

Public Realm

Master Specification

PR-LS-C8 Plant Rescue and Maintenance

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PR-LS-C8 Plant Rescue and Maintenance

1 General

- 1.1 This Part specifies the requirements for the rescue of plants from project 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.
- 1.2 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.
- 1.3 Maintenance shall mean the continued care of rescued plants within the Extent of Works area indicated on the Drawings or in the Design Report 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.
- 1.4 The Contractor shall be responsible for maintenance of relocated plants for the period stated in the Contract following the commencement of the plant rescue program.
- 1.5 All clauses of this Part apply unless otherwise specified in the Contract Documents.
- 1.6 Where a specification differs between the Drawing and the Design Report, the Drawing shall take precedence.
- 1.7 If not specified in the Drawings or Design Report, the clauses in this Part shall be followed.
- 1.8 For relocation of trees and palms, refer to PR-LS-C4 "Tree and Palm Transplanting".
- 1.9 Where required under the Controlled Substances Act 1984, and the Controlled Substances (Pesticides) Regulations 2003, employees undertaking pest control work shall hold a current Pest Management Technician's License.

2 Plant Rescue

General

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

Plant Rescue Methods

- 2.2 Refer to the Drawings or Design Report for the plant rescue method.

Plant Relocation

- 2.3 The Contractor shall relocate the individual plants listed in the Drawings or Design Report. Relocation shall mean:
 - a) direct relocation on site;
 - b) direct relocation to another site; or
 - c) relocation to a site following a period of holding in a nursery.

Seed Collection

- 2.4 Prior to plants being cleared from the work site, the Contractor shall collect seed from the individual plants listed in the Drawings or Design Report.
- 2.5 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 cool temperature, away from direct light.

- 2.6 Seed shall be provided to the nursery nominated for propagation of plants for the project or to a suitable storage facility.

Vegetative Cuttings

- 2.7 Prior to plants being cleared from the work site, the Contractor shall take vegetative cuttings from the individual plants listed in the Drawings or Design Report.
- 2.8 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.
- 2.9 Vegetative cuttings shall be provided to the nursery nominated for propagation of plants for the project.

3 Site Conditions for Plant Relocation

- 3.1 Plants shall be relocated as close as possible to the original location taking into consideration soil type, aspect, microclimate, etc.

4 Plant Relocation Procedures

Timing

- 4.1 Refer to the Drawings or Design Report for the timing requirements.
- 4.2 If practicable, plants shall be moved in Autumn or Winter when their growth rate is slowest and the soil is moist.

Weed Control

- 4.3 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.
- 4.4 Trash build-up and cut material shall be removed from the area prior to spraying with a knockdown herbicide (Roundup or equivalent) incorporating an herbicide marker. Roundup Biactive (or equivalent) 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.

Root Preparation

- 4.5 If nominated in the Drawings or Design Report, the Contractor shall undertake root pruning in advance of relocating. The Contractor shall cut the roots at the margins of the root ball to allow the plant to "adjust" whilst still in situ. For large plants (trees and shrubs) root preparation shall occur progressively, commencing at least 4-8 weeks prior to the plant being dug from the ground.

Setting Out

- 4.6 The Contractor shall set out the replanting locations in accordance with the Drawings or Design Report, or as directed by the Principal on site.
- 4.7 Replanting locations shall be set out in accordance with Austroads Guidelines for clear zones and sight lines and other Service Authority legislation and regulations. Trees and large shrubs shall not be planted within 3.0 m of any pedestrian or cycle path. Vegetation shall not be replanted within 2 m of any fence.
- 4.8 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. This shall constitute a **Hold Point**.

Preparation of Planting Holes

- 4.9 Refer to the Drawings or Design Report for the preparation of planting hole method.
- 4.10 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.
- 4.11 The hole shall be at least twice the diameter of the root ball and no deeper than the height of the proposed root ball. If the depth of the hole exceeds the root ball 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.
- 4.12 Where underground services are present, planting holes shall be dug by hand.
- 4.13 Where augers are used, holes shall be at least 150 mm greater than the diameter of the plant root ball and a minimum depth of 100 mm below the root ball. Sides of the hole shall be rough sided to create an irregular surface which will facilitate root penetration.
- 4.14 Where mini excavator / Backhoe / Skid Steer Loaders are used, the plant holes shall be at least 300 mm greater than the diameter of the plant root ball and a minimum depth of 150 mm below the root ball. Sides of the hole shall be rough sided to create an irregular surface which will facilitate root penetration. The subsurface material at the bottom of the hole shall be decompacted to a depth of 100 mm.

Root Excavation Technique

- 4.15 Refer to the Drawings or Design Report for the root excavation method.
- 4.16 Before any excavation is carried out, the Contractor shall thoroughly water the plants to be relocated and shall mark the proposed root ball size on the ground. In general, the root ball 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.
- 4.17 For tussock grasses and other strap leaf plants, the root ball shall generally be twice the diameter of the base of the tussock.
- 4.18 Where soil is at risk of being lost during relocation, 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).

Lifting Techniques

- 4.19 Plants shall be lifted from their existing location and immediately placed in the pre-prepared planting holes.
- 4.20 Lifting of plants shall be carried out or supervised by a qualified and / or suitably experienced horticulturist and crane / machine operator.
- 4.21 Appropriate lifting equipment shall be used.
- 4.22 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

- 4.23 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 root ball is at the same level as the surrounding soil surface.

- 4.24 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.

Soil Additives

- 4.25 TerraCottem Universal or equivalent shall be installed at the time of planting in accordance with the manufacturer's recommended installation methodology and rates. Proposals to use alternatives to TerraCottem shall be submitted to the Principal for approval and shall be accompanied by appropriate supporting documentation. Approval for use of alternatives will be at the sole discretion of the Principal.

Watering Basin

- 4.26 A shallow watering basin capable of holding 10 litres of water shall be constructed around the perimeter of the root ball of each plant relocated.

Initial Watering

- 4.27 Immediately following planting, each plant shall be watered with 20 litres of clean potable water.

Reducing Water Loss

- 4.28 If nominated in the Drawings or Design Report, the foliage shall be lightly pruned to reduce transpiration.
- 4.29 If nominated in the Drawings or Design Report, an anti-transpirant shall be applied in a spray form prior to relocation. The Contractor shall be responsible for arranging the type and correct amount of anti-transpirant for each plant.

Marker Stakes

- 4.30 All relocated plants shall be identified with marker stakes. Marker stakes shall be hardwood stakes 750 mm long, 25 mm x 25 mm.
- 4.31 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.

Tree Guards

- 4.32 If tree guards are specified on the Drawings or in the Design Report, tree guards shall be Rigid Polypropylene Fluteboard (450 x 230 mm sides).
- 4.33 Tree guards shall be assembled and positioned around the plant in accordance with the manufacturer's instructions.
- 4.34 Support stakes shall extend 50 mm above the tree guard, and be driven a minimum of 250 mm into the ground.

Weed Mats

- 4.35 If weed mats are specified on the Drawings or Design Report they shall be Jutemat Biodegradable (750 – 800 gsm) 600 x 600 mm (or equivalent).
- 4.36 Weed mats shall be installed in accordance with the manufacturer's instructions.

Mulch

- 4.37 If stated in the Drawings or Design Report that mulch is required, 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, sawdust, plastic, and metal and shall have a low fines content.

- 4.38 Mulch available from the removal of other onsite vegetation shall only be used where and when stated in the Drawings or Design Report and as approved by the Principal.
- 4.39 Refer to the Drawings or Design Report for the mulch type. If not specified on the Drawings or Design Report, mulch shall have minimum 70 percent hardwood content.

Practical Completion of Plant Relocation

- 4.40 Practical Completion is the successful relocation of rescued plants in accordance with this Part. This shall constitute a **Hold Point**.

5 Maintenance

General

- 5.1 The Contractor shall maintain the relocated plants for the maintenance period nominated in the Contract.
- 5.2 A maintenance plan shall be submitted to the Principal within 2 weeks of Practical Completion.

Watering Relocated Plants

- 5.3 It shall be the Contractor's responsibility to ensure that all plants maintain growth and are free of water stress at all times.

Weed Control

- 5.4 An area of 1,200 mm diameter around all plants (including the area inside tree guards) shall be kept free of weeds by spraying with a knockdown herbicide (Roundup or equivalent) incorporating an herbicide marker. Roundup Biactive (or equivalent) 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 or within the plant's structure shall be hand-pulled. Disturbance to the soil shall be minimised as much as possible.

Pest / Disease Control

- 5.5 The Contractor is responsible for ensuring insect pests, fungus and diseases are controlled by means of appropriate treatments during the maintenance period.
- 5.6 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.
- 5.7 The Contractor shall recommend preferred methods of pest / disease control for the project, and chemicals and application rates to be used. Schedule L23 shall be completed by the Contractor as required during the contract period recommending preferred methods of pest / disease control for the specific project, and chemicals and application rates to be used.

Maintenance of Marker Stakes and Tree Guards

- 5.8 Where marker stakes or tree guards within the Extent of Works area indicated on the Drawings or in the Design Report 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

- 5.9 Where the weed mats within the Extent of Works area indicated on the Drawings or in the Design Report 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

- 5.10 The Contractor shall re-mulch with the mulch specified in the Drawings or Design Report 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

- 5.11 Follow-up fertiliser shall be applied in accordance with the Drawings or Design Report.

Removal of Marker Stakes and Tree Guards

- 5.12 Tree guards and marker stakes shall be removed at the end of the Maintenance Period or as directed by the Principal.

Plant Survival Rates

- 5.13 At a minimum, plant survival rates shall meet the following benchmark requirements:

Maintenance Year	Tubestock and General Nursery Stock Survival Rates (% survival)
Year 1	100%
Year 2	95%
Year 3	90%

6 Hold Points

- 6.1 The following is a summary of Hold Points referenced in this Part:

Document Ref.	Hold Point	Response Time
4.8	Notification of setting out on site.	3 working days
4.40	Practical Completion of Plant Relocation.	3 working days