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LANDSCAPE WORKS

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O.1 EXTENT OF WORKS

Works shall include but not be limited to the preparation of the site for planter beds including excavation, grassed areas, planting of trees, shrubs and ground covers, paved areas and timber retaining walls and trimming to the required finished levels and contours.

O.2 TREES TO BE RETAINED

Where existing trees are to be retained, the following works shall be carried out:

Trees to be preserved as indicated on the drawings are to be adequately protected from damage if required, watered for the duration of the contract.

If necessary, to protect trees, hand methods of excavation shall be undertaken.

- (a) The area within drip line shall be kept clear of all equipment, building materials and debris. Materials, equipment or debris shall not be lent against the trunks of trees.
- (b) Cut or fill operations shall not be permitted within the drip line of any trees to be retained.
- (c) The root system of nominated trees shall not be damaged. Removal of tree roots greater than 40mm in diameter shall require prior approval by the Superintendent.
- (d) When excavations are carried out in the vicinity of trees to be retained, use hand excavation to locate any roots. Clean cut with a saw, roots, which need to be removed before commencing machine excavation. Seal tree root cuts with "steriprune" or equivalent approved tree wound dressing.

Pruning of Existing Trees

The Contractor shall allow to carry out remedial pruning works to the existing trees within the work site. This work shall include the removal of dead, diseased or dangerous branches and the raising or thinning of the tree canopies to allow greater light penetration to the new shrub beds.

The procedure to be used shall be submitted by the Contractor to the Superintendent for review.

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O.3 EXCAVATION OF PLANTER BEDS AND LAWN AREAS

All planter beds and lawn areas shall be excavated and topsoil placed in a designated stockpile area. Planter beds shall be excavated a minimum of 300mm and lawns 75mm (compacted). These areas shall then be backfilled using approved topsoil as specified in Clause O.11.

O.4 CULTIVATION

Mechanically deep cultivate to a minimum depth of 200mm all planter beds and to 150mm all lawn areas prior to the placement of topsoil. All rocks greater than 50mm in size which are brought to the surface during this operation are to be removed from the site.

O.5 TOPSOIL

Site topsoil shall be used wherever possible. The Contractor shall confirm through tests described in Section K of the Specification, that the site topsoil has a grading and pH, which is suitable for the healthy growth of the nominated grass mix and all plant species specified in the plant schedule. The Contractor is responsible for creating a satisfactory growth medium.

The Contractor shall notify the Superintendent of any topsoil characteristic, which may reduce the performance of any plant species or grass mix.

Imported topsoil sufficient quantity of approved imported topsoil from a certified source shall be supplied and spread over the entire areas of planting beds and lawn areas indicated on the drawings. The soil shall be quality sandy loam from an approved soil supplier. The soil shall normally have a pH of 6.5 to 7.0 unless otherwise stated.

Soil sample and supplier details to be approved by the Superintendent prior to use.

The general depth of the topsoil shall be:

- 300mm planter beds.
- 75mm (compacted) lawn areas.

Imported topsoil and site topsoil shall be spread and compacted (to 90% of the maximum value obtained in the Standard Compaction Test in accordance with AS.1289 – 5.1.1 - 1993) but not over compacted, to the specified depth.

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O.6 TIMBER PLANTER BED EDGING

Supply and place 100mm x 25mm treated pine or 100mm x 12mm jarrah edging to planter beds as detailed and located on the landscape drawings. Timber shall be straight, free of warps, splits, splinters or other defects.

Where there is a requirement for beds of a radius of less than 3 metres, the timber shall either be scarped to allow an even bend or two layers of jarrah shall be used.

Provide and install 450mm x 75mm x 50mm hardwood stakes at 1200mm centres and nailed to planted bed edging using 50mm hot dipped galvanised nails.

O.7 PLANT MATERIAL

The plant stock shall be obtained from a nursery that specialises in the supply of plants propagated from seeds or cuttings from indigenous plants.

Plants shall be delivered to the site in a healthy condition and handled at all times in such a manner as to prevent damage in transit.

O.8 SETTING OUT

The Contractor shall set out the plant material in accordance with the planting plan.

Planting in large areas may be staged to ensure plants are not on-site in containers, for longer than 24 hours.

O.9 CONTAINER AND PLANT SIZES

Plant materials shall be supplied in sizes specified in the bill of quantities/landscape plans.

O.10 PLANTING CONDITIONS

Planting shall not be carried out if the soil is very wet and waterlogged or during periods of adverse or extreme weather or windy conditions.

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O.11 PLANTING PROCEDURE

Garden bed planting:

- (a) Saturate the plant before planting.
- (b) Place jute weed matting where indicated on plants.
- (c) Clear mulch 500 to 1000mm around the hole for replacement after planting.
- (d) Dig hole into the prepared plant beds at a sufficient overall size to provide not less than 75mm of approved site soil beneath and around the root system.
- (e) If the soil is very dry, fill with water and allow to drain completely.
- (f) Fertilise at the following rates:

PRODUCT	100 TO 150MM POT
Agriform (low phosphate) or equivalent Or	2 tablets
Osmocote (long life) (low phosphate) or equivalent Or	1.5 teaspoons (15 grams)
Magamp K (course grade) or equivalent	1.5 teaspoons (15 grams)

Place the fertiliser in the bottom of the hole and cover with soil to ensure there is no contact between the roots and fertiliser.

- (g) Place the plant into the hole and backfill with the approved topsoil.
- (h) Plants shall be set plumb and level with the adjacent soil - ensure no soil is placed against the stem of the root crown.
- (i) Form a “bowl” around the plant to hold at least:
 - Standard trees - 10 litres of water.
 - Tube stock - 1 litre of water.

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O.12 ADVANCED TREES

- (a) Tree Identity - trees shall be true to the genera, species and variety ordered.
- (b) Tree Form
- Each tree shall have a single straight central leader with no kink, bend or lean of greater than 15 degrees, and with a dominant apical bud.
 - Trees shall be shapely and well formed with a number of evenly spaced lateral branches along the length of the central leader. The shape and form of each tree shall be consistent with and typical of its species, and all trees of any one species ordered shall be of a consistently similar shape and form.
- (c) Tree Root Structure - each tree shall have a fibrous root system which is sufficiently well developed and evenly distributed within the container as to prevent collapse of the root ball when it is removed from the container but not so developed as to girdle the base or sides of the root ball or the main stem of the tree.
- (d) Growing Medium - trees shall be grown and supplied in a soilless growing medium, which complies with the Australian Standard for regular grade potting mix (AS.3743).
- (e) Tree Sizes - shall not be less than 1500 mm high and shall be stable in 300mm sized pots when any support stakes that may have been used are removed.

The ration of leaf cover to tree volume shall be consistent with and typical of the species.

They shall also be of a vigorous nature and have a healthy root system that shall not encircle the inside of the container.

- (f) Handling - Plants with a root ball may have their roots partially exposed to facilitate handling. Handling of the large container grown plants may only be done with a tree trailer and they are to be removed from the nursery and planted in a prepared hole in one operation.

No advanced trees shall be stored on site.

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O.12 ADVANCED TREES (cont'd)

- (g) Planting Procedures (Advanced Trees):
- (i) Thoroughly moisten plant roots before planting and soak all container grown stocks.
 - (ii) Dig hole of a sufficient size, with domed bottom to take root ball without restricting the root diameter. Minimum diameter 600mm.
 - (iii) If the soil is very dry, fill with water and allow to drain completely.
 - (iv) Cut back any roots that may have been damaged to healthy tissue.
 - (v) Fertilise at the following rates (advanced deciduous trees):

PRODUCT	100 TO 250MM POT
Agriform (low phosphate) or equivalent or	5 tablets
Osmocote (long life) (low phosphate) or equivalent or	12 teaspoons (100 grams)
Magamp K (course grade) or equivalent	12 teaspoons (100 grams)

- (vi) Planting - Spread roots of open rooted stock evenly in the hole. Place the tree into the hole to match level, as it is grown in the nursery. Place by tree trailer for advanced container grown stock.
- (vii) Staking - Allow to provide four (4) 38mm x 38mm x 2250mm hardwood stakes per Advanced Tree, set a minimum of 450mm apart to avoid root damage. Approved “webbing” type flexible ties shall be used to secure tree trunk to stakes. **Note:** Plant advanced trees initially without stakes and monitor tree stability to prevailing winds, before staking advanced trees.

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O.12 ADVANCED TREES (cont'd)

- (viii) Cover the roots with approved topsoil in layers of 150mm and lightly compact around the perimeter of the hole to ensure no air pockets and root ends bend downwards. Ensure roots are not pressed against the bottom of the hole due to too quickly backfilling or lumpy soil.

O.13 ROOT BARRIERS

All trees must have industry approved root barriers where absences of such barriers will likely cause damage to the surrounding infrastructure such as paving, kerbing fences and the like.

O.14 MULCH

Mulch must be produced to comply with AS 4454-1997 and as specified below.

Prior to placement and planting out of the plant material in all planter beds, the Contractor shall supply and spread approved mulch to an average depth of 75mm +/- 10mm). The mulch particle size shall be screened to a maximum of 20mm in any dimension. It shall be free from soil clods, rocks and all other non-organic matter. A sample is to be approved by the Superintendent prior to supply and delivery to the site.

Mulch to be approved by Superintendent prior to use.

Mulch to finished level with timber plinths after settlement allowances of the topsoil and mulch

In planter areas, the mulch shall be re-spread over the disturbed bed area. Keep mulch away from the trunks to avoid rotting at ground level.

In lawn areas, the mulch shall be placed after formation of the “water bowl”.

A 200mm wide X 150mm deep trench along the inside edge of the garden and backfilled with mulch shall be provided when the toe of a batter coincides with the edge of the garden.

O.15 WATERING

All plants shall be thoroughly watered-in immediately after planting and at such times during the Contract Period as is required to maintain growth free from water stress. Each plant shall require a minimum of 10 litres, for standard trees and 1 litre for shrubs and tube stock of water at the time of planting.

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O.16 SEEDED GRASS AREAS

- (a) Preparation - Following sub-surface cultivation and soil placement as specified in Clauses O.3, O.4, and O.5 the soil shall be graded to a smooth surface to ensure free surface drainage. All contaminated areas (injurious to plant life) shall be removed and disposed off site.
- (b) Conditions - Preparation and sowing operations shall be suspended if the soil is wet or during periods of adverse weather conditions.
- (c) Sowing (by hand, machine or tractor).

HP No sowing shall be undertaken without approval of the Superintendent.

- (i) The grass seed mix as specified in the landscape plans/documents shall be sown at 300 kg per hectare.
- (ii) At the time of sowing lawn seed, the soil shall be in a moist but not wet condition.
- (iii) Immediately before sowing, the area shall be lightly raked to give a loose surface on which to sow the seed. The seed shall be sown on a calm day.

Fertiliser is to be used and shall be a prepared mix of approved lawn seed starter fertiliser (NPK 10: 4: 6). The fertiliser shall be spread evenly at the rate of 300kg/hectare as part of the seeding operation.

After sowing, the seed shall be raked into the top 10mm of soil and watered with a fine mist spray.

- (iv) The seedbed shall be maintained in a moist condition to ensure unhindered germination and growth of sown species.

The Contractor shall allow for raking over and reseeded of any area where germination has failed to occur within on (1) month of the original date.

The first cut and any subsequent mowing during the maintenance period shall be carried out at intervals sufficient to maintain the grass height at 50 to 75mm (+/- 10mm) and a record kept of the mowing dates.

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O.17 HYDROSEEDING

(a) **Preparation**

The area to be hydroseeded shall be initially prepared as specified in Clause 0.16.

(b) **Fertiliser**

Fertiliser to be used shall be a prepared mix of approved lawn seed starter fertiliser (NPK 10: 4: 6). The fertiliser shall be spread evenly at the rate of 300kg/hectare as part of the seeding operation.

(c) **Seed Mix**

All grass seed shall be as specified in Clause 0.16.

(d) **Application**

All hydroseeding shall be carried out on calm days.

Sufficient seed shall be placed in a suitable hydroseeding machine to provide a seeding rate at least equal to that specified. The seed, fertiliser, pulp and water shall be constantly agitated during the seeding operation.

Seed shall be sown at the rate of 300kg/hectare. Sowing shall be performed by hydromulch method whereby seed, fertiliser and wood cellulose fibre are mixed and sprayed onto the prepared area at the following rate.

- | | |
|--------------|----------------|
| • Seed | 300kg/hectare |
| • Fertiliser | 300kg/hectare |
| • Woodfibre | 1500kg/hectare |

(e) **Establishment**

All areas of hydroseeding shall be maintained in a moist condition until satisfactory germination has occurred. This shall be achieved by applying the equivalent of a minimum of 6mm of rain in any period of 7 days. The Contractor shall determine the watering method he proposes to use. Satisfactory germination shall be determined by random sampling throughout the area.

After a satisfactory termination has been achieved, the seedlings shall be hardened off. This shall be done primarily by progressively decreasing the frequency and quantity of watering.

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O.18 PROTECTION

The Contractor shall protect all seeded grass areas with single strand wire and orange tape strung between 25 x 25mm steel star pickets to easily depict the extent of the protective/temporary twine fence.

O.19 TIMBER RETAINING WALLS.

The Contractor shall supply and install all materials and provide all necessary plant and equipment to complete all excavation, filling, if required, and backfilling including all fixtures and footings in the construction of timber retaining walls as shown on the Drawings and as specified.

O.20 TYPE OF TIMBER

Timber used in the construction of retaining walls shall be standard rough sawn A Grade Sleepers being Red Gum, Ironbark or Spotted Gum, all sizes specified are rough sawn dimensions. Alternatively and only if specified Treated Pine may be used. Excessively warped, split or other unsound timber shall not be used.

The standard size for horizontal timbers shall be 200mm x 75mm x 2400mm unless varied in the contract drawings.

The standard size for vertical upright timbers shall be 200mm x 75mm x required specification length for timber retaining walls up to and including 1000mm high.

The standard size for vertical upright timbers shall be 200mm x 100mm x required specification length for timber retaining walls exceeding 1000mm to 1400mm high.

O.21 FIXING DEVICES

All bolts, nails or other fixing devices shall be hot dipped galvanised, and as specified on the drawings.

O.22 SIZES OF HOLES

All holes for upright members shall be excavated to the sized and founding depths as indicated for:

Timber retaining walls to 400mm high
Embedment depth min 600mm
Hole size 400mm x 400mm

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O.22 SIZES OF HOLES (cont'd)

Timber retaining walls to 600mm high
Embedment depth min. 800mm
Hole size 400mm x 400mm

Timber retaining walls to 800mm high
Embedment depth min 1000mm
Hole size 500mm x 500mm

Timber retaining walls between 1000mm high to a maximum of 1200mm
Embedment depth min. 1200mm
Hole size 500mm x 500mm

Timber retaining walls exceeding 1200mm high to a maximum of 1400mm
Embedment depth 1400mm
Hole size 500mm x 500mm

and shall be free of any foreign material prior to the placement of the uprights. Where an obstruction is encountered in an excavated hole the Superintendent must be consulted before any modification to the position of an upright member is made.

O.23 SETTING OUT

The Contractor shall set out timber retaining walls to the line and position as indicated on the drawings and shall not later this without the prior consent of the Superintendent. Uprights shall be placed at standard 2.4 metre centres for the run of the wall with terminating ends at 2.2 metre centres unless otherwise indicated in the contract specification or drawings.

O.24 CONSTRUCTION DETAILS

In general timber retaining walls are to be constructed as to the details and specifications shown in the Drawings.

For timber retaining walls to a maximum height of 600mm upright members may be founded in a dry mixture of 1 part cement to 4 parts clean loam thoroughly mixed, rammed and consolidated around the upright members.

For timber retaining walls between the heights of 600mm - 1400mm upright members shall be founded in a mixture of Ready Mix Concrete (Foundation Mix) complying with AS 1379 with strength of 25 MPA and aggregate size to a maximum of 20mm.

For walls exceeding 1400mm timber retaining walls shall not be used.

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O.24 CONSTRUCTION DETAILS (cont'd)

Any variation from the above shall not be permitted without the consent of the Superintendent.

Timber uprights shall be laid back with a slope of 1 to 10 unless otherwise indicated in the Drawings with opposing faces plumb.

Horizontal members shall be bolted to the timber uprights with 200mm x 10mm galvanised coach bolts unless otherwise specified in a neat and regular fashion with all bolt faces equally spaced and straight in appearance.

O.25 COMPLETION OF WORKS

The Contractor on completing the construction timber retaining walls shall backfill the wall with compacted soil to within 75mm of the top of the wall if the retained area is to be mulched or to within 5mm of the top of the wall if the retained area is to be seeded down.

Following placement of backfill the area shall be raked to blend into the existing profile of the surface behind the timber retaining wall and to either side of the terminating ends. All timber off cuts and debris shall then be removed from the site.

O.26 MAINTENANCE AND ESTABLISHMENT

Maintenance and Establishment shall mean the care and maintenance of the works as well as rectifying any defects that become apparent in the works under normal use. This shall include, but shall not be limited to the following items:

- Watering
- Mowing
- Fertilising
- Weeding
- Re-Seeding
- Pest and Disease Control
- Maintaining Site Neat and Tidy
- Cultivation
- Pruning
- Aerating
- Renovating
- Top Dressing
- Staking
- Re-planting

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O.27 PLANTED AREAS

Throughout the duration of the maintenance period the planted areas shall be maintained in one of the following manners: -

- (a) Individual trees or shrubs - a weed free watering saucer of minimum diameter of 1 metre, except in irrigated lawn areas.
- (b) Planting beds - completely weed free surface within the surrounds of the bed.

The Contractor shall be responsible for the Maintenance and Establishment of all planting works.

O.28 GRASS AREAS

The Contractor shall maintain all grass areas by watering, weeding, re-seeding, rolling, mowing, top dressing, trimming or other operations as necessary.

O.29 WATERING

Grass, trees and garden bed areas are to be watered regularly so as to ensure continuous healthy growth. The minimum acceptable requirement for grass areas shall be 35mm of natural rainfall or its applied equivalent or a combination of both during each period of one week from 1 October, to 31 March. Acceptable requirement for trees and shrubs shall be 25mm of water during each period of one week.

O.30 WEEDING AND RUBBISH REMOVAL

Remove rubbish and weed growth that may occur or re-occur throughout the works. This work is to be carried out regularly so that at weekly intervals the area may be observed to be free of weeds and rubbish.

O.31 REPLACEMENTS

The Contractor shall replace, at no cost to the Council all plants and turf that are missing, unhealthy or dead. Replacements shall be of a similar size and quality and identical species or variety to the plant, which has failed, unless otherwise directed and replace immediately the plant is dead.

O.32 SOIL SUBSIDENCE

Any soil subsidence or erosion, which may occur after the soil filling and preparation operations, shall be made good.

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O.33 STAKES

The Contractor shall allow supplying and placing four (4) 38 x 38mm x 2250mm hardwood stakes per tree specimen, during the Maintenance and Establishment period if the prevailing site conditions require staking and are considered necessary by the Superintendent. Flexible ties shall be used to secure the tree trunk to the stakes, in a “figure eight” pattern. Wire, plastic covered wire ties, string and twine shall not be used.

O.34 PRUNING

Trees and shrubs shall be pruned as directed by the Superintendent. Pruning shall be directed for the maintenance of dense foliage, or miscellaneous pruning as beneficial to the condition of the plants. Any damaged growth shall be pruned.

O.35 COMPLETION

The Contractor shall remove all debris from the site and any material stored by the Contractor on or adjacent to the site and leave the area tidy.

Grass areas shall have a healthy and shrubs shall show signs of healthy fibrous growth. Trees shall be appropriately staked in dry land areas with a suitably sized water saucer intact and weed free.