

# Engineering Construction Specification C05 Clearing and Grubbing

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This document is a modified version of AUS-SPEC 1111  
Clearing and Grubbing October 2018 version

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# 1 General

## 1.1 Responsibilities

### 1.1.1 General

Requirements: Provide clearing and grubbing of vegetation and minor man-made structures (such as fences and livestock yards) and all rubbish and other materials which, in the opinion of the Superintendent, are unsuitable for use in the Works and the chipping of crowns of trees and stumps to allow site works for roadway construction to conform with drawings, permits, vegetation clearing schedules as documented.

### 1.1.2 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.

All natural landscape features, including natural rock outcrops, natural vegetation, soil and watercourses are to remain undisturbed except where affected by the Works as approved by the Superintendent.

## 1.2 Cross references

### 1.2.1 General

Requirement: This worksection is not a self-contained specification. In addition to the requirements of this worksection, conform to the following:

- *C01 General requirements (Construction)*
- *C02 Quality management (Construction)*
- *C03 Control of traffic*
- *C04 Control of erosion and sedimentation (Construction)*
- *C29 Landscape - road reserve and street trees*

## 1.3 Standards

### 1.3.1 General

Pruning of amenity trees: To AS 4373.

Protection of trees on development sites: To AS 4970

Wingecarribee Street Tree Implementation Plan 2016 - Adopted May 2016

## 1.4 Interpretation

### 1.4.1 Abbreviations

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

- CTPO: Council's Tree Preservation Officer.

### 1.4.2 Definitions

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

- Dripline: The most outer reach of a tree's branches.
- Weed: An invasive plant that degrades natural areas, reduces the sustainability or affects the health of people and animals.

## 1.5 Submissions

### 1.5.1 Design documentation

Survey: Submit a survey plan with area proposed for clearing.

Additional documentation may include VMP, Review of Environmental Factors, TRPZ, bush fire plan.

### **1.5.2 Execution details**

Clearing and grubbing plan: Submit a clearing and grubbing plan in conformance to **PRE-CONSTRUCTION PLANNING, CLEARING AND GRUBBING PLAN** and the Review of Environmental Factors.

Weed management plan: Submit a Weed management plan in conformance to **PRE-CONSTRUCTION PLANNING, WEED MANAGEMENT PLAN, Weed control.**

Establishment: Submit a method statement in conformance to **PRE-CONSTRUCTION PLANNING, ESTABLISHMENT, Method statement.**

Areas to be cleared outside the limits: If proposed, state the purpose for clearing and submit plan for approval.

Weed control: Submit herbicide operator's licence for personnel engaged in herbicide spraying.

Unsound trees in road reserve: Submit a proposal to clear unsound trees remaining within the road reserve, but outside the limits of clearing.

Disposal of material: If burning is proposed, submit for approval.

### **1.5.3 Records**

Owners consent: Submit a copy of the owner's written consent to enter property to remove timber for disposal, or for fallen timber to remain on private property.

### **1.5.4 Reports**

Clearing report: Before clearing, submit a clearing report in conformance to **PRE-CONSTRUCTION PLANNING, WEED MANAGEMENT PLAN, Clearing report.**

### **1.5.5 Variations**

Trees within proposed embankment areas: Submit details if a tree marked for preservation is located within an area proposed for embankment construction.

## **1.6 Inspections**

### **1.6.1 Notice**

General: Give notice so that inspection may be made of the following:

- Weed control: Determine if additional areas require weed control.
- Trees within proposed embankment areas: Trees to be protected.
- Tagging: Tagging of protected trees.
- Limits of clearing: Peg out area for clearing.
- Unsound trees in road reserve: Trees marked outside the limits of clearing.
- Protection of trees on development sites including barricading: To AS 4970.

## **2 Pre-construction planning**

### **2.1 Clearing and grubbing plan**

#### **2.1.1 General**

Requirement: Prepare a clearing and grubbing plan including the following details:

- Areas to be cleared and grubbed.
- Areas of weed removal.

- Threatened flora species and trees marked for preservation.
- Manage fauna in accordance with the Review of Environmental Factors.

## **2.2 Weed management plan**

### **2.2.1 Weed control**

Requirement: Prepare a weed management plan including the following details:

- Identification of weeds and infestation zones within the work site and 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.

### **2.2.2 Clearing report**

General: Prepare a clearing report including the following:

- Statement from an ecologist identifying species and location of any weeds in the areas to be cleared and grubbed.
- Locations of threatened flora species and trees identified for preservation.
- Manage fauna in accordance with the Review of Environmental Factors.
- List of any trees outside limits of clearing which are unsound and likely to fall on roadways or into neighbouring property.

## **2.3 Establishment**

### **2.3.1 Survey**

Requirement: Survey the proposed area for clearing and prepare site plans showing the clearing perimeters.

Pegging: Peg out the site area including recovery pegs.

### **2.3.2 Erosion control**

Rivers, creeks and watercourses: Retain existing trees and ground cover within 15 m of rivers, creeks and watercourses and in drainage lines until directly before construction begins to minimise erosion, or as required by VMP and the relevant legislation.

### **2.3.3 Method statement**

Requirement: Document the proposed methods, equipment and materials to be used for works within the exclusion zone, including the following:

- Protection methods.
- Excavation methods.
- Cutting of tree roots more than 50 mm diameter.
- Proposal for elevated platforms for earthwork machinery.
- Rehabilitation of damaged areas.
- If proposed, work within the dripline of trees within the exclusion zone. Stockpiling and undertaking construction activities not permitted within the dripline of trees.

### **2.3.4 Planning and programming**

Requirement: Progressively carry out clearing with only the minimum area of land being disturbed at any time. Make sure that the absolute minimum area for construction is cleared.

Ensure flora and fauna is management in accordance with the Review of Environmental Factors.

## **2.4 Limits of clearing**

### **2.4.1 General**

Extent of clearing: As documented and areas occupied by the following:

- The completed Works.
- Erosion and sedimentation measures.
- Stockpile sites and borrow areas.
- If the natural fall of the ground is towards the roadway, a clearance zone of 4 m beyond tops of cuts and toes of embankments, or as otherwise specified in the Review of Environmental Factors.
- If the natural fall of the ground either slopes away from the roadway or is level, a clearance zone of 2 m beyond the tops of cuts and toes of embankments, or as otherwise specified in the Review of Environmental Factors.

## **2.5 Areas to be cleared outside the limits**

### **2.5.1 General**

Extent: If areas outside the limits are proposed to be cleared, clear the area to the extent defined in approved plans.

Requirement: Avoid danger to personnel, traffic, other trees, shrubs and structures.

Natural landscape features: Protect natural rock outcrops, natural vegetation, soil and water courses against disturbance.

## **2.6 Weed control**

### **2.6.1 Procedures**

Requirement: Tag areas documented in the **WEED MANAGEMENT PLAN**.

Implementation: Do not spread weeds during the clearing operations and remove all identified weeds as a separate operation.

Qualification: Use personnel with current pesticide operators' licence issued by the local authority.

## **2.7 Vegetation preservation**

### **2.7.1 Tagging**

Requirement: Mark all trees documented for preservation or transplanting with ribbon markers.

### **2.7.2 Signage**

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

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

### **2.7.3 Work near trees noted for protection**

Exclusion zone: Do not carry out the following activities within 4 m of the trunks of protected trees: Erection of structures.

- Filling.
- Changes to soil profiles.
- Stockpiling of spoil.
- Storage of other materials.
- Driving or parking of any vehicle or machinery.

Dripline: Conform to the following:

- Area within dripline: Free of sheds and paths, construction material and debris.
- Bulk materials: Do not place bulk material and harmful materials under or near trees.
- Spoil: Do not place spoil from excavations against tree trunks.
- Wind-blown material: Prevent wind-blown materials such as cement from harming trees and plants.

### **2.7.4 Tree enclosures**

General: Provide temporary protective enclosures consisting of wire, mesh or chainwire material.

Size: 10 times the trunk diameter measured at 1500 mm above ground, as a radius from the trunk.

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 chainwire panels fixed to 40 mm diameter galvanized steel posts.

### **2.7.5 Tree protection**

Program: Install protection measures before starting clearing in accordance with the Australian Standard for tree protection on development sites AS 4970.

Trunk protection: If space is not available for tree enclosures, construct 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: If excavating near trees, provide continuous 900 mm high corrugated galvanized steel sheeting, bedded 150 mm into the ground, and wired to the enclosure.

Damage: Prevent damage to tree bark and root system. Do not attach stays and guys to trees.

Tree removal: Minimise damage to protected trees by felling trees towards the centre of the area to be cleared. Cut tree in sections from top downward.

Roots: If tree roots less than 50 mm are cut, use cutting method that does not unduly disturb the remaining root system. Water the tree and apply a liquid rooting hormone immediately after cutting to stimulate the growth of new roots.

Compacted ground: Do not compact the ground or use skid-steel vehicles within the dripline.

Compaction protection: If earthwork machinery is required to operate within the dripline install an elevated platform.

Mulching: Spread 100 mm thick organic mulch to the whole of the area within the dripline of all protected trees.

### **2.7.6 Transplanting of trees**

Method: Lift and temporarily store the documented vegetation for transplanting to **TRANSPLANTING STREET TREES** in the *C29 Landscape - road reserve and street trees* worksection.

### **2.7.7 Protection of other vegetation**

Existing shrubs, native grasses and ground covers: Protect areas by temporary fencing.

## 2.8 Clearing operations

### 2.8.1 General

Requirement: Remove items including vegetation both living and dead, minor structures, redundant kerbs and gutters, bitumen surfacing, footpaths and driveways, rubbish and any other materials located within the limits of clearing.

### 2.8.2 Excavation near tree trunks

Open excavations: Minimise the time period an excavation is left open under tree canopies.

Topsoil: Do not remove or add topsoil to the area within the dripline.

Clearing machines: Fit machines used for pushing and heaping operations with appropriate attachments and operate to limit the amount of soil removed and heaped with the cleared vegetative material.

### 2.8.3 Working near tree roots

Hand excavation methods: If excavation is required within the dripline, use hand methods to preserve root systems intact and undamaged. Use hand methods to locate, expose and cleanly cut the roots on the line of the excavation.

Backfill material: A mixture of three parts by volume of topsoil and one part of well-rotted compost with a neutral pH value and free from weed growth and harmful materials.

Maximum backfill depth: 300 mm.

Compaction of backfill: Place layers of backfill and compact to a dry density similar to 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 required, including where roots are exposed, at ambient temperature greater than 35°C. Thoroughly water the root zone immediately after backfilling.

### 2.8.4 Damage

Restoration: Rectify damage to vegetation, landforms, fauna habitat, and fencing that occurs during the clearing operations. Restore all damage to pre-construction conditions in the shortest period of time using the following methods:

- 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.

### 2.8.5 Unsound trees in road reserve

Marking of unsound trees: Tag unsound trees outside the limits of clearing.

Pruning: To AS 4373.

Disposal: Dispose of any unsound trees and overhanging branches to **TREATMENT OF CLEARED VEGETATION**.

Timber falling on private property: Prevent timber from falling on private property at all times.

## 2.9 Grubbing

### 2.9.1 General

Extent: All trees and stumps on, or within the limits of clearing which cannot 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 top of the selected material zone.

## **2.9.2 Backfill**

Holes and depressions: Immediately backfill holes or depressions remaining after grubbing trees and stumps to prevent the infiltration and ponding of water. Fill with soil material similar to the adjacent ground and compact the backfill material to at least the relative compaction of the material existing in the adjacent ground.

Areas outside the limits of clearing: Final backfill with 50 mm topsoil and vegetate within 7 days of removal of stump.

## **2.10 Treatment of cleared vegetation**

### **2.10.1 Milling**

Timber species documented for milling: Trim branches and stack in neat manageable stockpiles in approved locations.

### **2.10.2 Fauna habitat**

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

### **2.10.3 Woodchip mulch**

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

Woodchip mulch: Produce a woodchip mulch from crowns of shrubs and maximum 100 mm diameter branches of trees cleared under this worksection.

Dimensions of woodchip mulch: Two orthogonal dimensions less than 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.

### **2.10.4 Stockpiling of chipped vegetation**

Landscaping: Stockpile the woodchip mulch for subsequent use in landscaping to the **Management of stockpiles and batters** in the *C29 Landscape - road reserve and street trees* worksection or for use at other locations if required.

Mixing: Mix the chipped vegetation into the existing topsoil during topsoil operations, as documented.

Avoid degradation: Carry out stockpiling operations so that chipped vegetation is suitable for use in the revegetation works.

Avoid contamination: Provide vegetation stockpiles free from stones, soil, rubbish and other materials and make sure stockpiles are not contaminated with matter toxic to plant growth.

Shape of stockpile: 5 m bottom width, 1.5 m high, batter 1H:1.5V.

Weed free: Keep vegetation stockpile sites free of weeds for the duration of the stockpiling period. Treat as necessary to control the weed species in conformance with requirements of local council.

Location: Locate stockpile sites away from drainage lines and position to allow ease of transport of materials at any time. Make sure stockpiles do not influence driver's sight lines or affect road safety.

Rehabilitation: Rehabilitate stockpile sites to **Grassing** in the *C29 Landscape - road reserve and street trees* worksection.

## 2.11 Disposal of materials

### 2.11.1 General

All waste management is the responsibility of the applicant and their contractor. There may be opportunities to reuse some excavated material within a site. Any waste not suitable for reuse shall be disposed of by the Contractor to a suitably NSW EPA licenced Landfill. Council's Resource Recovery Centre may be able to accept waste from a site as would many other nearby licenced landfills.

Council does not operate stockpile sites and is unable to accept waste material generated from road

Re-use: Wherever possible re-use material.

Removal from site: Remove from site any material that cannot be re-used, in conformance with the Waste management plan. Consult and obtain approval from Council for material disposal facilities.

Document the removal and legal disposal of all materials cleared from the site, in accordance with the approved Waste Management Plan.

Hazard minimisation: If burning is permitted by relevant authorities, conform to the following:

- Apply for relevant permits.
- Prevent damage to protected trees or trees outside the limits of clearing.
- Make sure that smoke resulting from such burning off does not cause a traffic hazard.
- Give notice of the intention to burn to neighbours and obtain a permit from the NSW Rural Fire Service (if applicable).

## 2.12 Completion

### 2.12.1 General

Requirement: At completion of clearing and grubbing, do not drive machinery or equipment over or disturb areas where there is no construction works proposed.

Warning signs on protected trees: Remove all tags.

## 3 Annexures

### 3.1 Annexure - Summary of hold and witness points

Reference No:	Clause and description	Type*	Submission/Inspection details	Submission/Notice times	Process held
C05-HP01	SUBMISSIONS, Design documentation Survey	H	Submit a survey plan showing the proposed area for clearing to confirm the clearing perimeters	7 days before commencement of clearing	Commencement of clearing
C05-HP02	SUBMISSIONS, Execution details Clearing and grubbing plan	H	Submit a clearing and grubbing plan or landscape and vegetation plan.	7 days before commencement of clearing	Commencement of clearing
C05-HP03	SUBMISSIONS, Report	H	Clearing report	7 days before commencement of clearing	Commencement of clearing

Reference No:	Clause and description	Type*	Submission/Inspection details	Submission/Notice times	Process held
	Clearing report				
C05-HP04	SUBMISSIONS, Execution details  Establishment	H	Submit a method statement including proposed methods, equipment and materials	7 days before commencement of clearing	Commencement of clearing
C05-HP05	INSPECTION, Notice  Limits of clearing	H	Peg out area for clearing	7 days before commencement of clearing	Commencement of clearing, For development inspections book through "MyInspect"
C05-WP06	INSPECTIONS, Notice  Tagging	W	Trees marked for preservation and transplanting are tagged	7 days before commencement of clearing	-
C05-HP07	INSPECTIONS, Notice  Trees within proposed embankment areas	H	Trees to be protected	7 days before commencement of clearing	Commencement of clearing, For development inspections book through "MyInspect"
C05-WP08	INSPECTIONS, Notice  Unsound trees in road reserve	W	Marking of trees outside the limits of clearing	3 days before site clearing	-
C05-WP09	INSPECTIONS, Notice  Weed control	W	Identify any additional areas that require weed control	1 day after tagging of areas to be weed controlled	-
C05-HP10	SUBMISSIONS, Execution details  Work within exclusion zone and dripline	H	Submit a method statement	7 days before work within exclusion zone and dripline	Work within exclusion zone and dripline
*H = Hold Point, W = Witness Point					

### **3.2 Annexure - Referenced documents**

The following documents are incorporated into this worksection by reference:

AS 1744	2015	Standard alphabets for road signs
AS 4373	2007	Pruning of amenity trees
AS/NZS 4671	2001	Steel reinforcing materials
AS 4970	2009	Protection of trees on development sites
Wingecarribee Street Tree Implementation Plan 2016 - Adopted May 2016		