

PART L23
PLANT RESCUE AND MAINTENANCE

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1. GENERAL

- .1 This Part specifies the requirements for the rescue of plants from roadwork sites. It includes plant rescue methods (relocation, seed collection or taking vegetative cuttings), but primarily focuses on plant relocation procedures (root preparation and excavation, lifting and backfill requirements), and the installation of marker stakes, tree guards, weed mats and mulch around relocated plants.
- .2 This Part also specifies maintenance requirements for relocated plants. This includes watering, weed control, pest/disease control, maintenance of marker stakes, tree guards, weed mats and mulch and removal of marker stakes and tree guards.
- .3 Maintenance shall mean the continued care of rescued plants within the Extent of Works area indicated on the Drawings to promote healthy and vigorous growth by implementing accepted horticultural practices, as well as rectifying any defects that become apparent in the works under normal conditions and according to the season.
- .4 The Contractor shall be responsible for maintenance of relocated plants for the period following the commencement of the plant rescue program.

2. PLANT RESCUE**General**

- .1 Seed or cuttings shall only be taken from the plants which are to be removed.

Plant Rescue Methods

- .2 The Contractor shall use the following plant rescue methods:
 - (a) **Plant Relocation:** The Contractor shall relocate the individual plants listed. Relocation shall mean:
 - direct relocation on site,
 - direct relocation to another site, or
 - relocation to a site following a period of holding in a nursery.
 - (b) **Seed Collection:** Prior to plants being cleared from the work site, the Contractor shall collect seed from the individual plants listed.

The Contractor shall determine when seed is mature and ready for collecting, and shall collect, extract, clean and label the seed. Seed shall be labelled to indicate the plant species name, date of collection, weight of seed and place of collection. The seed shall be stored in air-tight containers at a constant temperature, away from direct light.

Seed shall be provided to the Principal or the nursery nominated.
 - (c) **Vegetative Cuttings:** Prior to plants being cleared from the work site, the Contractor shall take vegetative cuttings from the individual plants listed.

The Contractor shall determine when to take the cuttings and the best type to take (e.g. young growth, mature material). Cuttings shall be labelled with plant species name, date and place of collection, and stored in moist paper in a cool place prior to planting.

Vegetative cuttings shall be provided to the Principal or the nursery nominated.

3. PLANT RELOCATION PROCEDURES**Timing**

- .1 If practicable plants shall be moved in Autumn or Winter when their growth rate is slowest and the soil is moist.

Weed Control

- .2 The areas where plants are to be relocated shall be eradicated of weeds before replanting commences. Any existing vegetative growth shall be slashed to a height of 150 mm.
- .3 Trash build-up and cut material shall be removed from the area prior to spraying with a knockdown herbicide (Roundup) incorporating a herbicide marker. Roundup Biactive shall be used around wetlands and waterways. The herbicide shall be used according to the manufacturers' recommended rates. Any off-target damage shall be made good by the Contractor at the Contractor's expense.

Root Preparation

- .4 The Contractor shall undertake root pruning in advance of relocating. The Contractor shall cut the roots at the margins of the rootball, and shall allow the plant to 'adjust' whilst still in situ. For large plants (trees and shrubs) root cutting shall occur progressively commencing at least 4-8 weeks prior to the plant being dug from the ground. A section of the margin of the rootball shall be cut each week during the period leading up to the plant being relocated.

Setting Out

- .5 The Contractor shall set out the replanting locations in accordance with the Drawings or as directed by the Principal on site.
- .6 Replanting locations shall be set out in accordance with Roadside Clear Zones and Sight Line Guidelines and other Service Authority legislation and regulations. Trees and large shrubs shall not be planted within 2.5 m of any pedestrian or cycle path. Other vegetation shall not be replanted within 2 m of any fence.
- .7 The Contractor shall advise the Principal when setting out has been completed. Two working days shall be allowed for the Principal to inspect and approve the setting out.

Preparation of Planting Holes

- .8 Planting holes shall be prepared before the plant to be relocated is dug up. As far as practicable, topsoil and subsoil shall be kept separate when preparing planting holes. The Contractor shall remove from site any unsuitable material brought to the surface during excavation.
- .9 The hole shall be at least twice the diameter of the rootball and no deeper than the height of the proposed rootball. If the depth of the hole exceeds the rootball height, compacted soil shall be added to the hole to prevent settling after transplanting. Sides of the hole shall be sloped and roughened to create an irregular surface that will facilitate root penetration.
- .10 The Contractor shall use the following planting hole methods:
 - (a) Spade Dug;
 - (b) Mini Excavator/Backhoe/Skid Steer Loader;
 - (c) Hand-operated Auger; and/or
 - (d) Machine-mounted Auger

Root Excavation Technique

- .11 Before any excavation is carried out, the Contractor shall thoroughly water the plants to be relocated and shall mark the proposed rootball size on the ground. In general, the rootball diameter for larger plants (trees and shrubs) should be 10 mm for every 1 mm of trunk diameter, measured at 300 mm above the ground.
- .12 For tussock grasses and other strap leaf plants the rootball shall generally be twice the diameter of the base of the tussock.
- .13 The Contractor shall use the following root excavation methods:
 - (a) **Spade Dug:** Plants shall be dug from the ground using a spade. Beyond the edge of the rootball, a sharp spade shall be driven into the ground, cutting all the way around the plant. Soil taken with the plants shall extend a minimum of 100 mm beyond the rootball to minimise disturbance and/or root damage. Any exposed roots shall be pruned flush with the face of the root ball using sharp secateurs or loppers, ensuring the rootball is not loosened.

If necessary, the root ball shall be wrapped in natural fibre (e.g. hessian) to prevent soil being lost during relocation. Once the ball is securely wrapped and tied, the plant shall be undercut. (Small plants may not need to be wrapped, especially if the soil is moist and holds together).

A spade shall be used to excavate roots in situations where the use of other machinery would cause undue damage to the remaining vegetation.

This method is most suitable for relocating individual small plants or clumps of bulbous, grass or sedge species.

- (b) **Mini Excavator/Backhoe/Skid Steer Loader Excavated:** Plants shall be dug from the ground using a mini excavator, backhoe or skid steer loader. Soil taken with the plants shall extend a minimum of 150 mm beyond the rootball to minimise disturbance and/or root damage. Any exposed roots shall be pruned flush with the face of the root ball using sharp secateurs or loppers, ensuring the rootball is not loosened.

If necessary, the root ball shall be wrapped in natural fibre (e.g. hessian) to prevent soil being lost during relocation. Once the ball is securely wrapped and tied, the plant shall be undercut. (Small plants may not need to be wrapped especially if the soil is moist and holds together).

This root excavation method shall only be used for sites that are sparsely vegetated and where the machinery will not cause undue damage to the remaining vegetation.

Lifting Technique

- .14 Plants shall be lifted from their existing location and immediately placed in the pre-prepared planting holes.
- .15 For small plants, the rootball shall be lifted from the hole by hand or by using a sling attached to a small machine.
- .16 Lifting of plants shall be carried out or supervised by a qualified and/or suitably experienced horticulturist and crane/machine operator.
- .17 Appropriate lifting equipment shall be used.
- .18 Suitable slings shall be attached around a balance point of the plant and shall provide a support system around the root ball. When a sling is attached to the plant, padding and protection is required to reduce possible damage. Plants shall not be lifted by the trunk alone. A qualified crane/machine operator shall determine the support system to be used.

Backfill

- .19 Once the plant has been placed in the hole it shall be backfilled with site topsoil and lightly consolidated. The plant shall be set at a height such that the surface of rootball is at the same level as the surrounding soil surface.
- .20 Only topsoil free from perennial weeds, stones, debris, clods of subsoil or other deleterious material may be used as backfill for planting. Topsoil stockpiled from the removal site also may be used as backfill.
- .21 Where in the opinion of the Principal excavated material is unsuitable for backfill, imported soil shall be used. Imported soil shall be matched as closely as practicable to the existing site soil. Organic matter shall not be added to the backfill material.

Soil Additives

- .22 The Contractor shall use the following soil additives:
 - (a) **Water Retention Agents:** Water retention agents (i.e. AquaBoost AG, Alcosorb Water Crystals) shall be applied in accordance with the manufacturer's instructions and recommended rates. The watering regime during the maintenance period shall be closely monitored to ensure over watering does not occur.
 - (b) **Terracottem:** TerraCottem shall be applied in accordance with the manufacturer's instructions and recommended rates.

Watering Basin

- .23 A shallow watering basin capable of holding the volume of water nominated shall be constructed around the perimeter of the rootball.

Initial Watering

- .24 Immediately following planting, each plant shall be watered with the volume of clean potable water nominated.

Initial Fertiliser

- .25 Aquasol, Thrive or Maxicrop shall be applied at the manufacturer's recommended rates once per month, for 6 months.

Reducing Water Loss

- .26 The foliage shall be lightly pruned to reduce transpiration.
- .27 An antitranspirant shall be applied in a spray form prior to relocation. The Contractor shall be responsible for arranging the correct amount of antitranspirant for each plant.
- .28 The Contractor shall use the following antitranspirants:
 - (a) **Anti-Stress:** Anti-Stress 2000 shall be applied to the foliage in accordance with the manufacturer's instructions and recommended rates.
 - (b) **Stressguard:** Stressguard shall be applied to the foliage in accordance with the manufacturer's instructions and recommended rates.

Marker Stakes

- .29 All relocated plants shall be identified with marker stakes.
- .30 Stakes shall be straight, free from knots or twists, pointed at one end, and driven a minimum of 250 mm into the planting hole with no less than 500 mm remaining above ground level.
- .31 The Contractor shall use the following marker stake types:
 - (a) Bamboo Stakes - 750 mm long, 10-12 mm diameter
 - (b) Recycled Plastic Stakes - 750 mm long, 25 x 25 mm
 - (c) Hardwood Stakes – Small 750 mm long, 25 x 25 mm
 - (d) Hardwood Stakes – Large 1 m long, 25 x 25 mm

Tree Guards

- .32 The Contractor shall use the following tree guard type and supply responsibilities:
 - (a) Rigid Polypropylene Fluteboard (450 x 230 mm sides)
 - (b) Polyethylene Plastic Sleeve (450 x 350 mm flat)
 - (c) Mesh.
- .33 Tree guards shall be assembled and positioned around the plant in accordance with the manufacturer's instructions.
- .34 Support stakes shall extend 50 mm above the tree guard, and be driven a minimum of 250 mm into the ground.

Weed Mats

- .35 The Contractor shall use the following weed mat types:
 - (a) Jutemat Biodegradable (750 – 800 gsm) 370 x 370 mm
 - (b) Jutemat Biodegradable (750 – 800 gsm) 600 x 600 mm
 - (c) ReCover 100% Recycled Fibre 370 x 370 mm
 - (d) ReCover 100% Recycled Fibre 600 x 600 mm
- .36 Weed mats shall be installed in accordance with the manufacturer's instructions.

Mulch

- .37 Mulch shall be evenly spread to a depth of 100 mm. All mulch material shall slope toward the base of stems of plants so that the mulch is not in contact with the stems of the plants, and shall be raked to an even surface flush with the surrounding finished levels. The mulch shall be well leached, free from deleterious material such as soil, weeds, sticks and sawdust and shall have a low fines content.
- .38 Mulch available from the removal of other onsite vegetation shall only be used where and when stated and as approved by the Principal.
- .39 Following delivery of mulch to the site, the Principal may collect a sample to ensure consistency with the sample provided. If there are any deviations from the accepted sample, the Contractor shall either rectify the fault or remove the mulch from the site, replacing it with mulch that meets the specified requirements.
- .40 The Contractor shall use the following mulch types:

- (a) Forest Mulch;
- (b) Eco-Mulch; and/or
- (c) Red Gum Chip.

4. MAINTENANCE

General

- .1 The Contractor shall nominate when treatments are considered necessary and shall obtain the approval of the Principal to proceed with the treatment.

Watering Relocated Plants

- .2 It shall be the Contractor's responsibility to ensure that all plants maintain growth and are free of water stress at all times.
- .3 After the initial watering, each plant shall receive the volume of clean potable water nominated. Plants shall be watered on a fortnightly basis or as directed by the Principal. The Contractor shall inform the Principal at least one working day prior to watering as the frequency of watering will be subject to alteration by the Principal depending on:
 - (a) sufficient rain having fallen to warrant decreased frequency.
 - (b) hot and/or dry weather conditions prevailing at the time which may warrant increased frequency.
- .4 The Contractor shall seek approval from the Principal when due to climatic conditions it is considered that the watering frequency should be altered or if additional watering operations are required. The watering dish shall be kept intact at all times, unless instructed otherwise by the Principal.

Weed Control

- .5 An area of 1200 mm diameter around all plants (including the area inside tree guards) shall be kept free of weeds by spraying with a knockdown herbicide (Roundup) incorporating a herbicide marker. Roundup Biactive shall be used around wetlands and waterways. The herbicide shall be used according to the manufacturer's recommended rates. Any off-target damage shall be made good by the Contractor at the Contractor's expense. Weeds growing inside the tree guard shall be hand-pulled. Disturbance to the soil shall be minimised as much as possible.

Pest/Disease Control

- .6 Insect pests, fungus and disease shall be controlled by means of appropriate treatment.
- .7 All chemicals shall be used in accordance with the manufacturer's recommendations and shall be approved by the Principal. Any off-target damage shall be made good by the Contractor at the Contractor's expense.
- .8 The Contractor shall ensure the pest/disease control requirements and responsibilities are followed:
 - (a) **Pest/Disease Control Method Specified by the Principal:** Chemicals and application rates required to be used for the project shall be as specified by the Principal.
 - (b) **Pest/Disease Control Method Recommended by the Contractor:** As required during the Contract period the Contractor shall recommend preferred methods of pest/disease control for the project, and chemicals and application rates to be used.

Maintenance of Marker Stakes and Tree Guards

- .9 Where marker stakes or tree guards within the Extent of Works area indicated on the Drawings have become damaged or defective, they shall be replaced immediately by the Contractor with the same type of marker stake or tree guard. Tree guards shall be assembled and installed around the plant in accordance with the manufacturer's instructions. The Principal will determine if a marker stake or tree guard is damaged or defective and will need to be replaced. The Principal will pay for the cost of replacement marker stakes and tree guards, unless damage has resulted from the Contractor's operations

Maintenance of Weed Mats

- .10 Where the weed mats within the Extent of Works area indicated on the Drawings have become damaged or defective, they shall be replaced immediately with the same type of weed mat. The Principal will determine if a weed mat is damaged or defective and will need to be replaced. The Principal will pay for the cost of replacement weed mats, unless damage has resulted from the Contractor's operations.

Maintenance of Mulch

- .11 The Contractor shall re-mulch with the mulch specified as directed by the Principal throughout the Maintenance Period to maintain mass mulched areas and individual plant hole mulching to the specified depths. The Principal will pay for the cost of replacement mulch, unless damage has resulted from the Contractor's operations.

Follow-Up Fertiliser

- .12 A single application of 30 g of Nurticote or Osmocote shall be placed around the base of the plant.

Removal of Marker Stakes and Tree Guards

- .13 Tree guards and marker stakes shall be removed at the end of the Maintenance Period or as directed by the Principal. They shall be bundled in groups of 50 and delivered to the DPTI Depot, Bridge Road, Walkley Heights during office hours (8.00 a.m. - 4.00 p.m. Monday to Friday) to an area designated by the Principal. The Contractor shall give the Principal two working days notice prior to delivery.

5. HOLD POINTS

- .1 There are no Hold Points referenced in this Part.
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