

1111 CLEARING AND GRUBBING

1 GENERAL**1.1 RESPONSIBILITIES****Objectives**

General: Provide clearing and grubbing of vegetation to allow site works for roadway construction to conform with drawings, permits, vegetation clearing schedules as documented.

Performance

Requirements: Provide cleared land, remove and dispose of all rubbish and materials unsuitable for subsequent works as shown on the drawings and directed by the Superintendent.

~~Requirements: [complete/delete]~~

~~Authority requirements: [complete/delete]~~

1.2 CROSS REFERENCES**General**

Requirement: Conform to the following:

- 0136 General requirements (Construction).
- 0152 Schedule of rates – supply projects.
- 0161 Quality (Construction).
- 0167 Integrated management.
- 0257 Landscape – roadways and street trees.
- 1101 Control of traffic.
- 1102 Control of erosion and sedimentation.
- 1195 Boundary fences for road reserves.

1.3 REFERENCED DOCUMENTS**Standards**

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

AS 1473.1-2000	Wood-processing machinery – safety Part 1: Primary timber milling machinery
AS 1744-1975	Forms of letters and numerals for road signs (known as Standard alphabets for road signs).
AS 4373-2007	Pruning of amenity trees.
AS/NZS 4671: 2001	Steel reinforcing materials.

1.4 STANDARDS**General**

Standard: To AS 4373.

1.5 INTERPRETATION**Abbreviations**

General: For the purposes of this worksection the following abbreviation apply:

CTPO: Council's Tree Preservation Officer.

Definitions

General: For the purposes of this worksection the following definition apply:

- Council: Local Government and/or authority having responsibility for the area to be affected by the works.
- Environmental officer: Council appointed person authorised to determine specific environmental matters.

1.6 SUBMISSIONS

Approval

Submissions: To the Superintendent's approval.

Documents

Submit the following for approval:

- Weed management plan as noted in **Pre-construction planning**.
- Drawings: Showing area of work completed at the time of each progress claim.
- Calculations: Confirmation of areas or units claimed for 'Execution.'
- Execution details: Method statements for selective clearing and proposed equipment.
- Technical data: Survey diagrams to record set out results.

1.7 HOLD POINTS AND WITNESS POINTS

Notice

General: Give notice so that the documented inspection and submissions may be made to the **HOLD POINT table** and the **WITNESS POINT table**.

HOLD POINTS table

Clause/subclause	Requirement	Notice for inspection	Release by
EXECUTION			
Limits of clearing			
Survey	Decision on the removal of miscellaneous items	7 days before proposed removal	<i>Principal Certifying Authority</i>
Extent of clearing	Submit peg out and extent of clearing survey	7 days before proposed commencement of clearing	<i>Principal Certifying Authority</i>
Trees to be preserved			
Tagging	Confirm clearing perimeters and mark trees to be preserved	7 days before proposed site clearing	<i>Principal Certifying Authority</i> and CTPO
Work near trees noted for protection	Work method statement for works within the exclusion zone	7 days before proposed works	<i>Principal Certifying Authority</i> and CTPO
Excavation within 4m of tree trunks	Develop appropriate work methods to avoid damage to the tree for approval	7 days before proposed excavation	<i>Principal Certifying Authority</i> and CTPO
Trees within proposed embankment areas	Direction to remove or protect trees within proposed embankments	7 days before proposed site clearing	<i>Principal Certifying Authority</i> and CTPO
Unsound trees in road reserve	Direction on removal of trees or branches not within the clearing limits	7 days before proposed site clearing	<i>Principal Certifying Authority</i> and CTPO
Timber falling on private property	Written consent of owner to leave in place or to enter property to remove	Prior to carrying out works	<i>Principal Certifying Authority</i>
Damage	Approval for any rehabilitation of vegetation or fauna habitat	3 working days prior to carrying out works	<i>Principal Certifying Authority</i>

Clause/subclause	Requirement	Notice for inspection	Release by
Grubbing			
Blasting	Explosives not permitted without prior approval	Progressive	<i>Principal Certifying Authority</i>
Disposal of materials			
Burning of material	Approval prior to disposal of timber and other combustible materials by burning	Prior to burning	<i>Principal Certifying Authority</i>

WITNESS POINTS table – On site activities

Clause/subclause	Requirement	Notice for inspection
EXECUTION		
Existing Utility services - Marking	Locate all underground pipe and cables	Before commencing any earthworks
Weed control - Procedures	Tag all areas identified in the Weed Management Plan	7 days before commencing works
Trees to be preserved – Work near trees noted for protection	Exclusion zone around protected trees	Progressive
Trees to be preserved – Tree protection	Tree's and roots not to be cut or damaged	Progressive
Grubbing - Backfill	Backfill and compact grub holes	Progressive
Chipping of cleared vegetation - Stockpiling	Stockpile location approval	Prior to stockpiling

2 PRE-CONSTRUCTION PLANNING

2.1 WEED MANAGEMENT PLAN

Content

Details required:

- Identification of weeds and infestation zones within the work site/investigation date.
- Method of cleaning vehicles and machinery, and cleaning date.
- Cleaning bay location and treatment date.
- Contaminated fill stockpile, treatment type and treatment date.

2.2 ESTABLISHMENT

Survey: Provide a qualified survey team to prepare site plans and carry out pegging.

Program: Provide planning resources to allocate plant and personnel for the contract period.

Control measures: In advance or in conjunction with clearing and grubbing operations implement adequate measures in accordance with *1102 Control of erosion and sedimentation*.

3 EXECUTION

3.1 EXISTING UTILITY SERVICES

Marking

Location: Before commencing earthworks, locate and mark existing underground services in the areas to be affected by the works including clearing, excavating and trenching.

Contact: DIAL 1100 BEFORE YOU DIG is a free service, from anywhere in Australia. Underground pipe and cables are located (possible within two working days). See www.1100.com.au.

Prevent damage: Take all measures to prevent damage to existing underground and overhead utility services. Do not excavate by machine within 1 m of existing underground services. This is a **WITNESS POINT**.

3.2 LIMITS OF CLEARING

Survey

Submission: Submit a survey plan showing the proposed area for clearing to confirm the clearing perimeters. This is a **HOLD POINT**.

Pegging: Requirement for pegging includes surveying the areas and locating recovery pegs.

Extent of clearing

Clearing: The areas to be cleared are as shown on the drawings or schedules supplied and areas that will be occupied by:

- The completed Works.
- Erosion and sedimentation measures.
- Stockpile sites and borrow areas.
- A clearance zone of 4 m beyond tops of cuts and toes of embankments where the natural fall of the ground is towards the roadway.
- A clearance zone of 2 m beyond the tops of cuts and toes of embankments where the natural fall of the ground either slopes away from the roadway or is level.

Removal of miscellaneous items: Submit the requirement for any removal of minor miscellaneous items such as minor structures (eg. fences and livestock yards), redundant kerb and gutter, bitumen surfacing, footpaths and driveways, rubbish and any other materials located within the extent of the clearing. This is a **HOLD POINT**.

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 limits of clearing specified or approved.

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

3.3 WEED CONTROL

Procedures

Tagging: Tag areas identified in the **Weed management plan**. The Superintendent may require additional areas. This is a **WITNESS POINT**.

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 the local authority.

3.4 TREES TO BE PRESERVED

Tagging

Inspection: The Superintendent and CTPO will inspect the proposed area for clearing to confirm the clearing perimeters and mark with ribbon markers, or indicate to the Contractor the trees to be preserved or transplanted. This is a **HOLD POINT**

Program: Implement protective measures before commencement of clearing.

Signage

Warning sign: Display a sign in a prominent position at each entrance to the site, warning that trees and plantings are to be protected during the contract. Remove on completion.

Lettering: Road sign type sans serif letters, 100 mm high, in red on a white background, to AS 1744.

Work near trees noted for protection

Exclusion zone: The area within 4 m of the trunks of trees 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.

This is a **WITNESS POINT**

Work method statement: Approval by both the Superintendent and the CTPO is required for works within the exclusion zone of the protected trees. Submit a detailed work method statement involving the protection methods listed in **Tree protection**. This is a **HOLD POINT**.

Harmful materials: Keep the area within the dripline free of sheds and paths, construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.

Transplanting

Method: The lifting and temporary storage of the nominated vegetation for transplanting to conform with *0257 Landscape – roadways and street trees*.

Excavation within 4 m of tree trunks

Damage prevention: Submit a work method statement prior to any excavation within 4 m of the trunk of any tree. The work method must avoid damage to the tree and its root system. This work method must be approved by the Superintendent and CTPO. This is a **HOLD POINT**.

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

Tree protection

Tree enclosures: Temporary protective enclosures must be 10 times the trunk diameter at 1500 mm measured as a radius from the trunk and may consist of wire, mesh or chain material.

Wire enclosures: Four strands of fencing wire, or plastic mesh barrier, supported on plastic capped star pickets spaced at not more than 4 m.

Mesh enclosures: SL 62 to AS/NZS 4671 reinforcing mesh 1800 mm high wired to 2400 mm long star pickets, driven 600 mm into the ground, spaced 1800 mm apart at a minimum distance of 1 m from the tree trunk.

Chain wire enclosures: 1800 mm high chain wire panels fixed to 40 mm diameter galvanized steel posts.

Trunk protection: If space is not available for tree enclosures provide trunk protection comprising 2000 mm long planks of 100 mm x 50 hardwood stacked vertically around the trunk and secured with 10 gauge wire over hessian protective padding.

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.

Tree roots: No tree roots to be cut without prior approval. This is a **WITNESS POINT**.

Work under trees: Do not remove or add topsoil to the area within the dripline of the trees.

Hand methods: Use 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 ensure as little soil as possible is removed and heaped with the cleared vegetative material.

Roots: Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use means of cutting that do not unduly disturb the remaining root system.

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®).

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 300 mm maximum depth.

Compaction of backfill: Place layers of backfill 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 200 mm 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 dripline. If compaction occurs, give notice and obtain instructions.

Compaction protection: Protect areas adjacent to the tree dripline, if required submit within the work method statement a proposal for an elevated platform to suit the proposed earthworks machinery.

Mulching: Spread 100 mm thick organic mulch to the whole of the area covered by the drip line of all protected trees.

Trees within proposed embankment areas

Notice: Give notice immediately where a tree marked for preservation is located within an area proposed for embankment construction. The Superintendent will decide after approval from the CTPO whether the tree is to be removed or protected. This is a **HOLD POINT**.

Variation to the contract: The cost of protective measures for **Trees within proposed embankment areas** will be paid for as a variation to the Contract.

Unsound trees in road reserve

Clearing: Seek approval from CTPO and the Superintendent to clear any unsound tree remaining within the road reserve, but outside the limits of clearing that is likely to fall upon the roadway. This is a **HOLD POINT**.

Pruning: Cut back by hand close to the bole of the tree or main branches, any branch overhanging the road formation to within 0.5 m of the tree trunk to conform with AS 4373.

Disposal: Dispose of any unsound trees and over hanging branches to conform with **Chipping of cleared vegetation.**

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 owners written consent. This is a **HOLD POINT.**

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 vegetation, landforms or fauna habitat must be rehabilitated in consultation with an environmental officer. 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 with subsequent nurturing, repairs to foliage or root systems of trees and shrubs and reinstatement of fauna habitat.

3.5 GRUBBING

General

Extent of grubbing: All trees and stumps on, or within the limits of clearing which are unable to be felled and removed.

Depth of grubbing: Carry out grubbing operations to a depth of 0.5 m below the natural surface or 1.5 m below the finished surface level, whichever is the lower.

Blasting: Explosives are not permitted for any site activity without prior approval. This is a **HOLD POINT.**

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. Compact the backfill material to the density of the existing material in the adjacent ground. This is a **WITNESS POINT.**

3.6 TREATMENT OF CLEARED VEGETATION

Milling

Millable timber: Trim branches to conform with AS 1473.1 any timber species identified for milling. Stack in neat manageable stockpiles in approved locations.

Fauna habitat

Large tree trunks: Cut into transportable logs not less than 3.4 m in length and stockpile clear of construction for later placement any tree trunks nominated for salvage as fauna habitat logs.

Wood chip mulch

Prepare: Cut or split to a size to facilitate chipping or incorporation into the existing topsoil as specified all remaining timber that is not for milling or use as fauna habitat logs or for disposal offsite.

Wood-chip mulch: Produce a wood-chip mulch derived from crowns of trees and branches of shrubs cleared under this worksection.

Dimensions of wood-chip 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 75 mm and 50 mm.

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

Stockpiling

Landscaping: Stockpile the wood-chip mulch for subsequent use in landscaping to conform with *0257 Landscape – roadways and street trees* 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 degradation: Stockpiling operations to ensure that the properties of the cleared vegetation are not degraded and made unsuitable for use in the revegetation works.

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 5 m bottom width, 1.5 m high, batter 1 H: 1.5 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 drivers sight lines or affect road safety.

Rehabilitation: Rehabilitate stockpile sites to conform with *0257 Landscape – roadways and street trees*.

3.7 DISPOSAL OF MATERIALS**General**

Removal from site: Unless otherwise specified elsewhere in this worksection, all materials cleared and grubbed become the property of the Contractor and are to be removed from the site and disposed of legally.

Burning of disposed material: Approval required for disposal by burning timber and other combustible material. If approved comply with all Statutory Regulations applicable to burning off during the period of the Contract. This is a **HOLD POINT**.

Hazard minimisation: Perform any burning off in such a manner that no damage is done to any protected trees or trees outside the limits of clearing. Ensure that smoke resulting from such burning off does not cause a traffic hazard.

4 MEASUREMENT AND PAYMENT**4.1 MEASUREMENT****General**

Payments made to the Schedule of Rates: To *0152 Schedule of rates – supply projects*, this worksection, the drawings and Pay items **1111.1** to **1111.3** inclusive.

Lump Sum prices: Not acceptable.

Unpriced items: For each unpriced item listed in the Schedule of Rates, make due allowance in the prices of other items.

Methodology

The following methodology will be applied for measurement and payment:

- Erosion and sedimentation control measures are measured and paid in accordance with *1102 Control of erosion and sedimentation (Construction)*.
- Clearing and grubbing for boundary fencing is measured and paid in accordance with *1195 Boundary fencing for road reserves*.

PAY ITEMS

Pay items	Unit of measurement	Schedule rate scope
1111.1 Clearing and grubbing	Hectare	All costs associated with all documentation, survey, clearing and grubbing within the plan area bounded by the limits of clearing specified in Limits of clearing.
1111.2 Removal of trees outside limits of clearing	'Each' tree	All costs associated with removal of trees outside the area bounded by the limits of clearing specified in Limits of clearing. The schedule quantity is a provisional quantity.
1111.3 Wood-chipping	'm ³ ' in stockpile.	All costs associated with wood-chipping and stock piling the schedule quantity is a provisional quantity.