



ACT
Government

CLEARING & GRUBBING 02A

MUNICIPAL
INFRASTRUCTURE
TECHNICAL
SPECIFICATION
02 - EARTHWORKS

Transport Canberra and
City Services

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1 CLEARING AND GRUBBING

1.1 General

1.1.1 Responsibilities

1.1.1.1 Objectives

Requirement: Provide for the clearing and grubbing of vegetation, both alive and dead, stumps, roots, scrub, removal of all existing built structures,(such as fences, gates and livestock yards), all rubbish, rocks, boulders and other materials which are unsuitable for use in the works, to allow site works for roadwork and block construction to conform to the Drawings as documented.

1.1.2 Cross references

General: The following documents are related to this Specification:

1.1.2.1 Commonwealth Legislation

Aboriginal and Torres Strait Islander Heritage Protection Act

Environment Protection and Biodiversity Conservation Act

1.1.2.2 ACT Legislation

Environmental Protection Act

Heritage Act

Lakes Act

Nature Conservation Act

Pest Plants and Animals Act

Public Unleased Land Act

Tree Protection Act

Water Resources Act

Waste Minimisation Act

Work Health and Safety Act

1.1.2.3 Specifications

Requirement: Conform to the following:

MITS 00 Preliminaries

MITS 01 Roadwork

MITS 03 Underground services

MITS 04 Flexible pavement construction

1.1.2.4 Design Standards

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

MIS 02 Earthworks and site grading

1.1.2.5 TCCS reference documents

General: The following TCCS reference documents are related to this Specification:

- Reference Document 4 Protection of public landscape assets
- Reference Document 6 Design Acceptance submissions
- Reference Document 7 Operational acceptance submissions
- Reference Document 8 Works as executed quality records
- Reference Document 9 Final Acceptance submissions
- Reference Document 10 Landscape consolidation
- Reference Document 11 Drafting Standard for Civil and Landscape works

1.1.3 Referenced documents

1.1.3.1 Standards

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

Australian standards

- AS 1473.1 Wood-processing machinery – safety Part 1: Primary timber milling machinery.
- AS 1744 Forms of letters and numerals for road signs (known as Standard alphabets for road signs).
- AS 4373 Pruning of amenity trees.
- AS/NZS 4671 Steel reinforcing materials.

1.1.3.2 EPA reference documents

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

1.1.3.3 Environment protection and biodiversity conservation

Matters of National Environmental Significance are to be protected as per the approvals and conditions set by the Commonwealth or the ACT Government.

- HB 294 National post-border weed risk management protocol

1.1.4 Standards

1.1.4.1 General

Standard: To AS 4373.

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

1.1.5 Interpretation

1.1.5.1 Abbreviations

General: For the purposes of this Specification the following abbreviation applies:

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

EPBC Act: Environment Protection and Biodiversity Conservation Act

LMPP: Landscape Management and Protection Plan

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

TPZ: Tree Protection Zone

TMP: Tree Management Plan

1.1.5.2 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:

Authorised Person: The Authorised Person as defined by the contract.

Drip zone (of a tree): The area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.

Landscape Management and Protection Plan (LMPP): Is a drawing with detailed notes that describe assets on Road Reserves, street verges, public open space and unleased territory land adjacent to development.

Open drains: All drains other than pipe and box culverts and include catch drains, channels (gutters) and kerbs and channels (gutters).

Regulated Tree: Refer to the *Tree Protection Act*.

Tree Protection Zone: The area under, or within 2m of the tree canopy.

1.1.6 Hold points and witness points

1.1.6.1 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 2A-1 Hold point table

Item	Clause title	Requirement	Notice for inspection	Release by
Execution				
2A.1	Limits of clearing - Extent of clearing	Submit extent of clearing survey plan and identify the perimeter of the area on site.	3 working days before proposed commencement of clearing	Authorised Person
2A.2	Environment to be preserved - Tagging	Confirm clearing perimeters and mark trees to be preserved	3 working days before proposed site clearing	Authorised Person
2A.3	Tree protection - General	Any excavation within the TPZ of protected trees has an approved LMPP/TMP.	3 working days before proposed excavation	Authorised Person
2A.4	Tree protection - Fencing	Tree protection fencing installed according to approved LMPP/TMP.	3 working days before proposed site clearing	Authorised Person
2A.5	Tree protection - Timber falling on private property	Written consent from the owner to leave in place or to enter property to remove	Prior to carrying out works	Authorised Person
2A.6	Tree Protection - Damage	Approval for any rehabilitation of vegetation or fauna habitat	3 working days prior to carrying out works	Authorised Person

Table 2A-2 Witness point table

Item	Clause title	Requirement	Notice for inspection
Execution			
2A.1	Weed Control - Procedures	Persons involved in spraying must have a current pesticide operations licence.	Authorised Person
2A.2	Environment to be preserved - Trees to be preserved	Exclusion zone around protected trees	Progressive
2A.3	Tree protection - General	Tree's and roots not to be cut or damaged without prior approval	Progressive
2A.4	Grubbing - Backfill	Backfill and compact grub holes	Progressive
2A.5	Treatment of cleared vegetation – Stockpiling of cleared vegetation	Stockpile location approval	Prior to stockpiling
2A.6	Disposal of Materials – General	Maintain Records of all material removed from site	Progressive

1.2 Pre-construction planning

1.2.1 General

1.2.1.1 Weed management

- > Chemically treat or manually remove weeds before commencing work, where appropriate.
- > Avoid the movement of people and machinery through weed infested areas where possible.
- > Determine the method of cleaning vehicles, machinery and personnel by either water or air as appropriate.
- > Select an appropriate cleaning bay location.
- > Clean equipment before entry to and exit from the site.
- > Monitor vehicle entry and exit points for weeds on vehicles and machinery.
- > Stockpile material contaminated with weeds separately.
- > Train all site personnel in the identification of relevant weeds and machinery hygiene requirements.

1.3 Execution

1.3.1 Provision for traffic

Requirement: Conform to *MITIS 01 Traffic Management*.

1.3.2 Site establishment

1.3.2.1 Survey

Requirement: Verify existing ground surface profile and benchmarks. Conform to *MITIS 00 Preliminaries*.

1.3.2.2 Erosion and Sediment Control

Requirement: Provide appropriate erosion and sediment control measures prior to commencing work. Conform to *MITIS 00C Control of erosion and sedimentation*.

1.3.2.3 Excavation near underground services

Utility service location and protection: To *MITIS 00A General requirements*.

1.3.3 Limits of clearing

1.3.3.1 Extent of clearing

Clearing: Extent of clearing for the works is as indicated on the Drawings or Schedules and also includes areas that will be occupied by:

- > The completed works.
- > Erosion and sedimentation measures.
- > Stockpile sites and borrow areas.
- > A clearance zone of 4m beyond tops of cuts and toes of batters where the natural fall of the ground is towards the site.
- > A clearance zone of 2m beyond the tops of cuts and toes of batters where the natural fall of the ground either slopes away from the site or is level.
- > Clearing the site includes but is not limited to the removal of organic matter identified as trees, log stumps, roots and vegetation and the removal of foreign material identified as concrete, masonry, boulders, fences, structures, slabs, rubbish and any other deleterious material identified by the Authorised Person.

Planning and programming: Clearing is to be carried out progressively with only the minimum area of land left disturbed at any time. Ensure that only the absolute minimum area for construction is cleared.

Trees outside limits of work: Plan all operations to ensure that there is no damage to any trees outside the extent of clearing specified or approved.

Natural landscape features: Protect against disturbance of any natural rock outcrops, natural vegetation, soil and water courses outside the limits of clearing.

1.3.3.2 Survey

Submission: Submit a survey plan and physically identify the proposed extent of clearing prior to commencement to confirm the clearing perimeters.

This is a **HOLD POINT**.

1.3.4 Grubbing

1.3.4.1 General

Extent of grubbing: All stumps and roots over 50mm in diameter within the extent of clearing which are unable to be felled and removed. If tree removal is within a limited area and disturbance to surrounding area is unacceptable, the grinding of tree stumps shall be to 0.3m below surface may be approved by the Authorised Person.

Depth of grubbing: Carry out grubbing operations to a depth of 0.5m below the natural surface or 0.5m below the subgrade where applicable in road areas. In areas of controlled fill, undertake grubbing operations to a depth specified by the geotechnical engineer.

1.3.5 Weed control

1.3.5.1 Procedures

General: The contractor is required to control all environmental weeds within the site for the duration of construction and handover phases. The contractor shall remove weeds where directed by the Authorised Person.

Implementation: Avoid spreading weeds during the clearing operations and remove all identified weeds as a separate operation.

Spraying: All persons engaged in spraying to have a current pesticide operator's licence as issued by TCCS.

This is a **WITNESS POINT**.

1.3.6 Environment to be preserved

1.3.6.1 Tagging

Program: Implement protective measures before commencement of clearing in accordance with the approved Landscape Management Protection Plan (LMPP).

Inspection: The Authorised Person and TCCS will inspect the proposed area for clearing to confirm the clearing perimeters and mark with ribbon markers, or indicate to the Contractor the trees, other vegetation and environmental areas to be preserved or elements to be transplanted.

This is a **HOLD POINT**.

1.3.6.2 Work near trees noted for protection

Exclusion zone: The area within the TPZ of trees that are tagged to be protected is to be an exclusion zone. The following activities must not occur within this zone unless prior approval has been received:

- > Erection of structures.
- > Excavation and filling.
- > Changes to soil profiles.
- > Stockpiling of spoil.
- > Storage of other materials.
- > Driving or parking of any vehicle or machinery.
- > Removal or addition of topsoil/soil

This is a **WITNESS POINT**.

Harmful materials: Do not place soil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.

Parking of Vehicles: Do not park / store any plant, equipment or vehicles within 2 m of the tree canopy.

1.3.6.3 Transplanting

Method: The lifting and temporary storage of the nominated vegetation for transplanting to conform to MITS 09 Landscape.

1.3.6.4 Excavation within TPZ

Requirement: Work within the TPZ shall be in strict accordance with an approved Tree Management Plan or LMPP. No works shall be carried out where approval has not been granted.

Open excavations: Work methods should minimise the time period an excavation is left open under tree canopies.

Hand work: Work within 2 m of the canopy of trees to be protected shall be carried out by hand or other approved method to avoid damage by equipment, and in accordance with an approved TMP/LMPP.

1.3.6.5 Pedestrian and traffic considerations

Where a constructed footpath or cycle way exists within the verge, protective fencing must in all cases be set back 0.6m from each side of footpath / cycleway to ensure safe passage for cyclists and pedestrians.

If there is no constructed footpath on the verge a fenced clearway of 1.8m in width must be maintained for the entire frontage of the lease to allow for pedestrians and cyclists.

Access gates into the site must swing into the site. They must not be capable of blocking pedestrian access along the verge or vehicular traffic on the road.

1.3.7 Tree protection

1.3.7.1 General

Temporary tree protection fencing enclosures shall be installed in accordance with an approved TMP/LMPP. As a minimum protection fencing is to be installed 2m from the tree canopy. Groups of trees are to be enclosed as groups

Damage prevention: Any excavation inside the TPZ shall be in accordance with an approved LMPP/TMP.

This is a **HOLD POINT**.

Trunk protection: If space is not available for tree protective fencing enclosures, trunk protection comprising 2000mm long planks of 100mm x 50 hardwood stacked vertically around the trunk and secured with 10 gauge wire over hessian protective padding, may be acceptable if approved within the LMPP/TMP.

Sheeting to excavations: Where excavations are to be made near trees, add continuous 900 mm high corrugated galvanized steel sheeting, bedded 150 mm into the ground, wired to the enclosure.

Damage: Prevent damage to tree bark and root system. Do not attach stays and guys to trees. If any tree is damaged during the course of the work, the Authorised Person may direct the Contractor to effect repairs or remove and replace the tree. Alternatively, the Authorised Person may make arrangements for repair or replacement at the Contractor's expense. Damage to trees shall also include damage to bark and root systems.

Non-mechanical methods: Use non-mechanical or hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.

Clearing machines: Fit machines used for pushing and heaping operations with root takes or similar and operate to make sure as little soil as possible is removed and heaped with the cleared vegetative material.

Roots: Do not cut tree roots within 2m of the tree canopy unless in accordance with an approved TMP/LMPP. Where approved;

- > Do not cut roots exceeding 30mm diameter measured at a distance of three (3 metres from the tree trunk without prior approval from the Authorised Person.
- > Use means of cutting that do not unduly disturb the remaining root system.
- > Cut roots neatly in the line of the work before commencing machine excavation.
- > All cut surfaces shall be coated with a suitable bitumen based paint. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots (e.g. Formula 20® or Hormone 20®).

This is a **WITNESS POINT**.

1.3.7.2 Protective fencing

Temporary Tree protection fencing is to be installed to protect the areas identified for protection.

Fencing must be erected before the commencement of any site works and only removed at completion of all construction. The fence is to remain continuous throughout the project. Fencing of areas to be restored or rehabilitated may be removed at commencement of the restoration with the approval of the Authorised Person.

The protective fencing is to be 1800mm tall continuous mesh fence supported by steel posts with concrete bases unless other fencing has been approved by the relevant authority.

This is a **HOLD POINT**.

1.3.7.3 Reinstatement for protected trees

Backfill material: Backfill around tree roots must be a mixture consisting of three parts by volume of topsoil and one part of well-rotted compost. The compost is to have a neutral pH value, free from weed growth and harmful materials.

Backfill layers: Backfill layers to be each of 300mm maximum depth.

Compaction of backfill: Place layers of backfill by hand or other approved method and compact to a dry density similar to that of the original or surrounding soil.

Backfill height: Do not backfill around tree trunks to a height greater than 200mm above the original ground surface.

Watering: Water trees as necessary, including where roots are exposed at ambient temperature greater than 35°C. Thoroughly water the root zone surrounding the tree immediately after backfilling.

Compacted ground: Do not compact the ground or use skid-steel vehicles under the tree drip line. If compaction occurs, give notice and obtain instructions from the approved person.

Consolidation: Refer to *MITS 09 Landscape*.

1.3.7.4 Trees within proposed earthwork areas

Notice: Give notice immediately where a tree marked for preservation is located within an area proposed for cut or fill. The Authorised Person will decide in accordance with approved plans in consultation with TCCS whether the tree is to be removed or protected.

1.3.7.5 Unsound trees within limit of contract

Clearing: The Authorised Person will seek approval from TCCS to clear any unsound tree remaining within the limit of contract but outside the limits of clearing that is likely to fall upon the site, roadway, future dwellings, paths, cycleways etc.

Disposal: Dispose of any unsound trees and over hanging branches to conform to **Treatment of Cleared Vegetation**.

1.3.7.6 Timber falling on private property

Prevention: Take every precaution to prevent timber from falling on private property at all times.

Owners consent: If timber does fall on private property obtain written consent from the property owner for it to remain there or approval to enter the property and remove it for disposal. Submit the owner's written consent.

This is a **HOLD POINT**.

1.3.7.7 Damage

Restoration: Make good damage of any kind, including damage to trees or fencing, occurring during clearing operations and construction.

Rehabilitation: Any damage caused by the Contractor to trees must be rehabilitated in consultation with a licensed arborist. Any damage to other vegetation, landforms or fauna habitat must be rehabilitated in consultation with a registered landscape architect. Report all damage to Authorised Person immediately. Restore to the pre-existing condition within the shortest period of time.

This is a **HOLD POINT**.

Methods: This may include but is not limited to deep ripping or hand scarifying and raking of wheel tracks and compacted soil, reinstatement of rocks or stones, planting of seeds or seedlings together (including ongoing maintenance), repairs to foliage or root systems of trees and shrubs and reinstatement of fauna habitat.

1.3.7.8 Backfill

Backfill holes: To prevent the infiltration and ponding of water immediately backfill holes or depressions remaining after trees and stumps have been grubbed with soil material similar to the adjacent ground. Where the backfill is not within a future residential, commercial or industrial block, compact the backfill material to the density of the existing material in the adjacent ground. Where the backfill is within a future residential, commercial or industrial block, compact the backfill material as per the requirements of Controlled Fill as detailed in this specification.

This is a **WITNESS POINT**.

1.3.8 Treatment of cleared vegetation

1.3.8.1 Fauna habitat

General: Retain tree trunks and stone features for fauna habitat where specified in the Drawings.

Large tree trunks: Cut any tree trunks nominated for salvage as fauna habitat logs into transportable logs not less than 3.4m in length and move to secure site for storage and later placement.

Landscape stone features: Remove any stone features nominated for salvage as fauna habitat and store in secure TCCS site for later placement.

1.3.8.2 Woodchip mulch

Woodchip mulch: Produce woodchip mulch derived from crowns of trees and branches of shrubs cleared under this Specification, where specified in the Drawings.

Dimensions of woodchip mulch: Produce the wood-chip mulch from branches having a maximum diameter of 100 mm and the chipped material produced is not to have two orthogonal dimensions exceeding 75mm and 50mm.

Timing: Chip cleared vegetation within 7 days of clearing to avoid excessive drying out of the vegetation and loss of seed stock.

1.3.8.3 Stockpiling of cleared vegetation

Landscaping: Stockpile the woodchip mulch for subsequent use in landscaping to conform to *MITS 09 Landscape* or for use at other locations as directed.

This is a **WITNESS POINT**.

Mixing: Unless specified otherwise, the mixing of cleared vegetation into the existing topsoil occurs during the topsoil operations and prior to the removal and stockpiling.

Avoid contamination: Stockpiles of vegetation must be free from stones, soil, rubbish and other materials and not be contaminated with matter toxic to plant growth.

Shape: Stockpiles of chipped vegetation 5m bottom width, 2.5m high, batter 1 H: 2 V.

Weed free: Maintain weed free vegetation stockpile sites for the duration of the stockpiling period. Treat weeds as many times as necessary to control the weed species.

Location: Locate stockpile sites away from drainage lines and position to allow ease of transport of materials at any time. Stockpiles must not impinge on driver's sight lines or affect road safety.

Rehabilitation: Rehabilitate stockpile sites to conform to *MITS 09 Landscape*.

1.3.9 Disposal of materials

1.3.9.1 General

Removal from site: Unless otherwise specified elsewhere in this Specification, or on the Drawings, all materials cleared and grubbed become the property of the Contractor and are to be removed from the site and disposed of legally by the Contractor. The Contractor shall maintain records of all material removed from site.

This is a **WITNESS POINT**.

Burning of material is not permitted on site.

2 MEASUREMENT AND PAYMENT

2.1 Measurement

2.1.1.1 General

Payments made to the Bill of Quantities: To *MIT'S OOA General Requirements*, this Specification, the *Drawings* and **Pay items**.

2.1.1.2 Methodology

The following methodology will be applied for measurement and payment:

- > Allow for all work, materials, testing and quality assurance requirements in each Pay Item.
- > Erosion and sedimentation control measures are measured and paid in accordance with *MIT'S OOC Control of erosion and sedimentation*.

2.2 Pay items

Table 2A-3 Pay items table

Item No	Pay items	Unit of measurement	Schedule of rates scope
2A.1	Clearing and grubbing	Lump Sum	All activities associated with clearing and grubbing including removal and disposal of unregulated trees.
2A.2	Removal of Regulated trees	Number of trees	All activities associated with removal and disposal of nominated regulated trees, including grubbing of roots, backfill and compaction of grub holes.
2A.3	Removal of nominated trees	Number of trees	All activities associated with removal and disposal of nominated retained trees requiring removal subsequent to completion of clearing and grubbing operations including grubbing of roots, backfill and compaction of the grub holes.
2A.4	Wood-chipping	Cubic metres in stockpile	All activities associated with wood-chipping where required within the Contract, including stockpiling within the limits of the contract, management of the stockpile until the material is reused / removed or for the duration of the contract.
2A.5	Tree Surgery	Provisional Sum	All activities associated with the engagement and management of an approved tree surgeon and undertaking tree pruning to the satisfaction of the project Landscape Architect.
2A.6	Landscape Management and Protection Plan	Lump sum	All activities associated with works necessary to protect publicly owned landscape assets adjoining the site in accordance with the approved Landscape Management and Protection Plan. This pay item includes all costs associated with the supply and erection of protection measures as documented, including maintenance and relocation during construction and removal on completion of works. This pay item also includes any specified restoration works.



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