SECTION 720 - LANDSCAPE WORKS

##This section cross-references Sections 176 (or 177), 204 and 750.

If any of the above sections are relevant, they should be included in the specification.

If any of the above sections are not included in the specification, all references to those sections should be struck out, ensuring that the remaining text is still coherent:

720.01 GENERAL

This section covers the requirements for works associated with the vegetation of the site. This includes, but is not limited to, material supply, site preparation, mulching, planting, grassing, irrigation and landscape maintenance as specified and shown on relevant Drawings, Planting Details and Schedules.

720.02 DEFINITIONS

(a) Caliper

The stem or trunk diameter of a tree at a nominated point. Caliper is measured at 300 mm above ground for sizing of nursery plants.

(b) Individual Tree Planting

Any tree planting of single trees each surrounded by a mulch ring and/or grass cover.

(c) Planting Area

Any continuous area where multiple plants are established using stock from containers such as pots, tubes and cells or by direct sowing (other than grassed areas).

(d) Propagule

A propagule is any plant part capable of producing a new plant (e.g. seeds, cuttings, bulbs, corms, rhizomes, etc.).

(e) Tube stock or cell stock

Plants grown in small (less than 0.5 litre) containers.

(f) Standard stock

Plants grown in medium (greater than 0.5 litre and less than 12 litres) containers.

(g) Semi-advanced stock

A container-grown plant that is supplied with a container or root ball size between 12 litres and 100 litres.

(h) Weed

Any plant which is not desired. Sub-categories include:

 (i) Noxious weed. Any plant listed as a weed for the project area under the *Catchment and Land Protection* (CaLP) *Act 1994*.

 (ii) Species or individual plants specified to be removed.

 (iii) Weeds of planting beds and around individual trees include any plant not specified in the planting schedule or is not indigenous to the site. This includes all local environmental weeds and noxious weeds.

 (iv) Weeds of mown-grass areas include all species listed in (i) above, broadleaf species (except broadleaf species specified for sowing) and other weeds where specifically listed.

 (v) Weeds of National Significance (WONS).

720.03 SUBMISSIONS AND RECORDS

The specified inspections, samples, records and certificates shall be made available or submitted to the Superintendent for acceptance prior to the commencement of associated work. Accepted samples shall become the agreed minimum standard and approved source of supply. The Contractor shall be responsible for programming all inspections and review of samples and allow 2 working days notice to the Superintendent. Samples, records and certificates shall be provided to the Superintendent at least 10 working days prior to bulk delivery.

\*\*\* **The Contractor shall provide the following before commencement of the relevant landscape work:** ##[strikethrough inapplicable items below]:

**Inspections**

· plant stock for all plant species

**Samples**

· mulch

· imported topsoil

· imported subsoil, site subsoil or inert materials

**Records**

· evidence of origin of indigenous provenance plant material

· statement of compliance from a suitably qualified and experienced arborist, horticulturist or landscape architect assuring that semi-advanced tree stock supplied comply with AS 2303 and project requirements and that other plant stock complies with Section 720.04

· analysis certificates for grass seed

· details of suppliers

· soil test certificate and accompanying statement of compliance from a suitably qualified and experienced soil scientist assuring that the soil is fit for purpose.

· statement from the supplier of composts, soil conditioners and mulches that states the means of demonstrating compliance with AS 4454

· copies of fertiliser labels

· weed and pest control personnel

· monthly records of herbicide use

· 6 monthly records of replanting including dated photographic evidence

720.04 SUPPLY OF MATERIALS

All materials shall be supplied by the Contractor unless otherwise noted. If any materials are supplied by the Superintendent, a joint inspection of the materials shall be made by the Contractor and the Superintendent following delivery of the materials to the site. The materials, if satisfactory, shall thereafter become the responsibility of the Contractor.

(a) General Supply of Plant Stock

 All plants shall be of the type, height, container size and trunk caliper specified in the Plant Schedules, Specification and Planting Plans. These are minimum requirements. No substitution of plants or reductions in container sizes shall be allowed without the written agreement of the Superintendent. The Contractor shall submit any alternative proposals to the Superintendent at least 20 working days prior to plant procurement to ensure time for the long-term asset maintainer to be engaged.

**Table 720.041 Plant Stock Supply Properties**

|  |  |
| --- | --- |
| **Property** | **Requirement** |
| General Requirements | All plants shall be hardened off for a minimum 4 weeks in conditions matching prevailing conditions on the Works site. |
| Species Integrity and Labelling | Plants shall be true to type and clearly labelled with at least one label per species per delivery batch. |
| Container Supply Sizes | Tube stock shall be at least 200 mL in volume. Cell stock shall be at least 93 mL in volume. Other sizes shall be as specified.  |
| Root Ball Occupancy | Roots shall be adequate to fill the container. Samples shall demonstrate that >85% of soil volume remains intact when the unsupported root ball is shaken. |
| Root Ball Integrity | Plants shall display a large, well developed and healthy fibrous root system with repeated and sequential division with no evidence of root curl, restriction or damage. The root ball shall not be pot bound and shall generally have roots penetrating to the edge of the pot. Except for monocots with fibrous root systems, plants with girdling, spiralling or j‑rooting present in root systems will not be acceptable. |
| Uniformity of Plant Growth | The size shall be in proportion to the container size and species. Tube stock and cell stock shall not have shoot height greater than 3 times the depth of the container. |
| Caliper | Trees shall be self supporting. |
| Health and Vigour | Plants shall show vigorous tip growth and foliage size, texture and colour consistent with that shown in healthy specimens of the species. Plants shall have undamaged limbs and trunk. |
| Free of Pests and Diseases | Plants shall be free from pests and diseases at time of delivery, with visible attack from previously eliminated pests and disease restricted to <10% of foliage such that long term success of the plant is not affected. |
| Weed Free | Plants shall be provided in containers free of weeds. |

(b) Supply of Semi-advanced Tree Stock

 Supply of semi-advanced trees shall conform to AS 2303. Tree stock balance shall comply with requirements in Appendix E of AS 2303. Container grown trees shall be grown in containers that are designed to prevent root circling (for example air pruned or copper treated containers).

**HP The Contractor shall make available semi-advanced tree stock for inspection at the nursery, 7 working days prior to delivery to site and provide 3 working days notice to the Superintendent.**

(c) Supply of Indigenous Plant Stock

 A species listed on the planting schedule shall be classed as an indigenous plant if the plant is likely to have occurred within 10 km of the project area (pre‑1750).

 The Contractor shall align with the combination approach of provenance mixing for climate change adaptation, when sourcing seed or plants, as outlined in The State of Victoria Department of Environment, Land, Water and Planning (2020) guideline (<https://www.environment.vic.gov.au/__data/assets/pdf_file/0036/489159/Revegetation-plant-provenance-information-sheet_final.pdf>). Where a distinct form of a species occurs naturally in the local area, that form shall be used. For the proportion of plant stock to be sourced from local provenance the following applies; the Contractor shall source seed or other propagules from within or as close to the project area as practicable, from areas within the same catchment, with similar soil type (same parent material) and rainfall (to minus 100 mm average recurrence interval). Seed shall be collected in accordance with Florabank Guidelines and Codes of Practice (<http://www.florabank.org.au/>). Further to these guidelines, seed and propagules shall not be collected more than 25 km from the project area without prior agreement with the Superintendent. The Contractor shall support these proposals to move material from greater distances with details of the extent of morphological differences between populations, methods of pollination and distribution, population size and geographic continuity. Widely distributed grasses and wetland species may be sourced up to 100 km from the project area in areas with the same soil type and similar or lower annual rainfall.

 The Contractor shall be responsible for obtaining all necessary native flora collection permits from the Department of Energy, Environment and Climate Action (DEECA).

 The Contractor shall submit documentation of origin of indigenous provenance plant material which shall include the following details for each seed lot:

 · species name

 · storage code

 · collection locality - Latitude/longitude or AMG

 · provenance approach (climate adjusted or local)

 · collection date

 · name, contact details and permit number of the collector

 · approximate number of parent plants sampled

 · approximate number of plants in that local population

 · parent soil material

 · site status (land owner, remnant, revegetation population)

 All seed lots of the same species collected at different localities shall be supplied as separate seed lots. The provenance shall be tracked through propagation to planting for possible future seed collection purposes.

 The format of the seed collection records shall be a spreadsheet compatible with Microsoft Excel.

(d) Supply of Site Topsoil

 Site topsoil shall be used wherever possible, in preference to imported topsoil. Topsoil is defined as the weathered surface layer of soils that includes organic matter. Site topsoil needs to be treated to remove unwanted matter, as per Table 720.073, before applying to Planting Areas and Grassing Areas.

 The Contractor shall be responsible for ensuring the growing medium supports normal healthy growth of the specified planting. The Contractor shall determine when soil testing is to be completed and what soil amendments and macro and micro nutrients are required to be added to the topsoil. A statement of compliance from a suitably qualified and experienced soil scientists shall be provided to ensure the soil is fit for purpose.

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

(e) Supply of Imported Topsoil

 In the event that site topsoil is not available or is not adequate to achieve the specified depth of topsoil, the Contractor shall supply imported topsoil to achieve the total specified depth of topsoil.

 Imported topsoil for on grade planting areas and grassing areas (except Type 2 Grassing Areas) shall comply with the following properties:

**Table 720.042 Imported Topsoil Supply Properties**

|  |  |
| --- | --- |
| **Property** | **Requirement** |
| General Requirements | Imported topsoil shall be suitable for supporting healthy plant growth of the specified and scheduled species. |
| Texture  | The texture shall either match the site topsoil texture or provide a light to medium friable sandy loam with a clay content 10‑15%, capable of handling when moist but lacking cohesion so that it will fall apart easily. |
| Extraneous Material and Contaminants | The topsoil shall be free of sods of subsoil, rubbish, petrol and oil contaminants, lime etc, and meet the requirements for ’Fill material’ in EPA publication *1828.2 Waste disposal categories – characteristics and thresholds* and shall have contaminant levels less than the concentration listed in Table 3 of that document.  |
| Large particles (naturally occurring) | Stones shall be <5% (by dry weight) with stone size not exceeding 25 mm. |
| Soil Nutrients | Adequate levels to support normal plant growth for the scheduled species. |
| Organic Matter (% dwb) | 2-5  |
| Weed Content and Pathogens | Soil shall meet AS 4419 5.4.2 and 8.2. No noxious weeds, noxious seed or *Phytophthora cinnamomi*. |
| Soil pH, 1:5 in water Rayment and Lyons 4A1 method  | 5.5 – 8  |
| Phosphorous Content (mg/kg) | P-sensitive plants | <10 (Colwell method, Rayment & Lyons 9B2)<30 (Mehlich 3 method, Rayment and Lyons 18F1) |
| Non-P sensitive plants  | 30-70 (Colwell method, Rayment & Lyons 9B240-80 (Mehlich 3 method, Rayment and Lyons 18F1) |
| Available Nitrogen (Ammonium and Nitrate) (mg/kg) | >20 |
| Electrical Conductivity (dS/m), 1:5 in water, Rayment and Lyons 3A1 method  | <0.5  |
| Dispersibility Category | 1 or 2 (AS 4419 Appendix J)  |
| Permeability (mm/h @ 16 drops McIntyre & Jakobsen)  | >50  |
| Toxicity | Soil shall meet AS 3743 |
| Exchangeable sodium (Na) % of ECEC | <7 (Leake & Haege 2014, D1 and D4 specification) |
| Exchangeable calcium (Ca) % of ECEC | 60-80 (Leake & Haege 2014, D1 and D4 specification) |
| Exchangeable magnesium (Mg) % of ECEC | 15-25 (Leake & Haege 2014, D1 and D4 specification) |
| Exchangeable potassium (K) % of ECEC | 3-10 (Leake & Haege 2014, D1 and D4 specification) |
| Exchangeable Ca:Mg ratio | 3-9 (Leake & Haege 2014, D1 and D4 specification) |

(f) Supply of Fertilisers

 Fertilisers for Type 1 newly grassed areas shall be N:P:K 10:4:6 with trace elements.

 Fertilisers for planting areas and individual trees shall be slow release with a 9‑12 month release period and suitable for the establishment of plant types, sizes and species specified in the plant schedule(s).

(g) Supply of Gypsum

 Gypsum (Calcium Sulphate) shall comply with the minimum specifications as laid out in the current Victorian Fertiliser Regulations. Only manufactured gypsum shall be used. Gypsum derived from recycled plaster board shall not be used. Sodium shall not exceed 1% by mass.

(h) Supply of Wood Mulch (Chipped or Shredded)

 All wood mulch shall be supplied, delivered, handled and applied in accordance with AS 4454.

 (i) Imported Wood Mulch

 Wood mulch shall comply with the following properties:

**Table 720.044 Shredded or Chipped Wood Mulch General Supply Properties**

|  |  |
| --- | --- |
| **Property** | **Requirement** |
| General Requirements | Mulch shall meet AS 4454, Table 3.1 for composted or pasteurised mulch. Mulch type shall have fibrous properties which 'interlock' the particles so that installed mulch is not blown away by wind. |
| Purity | Mulch shall be free of soil and weeds, plant pathogens, vermin and toxins. Plywood, composite timber product and painted timber shall not exceed a combined maximum of 1% by weight total. Mulch shall be free of treated pine, exposed sharp metal, plastic and other litter. |
| Sizing | In planting areas adjacent to high use pedestrian paths | In planting areas adjacent to either roads posted at <80 km/h, cycle paths, recreational open space or low use pedestrian paths | In planting areas adjacent to roads posted at ≥80 km/h |
| Meet AS 4454–2012, Table 3.1(A) for coarse mulch | 95% of particle size shall be no wider than 40 mm and no longer than 140 mm. No particles longer than 200 mm | 80% of particle size shall be no wider than 50 mm and no longer than 140 mm. No particles longer than 400 mm |

 (ii) Site Mulch

 Site mulch available from the chipping of on-site indigenous or non-weed vegetation shall be used where possible and where it adheres to highest and best repurposing timber strategies. The Contractor shall subject site mulch to a pasteurisation as per AS4454. Any species that could have weed potential by seed or vegetative fragments shall not be recycled in the landscape works. Mulch shall satisfy the purity and sizing requirements shown in Table 720.044.

(i) Supply of Weed Control Mat and Erosion Control Mat

 The Contractor shall supply and install jute or approved equivalent, biodegradable, fire retardant weed and erosion control mat as indicated on the Drawings or as specified. Weed Control Mat shall be minimum 700 grams per square metre and Erosion Control Mat shall be 300 grams per square metre. The surface of the mat shall permit water infiltration.

(j) Supply of Tree Guards, Stakes, Ties and Marker Stakes

 Tree guards shall be of adequate height to protect against the size of site-specific grazing animals and be a minimum 450 mm high. Tree guards shall be wood pulp,mesh or recyclable opaque plastic and of sufficient gauge and UV inhibitor to ensure a minimum two year life. Tree guard stakes shall be sufficiently robust to be driven into the ground, securely support the tree guards and ensure a minimum two year life.

 Stakes for semi-advanced trees shall be minimum 35 mm x 35 mm x 1800 mm, and of sufficient strength and durability to support the establishing tree for 2 years.

 Ties for semi-advanced trees shall be flexible, soft strapping and of a type which shall not detrimentally abrade or bruise the bark of the tree. Plastic covered wire, string hessian and twine are not acceptable.

(k) Supply of Type 1 Grass Seed

 Type 1 Grass seed shall comply with the following properties:

 **Table 720.045 Type 1 Grass Seed Properties**

|  |  |
| --- | --- |
| **Property** | **Requirement** |
| Species and Proportion | Low risk sowing time: March to September |
| Areas with greater than 700 mm average annual rainfall• Fine Leaf Perennial Ryegrass 20% by count• Perennial Ryegrass 50% by count• Creeping Red or Chewings Fescue 20% by count• Kentucky Bluegrass 10% by countAreas with less than 700 mm average annual rainfall. The Contractor shall select a mix from the two options below. *Option 1*• Perennial Ryegrass 25% by count• Toxicity Resistant Annual Ryegrass 35% by count• Cocksfoot 15% by count• Trikkala Subterranean Clover 25% by count*Option 2*• Winter Active Summer Dormant Tall Fescue 60% by weight• Early Heading Perennial Ryegrass 20% by weight• Hard Fescue 10% by weight• Annual Ryegrass 10% by weight |
| High risk sowing time: October to February |
| The Contractor shall have mitigation strategies in place if grass seed is sown during these high-risk months. The Contractor shall select a mix from the two options below. Alternatively, the Contractor shall advise the Superintendent in writing if the preference is to sow Type 3 Grass Seed to provide temporary cover and resow with Type 1 Grass Seed in a more favourable time of year for grass germination and establishment. *Option 1*• Perennial Ryegrass 60% by count• Creeping Red or Chewings Fescue 20% by count• Hard Fescue or Sheeps Fescue 20% by count*Option 2*• Winter Active Summer Dormant Tall Fescue 25% by weight• Summer Active Fescue 25% by weight• Early Heading Perennial Ryegrass 30% by weight• Annual Ryegrass 10% by weight |
| Minimum Seed Purity | 98% and shall not contain noxious weed seed |
| Minimum Germination Rate | 90% at date of supply |

 The quality and specified properties of all seed shall be analysed and certified by either:

 (i) endorsed in accordance with the AS ISO/IEC 17025 accreditation for the testing laboratory; or

 (ii) issued on *Seed Lot and Sample Certificates* by a laboratory accredited by ISTA (International Seed Testing Authority) to the ISTA *International Rules for Seed Testing.*

 The Contractor may choose to sow a hybrid mix of Type 1 and Type 2 Grasses (described below). The installation and performance requirements for Type 1 Grass Seed shall apply to any hybrid mix of Type 1 and Type 2 grasses, unless approved otherwise by the Superintendent.

(l) Supply of Type 2 Grass Seed

 Type 2 Grass seed shall consist of indigenous grass species as indicated on the Drawings or as specified. The Type 2 Grass seed mix shall contain the following:

* a minimum of 5 species.
* a mix of both C3 – cool season and C4 – warm season grasses, that are suited to the site and the relative proportion of each suited to the sowing time.
* a combination of pioneer and successional species to provide early germination and establishment as well as long term stability.

 The Contractor shall submit documentation of origin of indigenous provenance seed for seed collected from each indigenous grass stand which, in addition to the details listed in 720.04c, shall include:

* seeds of other plants, including useful native species.
* important weed seeds.
* number of normal germinating seeds.

 The quality of all indigenous grass seed shall be analysed for purity and viability. The indigenous grass seed shall not contain noxious weed seed. The percentage weight of weed species shall be recorded and the Contractor shall assess and confirm suitability of the seed purity prior to sowing. Seed quality tests shall be performed by independent certified seed testing laboratories within two months from the time of sowing. The sample tested shall be representative of the entire seed batch. Reporting provided shall include:

* percentage of pure seed units, inert material and contaminating seeds present as a weight percentage.
* percentage of the pure seed units that are viable, the method used to determine viability.

 If short term erosion protection is required at the site, the Contractor shall also sow low viability Rye-corn (*Secale cereale*) in the Type 2 grassing area. The Contractor shall determine the sowing rate based on the erosion risk and the need to not overly outcompete with the indigenous grass seed. The sowing rate used shall be recorded and supplied to the Superintendent on request. A minimum sowing rate of 5 kg/Ha shall be sown for a light cover and 15 kg/Ha for a dense cover.

(m) Supply of Type 3 Grass Seed (Low Viability Grass Seed)

 Low viability Rye-corn (*Secale cereale*) seed shall be used for the stabilisation of areas to be subsequently sown or planted and for stabilisation of temporary batters and stockpiles.

(n) Supply of Compost or Soil Conditioner

 All compost and soil conditioner shall be supplied, delivered, handled and applied in accordance with AS 4454.

720.05 PEST AND WEED CONTROL

(a) Pest and Weed Management Procedures

 The Contractor shall develop and implement site specific pest and weed management procedures to control pest and weed populations. The procedures shall consider pest animals, plants, fungi and other pathogens that may impede plant establishment.

 Weed management procedures shall include removal of weeds from their existing locations before, during and after site clearing, topsoil stripping and landscape works. Weed management procedures shall minimise the spread of weeds in topsoil to other locations within and outside the site.

 In addition to Sections 204 and ##176 (or 177): of the Department of Transport and Planning Standard Specifications for Roadworks and Bridgeworks, pest and weed management procedures shall include control of soil borne pathogens including, but not limited to *Phytophthora cinnamomi*, *Armillaria* sp. and soil borne weeds.

(b) General Requirements

 Pesticides shall be used in accordance with the manufacturer’s instructions. Where off‑label use of pesticides is considered desirable to achieve pest control requirements, the Contractor shall be responsible for the investigation and procurement of off-label permits. The Contractor shall advise the Superintendent in writing of any proposed off‑label pesticide use prior to pesticide application.

 Weed and pest control personnel shall be qualified and experienced in the use of pesticides, control of weeds, prevention of pesticide drift and identification of target and non target species found on site and included in the planting schedules. Personnel records must be submitted to the Superintendent at least 10 days prior to works occurring.

 The Contractor shall prevent runoff into waterways of pesticides not registered for use in waterways.

 Herbicides and pesticides applied as a spray shall include sufficient coloured dye to identify application areas for at least 5 days.

 If ‘non‑target’ areas or plants are damaged during weed control works, then the Contractor shall be responsible for the reinstatement of those areas to the satisfaction of the Superintendent.

 Records of herbicide use shall be submitted monthly to the Superintendent.

(c) Pre-Planting and Pre-Sowing Weed Control

 Pre-planting weed control shall be undertaken to ensure that planting areas and new grassed areas are free of visible weeds prior to the commencement of planting and grassing. Weed control shall be programmed and implemented to deplete the potential weed seed bank within the topsoil to be used in planting areas.

 (i) Type 2 Seeded Grassing

 Pre-sowing weed control shall be undertaken to ensure that the soil is free of weeds and weed propagules. The Contractor shall achieve pre-sowing weed control by using either of these methods:

* Scalping method. The topsoil layer shall be scalped to a minimum depth of 100 mm and to a depth where phosphorus levels (Colwell method) are below 15 mg/kg.
* Surface application method. A surface application of low nutrient and weed load subsoils or inert materials, that provides a suitable substrate for indigenous grass germination and establishment. The subsoil or substrate layer shall be a minimum 80 mm deep and have soil available phosphorus levels (Colwell method) below 10 mg/kg, available nitrate levels below 15mg/kg, pH 5.5 - 8.5, dispersibility category of 1 or 2 (AS 4419 Appendix J). A minimum period of one month is required after the surface application of the subsoil before sowing, to allow additional weed control of any emergent non-indigenous species.

 If one of the methods specified above cannot be achieved, the Contractor shall submit an alternative pre-planting weed control proposal with a statement of compliance from their native grassing specialist stating that it is fit for purpose, for approval by the Superintendent. This may include an extended weed control program for a minimum of 12 months using soil disturbance to promote frequent weed germination events followed by weed control methods, such as steam, solarisation or broad-spectrum, non-selective knockdown herbicide.

720.06 SETTING OUT OF LANDSCAPE SOFTWORKS

The Contractor shall set out the location and shape of planting areas in accordance with the Landscape Drawings.

The Contractor shall comply with the plant density requirements and planting offsets as shown in the plant schedule(s).

Individual plants shall be located in accordance with the drawings such that the mature form of the plant will be in accordance with the location of roadside hazards as per AGRD Part 6 and Supplements and sight distance requirements as per:

* AGRD Part 3 - Geometric Design ED 3.4,
* AGRD Part 4 – Intersections and Crossings General Ed2.2,
* AGRD Part 4A - Unsignalised and Signalised Intersections Ed3.2,
* AGRD Part 4B - Roundabouts Ed3.2,
* AGRD Part 4C - Interchanges Ed2.1,
* AGRD Part 6A - Paths for Walking and Cycling Ed2.1

720.07 SITE PREPARATION

Further to the requirements of Section 204, the Contractor shall provide the soil preparation described in Table 720.071. All elements of soil preparation proceed in order from left to right.

**Table 720.071 Soil Preparation Requirements**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Situation** | **Initial Ripping of Subsoil Prior to Topsoil Placement** | **Minimum Topsoil Depth** | **Cross Ripping** | **Cultivation** |
| Planting Areas in disturbed areas flatter than 3h:1v | Min 400 mm deep at max 500 mm spacing. Leave all batters with roughened subsoil to assist with keying of topsoil. | 150 mm | - | Min 150 mm deep |
| Planting Areas in disturbed areas steeper than 3h:1v | Min 300 mm deep at max 500 mm spacing, between parallel to and 45° from contour. Leave all batters with roughened subsoil to assist with keying of topsoil. | 100 mm  | - | - |
| Planting Areas in undisturbed areas | Min 400 mm deep at max 500 mm spacing | - | - | Min 150 mm deep |
| Type 1 Grassing in disturbed areas | Min 200 mm deep, 500 mm max spacing | 75 mm, except 100 mm in swales | Min 100 mm deep, 500 mm max spacing | - |
| Type 1 Grassing in undisturbed areas | - | - | - | Min 100 mm deep |
| Type 2 Grassing in disturbed areas using scalping method | Refer to 720.05 c for scalping requirements prior to ripping. Min 200 mm deep, 500 mm max spacing | No topsoil | - | Min 100 mm deep |
| Type 2 Grassing in disturbed areas using a surface application method | Min 200 mm deep, 500 mm max spacing | No topsoil. 80 mm of imported subsoil  |  | - |
| Type 2 Grassing in undisturbed areas | - | No topsoil.  | - | Refer to 720.05 c for scalping requirements prior to cultivation. Min 100 mm deep |
| Individual Tree Planting (including advanced trees) within grassed areas.The area of treatment is 25 m2 per tree. | Min 400 mm deep at 500 mm max spacing | 150 mm in disturbed grassed areas | Min 300 mm deep, max 500 mm spacing | ~~-~~ |
| **Notes:**• Disturbed areas include any area of cut batter, fill batter, site of excavation (including borrow pit), site of dumping (including fill mound), drains, swales or area driven over by machinery resulting in soil compaction. Disturbed areas also include any areas where topsoil is effectively absent or areas of soil with dry bulk density exceeding the maximum shown in Table 720.072.• Undisturbed areas are those areas with the pre-construction soil profile retained intact, without compaction or soil loss.• Initial ripping in granitic soils should be parallel to the contour.• Topsoil on grassed verge areas shall be left firm. |

(a) Soil Additives including Gypsum

 Soil additives, including any material used to modify the chemical properties of the soil, shall be applied by the Contractor prior to physical ripping and cultivation and in accordance with results and soil scientist recommendations from site soil analysis tests.

 The Contractor shall supply and install gypsum to the subsoil where subsoils are dispersive (AS 4419 Appendix J). The Contractor shall apply sufficient gypsum to ensure soils are not dispersive, incorporating gypsum during ripping to a minimum depth of 300 mm.

 The Contractor shall adjust the soil pH if the soil, including subsoil, to a depth of 300 mm is not in the range of 5.5-8 (1:5 water).

 Where salinity of existing (unmoved) site subsoil or topsoil is greater than 0.5 dS/m electrical conductivity using AS 4419 Appendix D method, the Contractor shall notify the Superintendent.

(b) Ripping

 The Contractor shall undertake any ripping specified. Ripping shall occur when soil is at or approaching the plastic limit of dryness. Ripping shall be postponed when the soil is at or wetter than field capacity. Narrow tines shall be used in rocky ground and winged tines in other ground types. Rock and rubbish brought to the surface shall be removed and disposed. The Contractor shall inform the Superintendent of sites where the presence of rock prevents the specified minimum ripping depth being achieved and implement alternative techniques (such as a standard tine) to maximise planting bed ground preparation depth.

 Ripping shall not occur within the extent of existing vegetation areas marked for protection or within the drip‑line of existing small woody plants. In the vicinity of trees to be retained the tree protection zone (as per AS 4419 or a modified TPZ as defined by the project consultant arborist with a minimum QTRA Level 5 qualification) shall be considered and marked as an area to be protected. Any planting to be carried out within these protected areas shall be done using hand cultivation techniques to minimise damage to existing tree roots zones.

 Where existing planting beds are to be extended, the unplanted areas shall be ripped as described above.

**HP The Contractor shall make available each ripped planting area, individual tree planting and grassing area prior to mulching, planting or grassing. The Contractor shall not proceed until the Superintendent acknowledges requirements for ripping have been met. In areas where ripping is not practicable, the Contractor shall submit alternative methods to achieve an equivalent result to the Superintendent for review.**

(c) Topsoil Application

 Following subsoil preparation, topsoil shall be spread on planting areas and grassed areas, except for Type 2 Grass Seeding areas. Topsoil shall not be compacted.

 Weedy site topsoil shall not be spread to other locations on the site. Weedy topsoil shall be handled in accordance with the Contractor’s weed management procedures.

(d) Cultivation

 Cultivation shall be undertaken to break soil down to a tilth with 80% of the volume composed of clods less than 50 mm in diameter. Cultivation equipment that might create a hard pan beneath the depth of cultivation (such as rotary hoes and other powered cultivators) shall not be used. In the event of saturated ground conditions, cultivation shall be delayed until the ground has dried out to a suitable condition. Where ripping and topsoiling is sufficient to allow easy manual excavation of soil to a depth of 300 mm or more, cultivation may be omitted.

 Cultivation shall not occur within the extent of existing vegetation areas marked for protection or the drip-line of existing woody plants. Hand cultivation shall be used within tree protection zones of trees to be retained.

(e) Topsoil Finished Surface Levels

 After cultivation and trimming, the Contractor may lightly compress topsoil for stability on slopes. Vibrating plates shall not be used. The Contractor shall ensure dry bulk density does not exceed the following:

 **Table720.072 Maximum Dry Bulk Density of Soils for Planting and Grassing**

|  |  |
| --- | --- |
| **Soil Texture**(as determined by AS 4419) | **Maximum Dry Bulk Density for Topsoils** |
| Clay soils | 1.3 g/cm3 (1.4 g/cm3 on slopes steeper than 3:1) |
| Loams | 1.5 g/cm3 |
| Sandy soils | 1.7 g/cm3 |

 The finished level of grassed areas shall be:

 (i) not higher than 125 mm below weep-holes or damp-proof courses in adjacent walls;

 (ii) level with the bottom of fence plinths;

 (iii) level with adjacent pavements, kerbs, pits and other structures.

 The finished level of garden bed mulch and/or topsoil shall be tapered so that the finished mulch and/or topsoil levels meet flush with the adjacent surfaces. The finished topsoil areas shall be smooth and even and free of large clumps, wheel ruts, undulations, or localised depressions.

 The Contractor shall ensure these conditions are maintained and there is no compaction of prepared soils before planting. If areas are re-compacted, the Contractor shall repeat the site preparation activities to ensure the conditions are suitable for plant establishment and growth.

**HP The Contractor shall make available each ripped, topsoiled and cultivated planting area, individual tree planting and grassing area prior to mulching, planting or grassing. The Contractor shall not proceed until the Superintendent acknowledges requirements for topsoiling and cultivation have been met. In areas where topsoiling or cultivation is not practicable, the Contractor shall submit alternative methods to achieve an equivalent result to the Superintendent for review.**

(f) Removal of Unwanted Matter

 The Contractor shall remove unwanted matter. Unwanted matter includes the following:

 **Table 720.073 Unwanted Matter**

|  |  |
| --- | --- |
| **Mown Grass Areas** | **Planting Areas** |
| • any weeds, plastic, metal, glass or material toxic to plants• surface stone, rock, building rubble, clay lumps, sticks and exposed tree roots greater than 25 mm in diameter | • any weeds, plastic, metal, glass or material toxic to plants• any visible surface stone, rock, building rubble greater than 50 mm in diameter• clay lumps, sticks and exposed tree roots greater than 75 mm diameter |

(g) Existing Planting Areas

 Existing planting areas shall exclude areas of naturally occurring remnant vegetation.

 Prior to undertaking site preparation or planting within existing plantations, all dead, severely damaged (<40% intact canopy) and fallen trees and shrubs shall be removed from the plantation. Woody weeds with any seed or vegetative material capable of regeneration are to be removed and disposed of off-site.

 Any severely pest affected vegetation that cannot be successfully treated using pesticides (or any other treatment) shall be removed and disposed of off-site. All remaining vegetation within the plantation is to be retained and protected from direct and indirect damage from ground preparation, weeding, mulching and infill planting.

 Remaining vegetation in the existing plantation shall be assessed for damaged, dead or diseased limbs and branches. All such limbs and branches on existing vegetation with a diameter greater than 50 mm in urban areas and 100 mm in rural areas are to be removed. All pruning works including dead-wooding, canopy uplifting and weight reduction shall comply with the requirements of AS 4373.

 **The Contractor shall obtain all necessary permits and obtain approval from the Superintendent prior to the pruning or removal of local native vegetation or other trees protected by planning law or regulations.**

720.08 MULCHING

(a) Wood Mulch (Shredded or Chipped)

 The Contractor shall install wood mulch to all Planting Areas unless otherwise specified. Mulch shall extend at least 1 metre beyond plant centres at the outer edges of all Planting Areas. If space does not permit this in median, separator or splitter-island planting, mulching shall extend to the back of kerb.

 The Contractor shall install 2 metre diameter mulch rings around all Individual Tree Plantings.

 Mulch depths in all situations shall be a minimum 75 mm and maximum 125 mm.

 Mulch shall be raked to an even, neat appearance and kept clear of plant stems to avoid collar rot.

(b) Weed Control Mat and Erosion Control Mat

 The Contractor shall install weed control mat for planting areas steeper than 2:1 and in planting areas prone to flooding or within 2 metres of waterways, swales, wetlands and sedimentation ponds or elsewhere as specified.

 Weed control mat and erosion control mat shall be laid and anchored in accordance with the manufacturer’s instructions.

720.09 PLANTING

(a) Planting

 The Contractor shall carry out planting so as to ensure healthy, vigorous growth of plants. In the event the specified plant is unlikely to be suited to the as‑constructed growing conditions, the Superintendent shall be notified.

 Holes in heavy soils or on batters shall be prepared so as to ensure adequate drainage.

 Holes shall not be left smooth sided in basalt or ‘plastic’ soils. Drill or auger hole diggers shall only be permitted where soils have been cultivated.

 Planting holes shall be backfilled with friable topsoil free of debris, rocks and clods greater than 50 mm in diameter.

 Further to the planting requirements above, for semi-advanced trees the Contractor shall excavate a basin shaped hole 3 times the diameter and the same depth as the container size. A rip line shall be added to the lower edge of basin to ensure the hole does not become waterlogged around the plant. Backfill for the planting hole is to be site topsoil wherever possible, in preference to imported soil.

 For semi-advanced trees, the Contractor shall loosely tie advanced trees to secure stakes with broad flexible ties. Staking and ties shall prevent the tree from wind damage but shall allow movement of the trunk. Stakes shall not be inserted through the roots of the new plant. At the time of planting, the Contractor shall remove any staking present that was used in the nursery process.

(b) Fertilising

 The Contractor shall fertilise plants where specified and/or identified by the Contractor’s soil analyses.

(c) Initial Watering

 The Contractor shall saturate each plant within 8 hours after planting. Cells and tubes shall be irrigated with a minimum 3 litres of water per plant. Other container sizes shall be irrigated with a volume of water greater than the container size.

 Under no circumstances shall any plant be planted into a dry planting hole (soil moisture at wilting point or drier). If the soil is dry, the planting hole shall be saturated with water prior to planting.

720.10 GRASSING

(a) Type 1 Seeded Grassing

 (i) General

 The Contractor shall seed grass to:

 • all areas indicated to be grassed using Type 1 seeded Grass on the Drawings, and

 • all areas disturbed by the Contractor which will not be a planting area or managed as remnant or restored indigenous vegetation.

 The Contractor shall notify the Superintendent if Type 1 Grass is shown on the drawings or specified to be planting adjacent areas of high quality native vegetation, prior to undertaking site preparation works.

 Type 1 Grass seed shall be sown at minimum sowing rates in Table 720.101, distributed evenly to achieve an even and dense grass cover.

 **Table 720.101 Type 1 Grass seed minimum sowing rates**

|  |  |
| --- | --- |
| **Application method** | **Minimum sowing rates (kg/Ha)** |
| Drilled | 100 |
| Broadcast | 200 |
| Hydroseeded or hydromulched  | 300 |

 Germination rate shall be minimum 80% cover within 8 weeks and 95% cover within 3 months of sowing. If germination has not been achieved in any grassed area within 8 weeks (except during December to March), then the area(s) shall be reseeded with the specified grass seed mix.

 (ii) Fertilising

 The Contractor shall apply fertiliser evenly over the prepared surface where specified and/or identified by the Contractor’s soil analyses.

 (iii) First Mow

 The Contractor shall carry out the first cut when at least 50% of the grassing area to be cut has grown to minimum 75 mm and maximum 150 mm height. Mow to a minimum height of 75 mm. Less than 1/3 the height of the grass shall be removed in the first cut.

(b) Type 2 Seeded Grassing

 (i) General

 The Contractor shall seed Type 2 Grass Seed at a minimum sowing rate of 20 kg/Ha, distributed evenly to achieve an even and dense grass cover. The sowing method shall ensure good seed and soil contact. If germination of the Type 2 Grasses is not evident, within each grassed area, within 16 weeks, the Contractor shall reseed the areas at the minimum sowing rate.

 (ii) Establishment Watering

 The Contractor shall undertake watering as required to ensure successful and even initial grass establishment.

 (iii) Biomass removal

 The Contractor shall undertake an annual slash to a minimum height of 200 mm to reduce biomass and the height of any low viability grasses sown with the mix.

720.11 LANDSCAPE MAINTENANCE

(a) Scope of Maintenance

 Landscape maintenance tasks shall begin prior to Practical Completion as specified in clause 720.11(d) and shall continue until the completion of the Defects Liability Period for the Whole of the Works or the Defects Liability Period of the landscape works, whichever is the latter.

\*\*\* Maintenance of the landscape work shall include the following tasks:

 (i) replanting

 (ii) weed control

 (iii) watering

 (iv) mowing/slashing

 (v) reseeding of seeded grass areas

 (vi) pest and disease control

 (vii) re‑mulching

 (viii) pruning

 (ix) maintaining the site in a neat and tidy condition

 (x) repair of elements associated with plant establishment and removal of non-permanent elements, such as tree guards, stakes, ties and watering basin products.

 (xi) repairs to erosion affected areas

 (xii) stockpile areas.

(b) Maintenance Program and Joint Inspections

\*\*\* The Contractor shall prepare and submit a maintenance program showing sufficient information to enable the landscape maintenance works to be evaluated and shall show as a minimum the following:

 • inspection visits during the period of maintenance. Each site shall be visited every 6 weeks as a minimum.

 • maintenance works during the period of maintenance including an outline of replacement planting and reseeding regime, watering and proposed pest and weed management activities. The program of weed management activities shall include weed species present on the site, timing or triggers for flowering, seed set and germination and responding timing of treatments to effectively control the weeds.

 • if any pest and disease control is required, then the Contractor shall submit a treatment program to the Superintendent prior to the works being undertaken.

 Quarterly joint inspections shall be undertaken each year by the Contractor and the Superintendent after commencement of the Defects Liability Period.

 Any remedial work shall be performed within four weeks of the date of inspection. Grassing and planting may be delayed until suitable conditions prevail subject to the agreement of the Superintendent.

(c) Plant Performance Requirements

 The Contractor shall ensure that 95% cover is maintained in Type 1 and hybrid Type 1 & 2 Grassing Areas throughout the duration of the maintenance period, from the period of three months after sowing.

 Type 2 Grassing Areas with less than 50% grass cover (for each grassed area) at 12 months after Practical Completion shall be re-sown by the Contractor at the original sowing rate. The sowing technique used shall not adversely impact Type 2 grasses that are present. If the Contractor’s native grassing specialist recommends that alternative grassing types or planting should be undertaken, this shall be brought to the attention of the Superintendent, at least 15 working days prior to sowing. The Superintendent will direct whether these areas should be treated using a different landscape technique. If Type 1 Grassing is added, the Contractor shall ensure that 95% grass cover is achieved within 3 months from sowing and is maintained throughout the remaining duration of the maintenance period.

 Type 2 Grassing shall achieve a minimum of 80% grass cover (for each grassed area) at 24 months after Practical Completion.

 Shrub and groundcover planting bed areas shall achieve the following performance requirements:

**\*\*\* Table 720.111 Performance Requirements for Shrub and Groundcover Planting Areas**

|  |  |
| --- | --- |
| **12 months after Practical Completion** | **24 months after Practical Completion** |
| • minimum ##:40% ground closure  | • minimum ##:80% ground closure |
| • all plants showing healthy growth | • all plants showing healthy growth |
|  | • 80% of the plants in the Planting Area have been planted for at least 9 months. The Superintendent may request dated evidence to demonstrate this.  |
| • minimum 90% survival rate for each species, including approved substitutions during the DLP  | • minimum 90% survival rate for each species, including approved substitutions during the DLP |

 Planting that does not meet the above performance requirements shall be re-mulched and replanted to 100% of the original planting density for the area of planting area gaps. The Contractor may increase the planting density to ensure ground closure performance requirements are met.

 Individual trees and trees within planting areas shall achieve the following performance requirements:

**Table 720.112 Performance Requirements for Tree Planting**

|  |  |  |
| --- | --- | --- |
| **Requirement** | **Tube stock / Cell Stock and Standard Stock**  | **Semi-advanced Trees** |
| Minimum Tip Extension Growth  |
|  | Previous 12 months rainfall  |
| > 700 mm | 750 mm per annum | 300 mm per annum |
| 500 – 700 mm | 500 mm per annum | 200 mm per annum |
| < 500 mm | 400 mm per annum | 100 mm per annum |
| Percentage of canopy dieback and chlorosis (Leers, Moore and May 2018) | <5% | <5% |
| Stable in the ground at 24 months after Practical Completion | - | No trunk movement in the rootplate (Burnley method) |
| Structure and directed plant growth | Sound structure | Sound structure. For trees planted close to roads or road infrastructure, cycle and pedestrian paths, evidence that formative pruning has been undertaken.  |
| Minimum time since planting for replanted trees (at 24 months after Practical Completion) | 4 months | 12 months  |

 Tree planting that does not meet the above performance requirements shall be replaced to achieve 100% of the original specified planting numbers.

 Planting that does not meet the performance requirements because of soil conditions, the site shall be re-prepared, including any soil amelioration required based on follow up soil testing that have resulted in inadequate performance, and replanted at the Contractor’s expense.

(d) Maintenance Tasks

 The Contractor shall maintain the works as follows in accordance with the requirements of this specification, the drawings and plant schedules.

 (i) Noxious Weeds and Weeds to be Removed

 Eradication of noxious weeds and weeds to be removed over the whole site shall commence from the date of Possession of Site. The weed eradication targets shall be achieved within six months of Possession of Site and then shall be maintained.

\*\*\* The Contractor shall eradicate:

 • all state prohibited weeds

 • all regionally prohibited weeds

 • all regionally controlled weeds

 • any Weeds of National Significance (WONS)

 • any priority weeds identified in the local Catchment Management Authority Weed Action Plan

 (ii) Mown Grass Weed Control

 Weeds within new grass areas are to be managed from the time of the first site preparation element.

 Mown grass shall be maintained to control broad leaf herbaceous and woody weed populations. Weed control shall be implemented to control broad-leaf weeds that exceed 10% cover in urban areas or 20% cover in rural areas. Weed control shall occur prior to the weed plant reaching flowering.

 Areas of native broadleaf cover among mown grass shall be brought to the attention of the Superintendent prior to spraying. The Superintendent will direct whether these areas shall be treated.

 Bare ground that results from weed control activities shall be cultivated and re-grassed to establish a minimum 95% grass cover.

 (iii) Infrequently (annual) Mown Type 2 Grass Weed Control

 Weeds within new grass areas are to be managed from the time of the first site preparation element.

 Mown grass shall be maintained to control high risk grassy weeds, broad leaf herbaceous and woody weed that exceed 10% cover. Weed control shall occur prior to the weed plant reaching flowering or being of sufficient size to outcompete the specified grass species, as determined by the native grassing specialist.

 Areas of native broadleaf cover among these grassing areas shall be brought to the attention of the Superintendent prior to spraying. The Superintendent will direct whether these areas shall be treated.

 Bare ground that results from weed control activities shall be re-grassed with Type 2 Grass Seed to establish a minimum 80% grass cover.

 (iv) Weed Control in Planting Areas and Individual Tree Plantings

 Weeds within planting areas and around tree plantings are to be managed from when cultivation of the planting site is complete.

 All planting areas shall be managed by the Contractor to maintain a minimum of 90% weed free surface with no weeds taller or broader than 200 mm at all times and all weeds are to be removed prior to the production of viable seed. Weeds within Individual Tree Plantings are to be managed for a radius of not less than 1.5 metres at each planting location.

 (v) Pest Animals and Diseases

 The control of pests and diseases shall begin before the first planting.

 The Contractor shall provide protection to plants from vertebrate grazing animals. All planting killed by grazing animals shall be replaced. If more than 5% of planting in a planting area shows signs of damage by grazing animals, the Contractor shall inform the Superintendent in writing and take immediate action to prevent further grazing damage. As a minimum the Contractor shall immediately install tree guards or suitable protective fencing securely around all plants subject to vertebrate grazing. The Contractor shall ensure all replacement planting in these areas are adequately protected from vertebrate grazing.

 Where chemical repellents are to be used to prevent grazing, the repellent shall be applied until the growing tip of the plant is beyond the grazing height of the pest animal, subject to the approval of the Superintendent.

 The Contractor shall maintain all plants free of insect infestation and plant disease so that healthy, vigorous plant growth is sustained. Minor infestations of native pests and diseases on indigenous plants not threatening survival or healthy growth need not be controlled.

 (vi) Replanting

 Maintenance for replanting shall begin as soon as planting has begun in a planting area.

 Plants which die or do not achieve the specified growth and performance requirements in Section 720.11 c shall be replaced and replanted at the Contractor’s expense.

 The Contractor shall program and allow for any required site re-preparation and the propagation and supply of plants for any replanting during the current or next available planting season if the current conditions are not suitable for plant establishment.

 The Contractor shall submit replanting records with dated photographic evidence to the Superintendent, every 6 months, to assure against the requirements in Table 720.111. The records shall include species, numbers and container sizes and accompanying evidence of any approved substitutions.

 (vii) Watering

 The Contractor shall water all plants as necessary to ensure continued healthy and vigorous growth from time of planting. The Contractor shall be responsible for the supply and access to any mains water via fire hydrants and shall obtain the relevant permits for access to an approved recycled water facility or hydrant access.

 For semi-advanced tree stock, unless otherwise directed, the Contractor shall supply the following weekly waterings for each year of the maintenance period:

* For areas with more than 700 mm average annual rainfall - 24 weekly waterings (from mid-October to April)
* For areas receiving 700 mm or less average annual rainfall - 36 weekly waterings (from August to April)

 Any variations to the irrigation schedule will not be made without negotiation with and approval of the Superintendent. During periods of high rainfall, the watering may be suspended for a week or two, and additional watering provided during drier, warmer parts of the watering period. These additional waterings may be added at the end of summer, or during periods of extremely hot weather, when trees would benefit from additional watering. The Contractor shall indicate to the Superintendent any sites that are poorly drained or where planting holes are at risk of waterlogging.

 At each watering the Contractor shall deliver:

* a minimum of 5 L and up to 16 L of water to 12-16 L container stock
* a minimum of 15 L and up to 45 L of water to 45 L container stock
* a minimum of 25 L and up to 75 L of water to 75 L container stock
* a minimum of 33 L and up to 100 L of water to 100 L container stock

 Watering volume and pressure shall be such as to fill the watering basin (created by either a berm of soil or a water well product) and thoroughly wet the root ball and the backfill soil without water running off from around the planting hole, or the area around the planting hole being eroded. Watering shall be carried out using a variable pressure nozzle so that pressure may be reduced to match the infiltration of the root ball and the back fill soil.

 (viii) Grass Mowing ##(specification writer to strikethrough one of the following and delete this comment):

\*\*\* Mowing of all grass areas shall commence from Possession of Site.

\*\*\* Mowing of all grass areas shall commence from the earlier of sowing or road opening to traffic.

 In addition to areas grassed by the Contractor, the Contractor shall maintain all other grassed areas within the limits of work in accordance with Routine Maintenance Specification RM511 – Grass Mowing, Section 750 of Standard Specification for Roadworks and Bridgeworks.

 (ix) Re‑mulching

 Maintenance of areas mulched shall begin from the first planting.

 Areas mulched with shredded wood mulch that do not have full foliage cover at ground level shall be maintained at a minimum consolidated depth of 75 mm by the Contractor. Re‑mulching is not required where shrub or groundcover canopies have fully connected foliage.

 (x) Pruning

 Pruning maintenance shall begin from the first planting.

 The Contractor shall prune trees and shrubs to remove damaged branches with a diameter over 10 mm. Trees with codominant stems and included bark branches shall be selectively pruned to improve safety and structure of the tree. All pruning and removal of living or dead stems greater than 10 mm diameter, other than coppicing, shall be in accordance with AS 4373 Pruning of Amenity Trees.

 The Contractor shall assess all semi-advanced tree stock and undertake required formative pruning within 6 months prior to Final Completion. Formative pruning shall comply with the aims of AS 4373 Clause 7.2.5, including remove or address structural defects and direct growth to reduce encroachment or conflicts with built infrastructure as the tree grows.

 The Contractor shall undertake any coppicing, as specified for multi stem form or to create dense canopies to exclude weeds, during Autumn or Spring and, if the pruning technique is part of an ongoing landscape management treatment, within 6 months prior to Final Completion.

 (xi) Maintaining the Site in a Neat and Tidy Condition

 At any time the site is accessible to the public, the Contractor shall keep the site in a neat and tidy condition free of litter, debris or extraneous materials not associated with the works. Litter that may be carried from the site by wind or water shall be controlled, collected and removed by the Contractor from Possession of Site.

 (xii) Maintenance of Tree Guards, Stakes, Ties and Watering basins

 Maintenance of tree guards, stakes, ties and watering basins shall begin from installation.

 Tree guards and watering basins shall be maintained by the Contractor to ensure healthy vigorous plant growth is not inhibited. Tree guards shall be removed when the plant reaches 750‑1000 mm in height. Plastic tree guards shall be reused or recycled.

 Marker stakes shall be removed when the plant reaches the height of the stake.

 Any non-permanent elements associated with plant establishment, such as tree guards, stakes, ties and watering basin products, including for existing trees not planted by the Contractor, shall be removed prior to Final Completion of the Contract unless otherwise directed by the Superintendent.

 (xiii) Repairs to Erosion Treated and Affected Areas

 Maintenance and repairs to erosion treated and affected areas shall begin from the earlier of installation of treatment or erosion occurring. Treatment of erosion affected areas present at the time of Possession of Site shall commence within a timeframe that reflects the erosion risk and not greater than 6 months after that date.

 The Contractor shall maintain all areas of erosion protection treatments from the earlier of installation of treatment or erosion occurring and shall repair all damage or erosion which arises. Such areas shall be re‑prepared and re‑protected as necessary to minimize erosion occurring and to establish a stable condition.

 (xiv) Intervention Standards

\*\*\* In addition to the above requirements, the Contractor shall maintain the landscaping works in accordance with Routine Maintenance Category Level ##1: of the Intervention and Rectification Standards specified in Section 750 of the Department of Transport and Planning Standard Specification for Roadworks and Bridgeworks for:

 • RM411 – Surface Drains and Verges

 • RM511 – Grass Mowing

 • RM512 – Edge Trimming

 • RM513 – Grass and Weed Control

 • RM515 – Tree and Shrub Management

 • RM517 – Noxious Weed Control

 • RM822 – Litter Control