boundary.

Design: Use an appropriately qualified and experienced structural engineer to design and certify all retaining walls.

Adjacent services: Design wall so that no imposed loads are applied directly to adjacent service infrastructure and that services are located outside the zone of influence of the wall. Do not encroach on or restrict maintenance access to any service easements. Refer also to Water Supply and Sewerage Standards.

Specification: To *MITS 08 Incidental works*.

Drawings: *ACTSD-0901 Gravity retaining walls* and *ACTSD-0902 Reinforced concrete block walls*.

3 DOCUMENTATION

Requirements: Comply with *Reference document 6 Design Acceptance submissions.*

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