AUS-SPEC

Infrastructure Specifications

0250 Landscape – Combined (Minor Works)

0250 LANDSCAPE – COMBINED (MINOR WORKS)

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide landscaped planting, as documented.

Performance

Plants: Grown to a standard that allows rapid establishment and growth to maturity.

Maintenance: Encourage and maintain healthy growth for the duration of the contract.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0136 General requirements (Construction).*
- ~~*0171 General requirements.*~~

Application: This worksection is applicable to 'soft' landscaping work of a scale or size that does not warrant the use of separate worksections for each aspect of landscaping work included. As such, it combines relevant clauses from the following NATSPEC stand-alone landscape worksections: 0251 Landscape – soils, 0252 Landscape – natural grass surfaces, 0253 Landscape – planting, 0254 Irrigation and 0255 Landscape – plant procurement.

Limitations

Exclusion: This worksection is not intended to apply to works within the scope of the following:

- *0257 Landscape (road reserve and street trees)*. That worksection applies to landscaping within existing and future public road reserves, for example as part of subdivision works.

1.3 INTERPRETATION

Definitions

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

- Imported topsoil: Similar to local natural soil, suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and of contaminants, and classified by texture to AS 4419 Appendix K Table K1, as follows:
  - . Fine: Clay loam, fine sandy clay loam, sandy clay loam, silty loam, loam.
  - . Medium: Sandy loam, fine sandy loam.
  - . Coarse: Sand, loamy sand.
- Plant establishment period: The period between the date of practical completion and the end of the defects liability period.
- Site topsoil: Natural soil, excavated from the site, that contains organic matter, supports plant life, conforms generally to the fine-to-medium texture classification to AS 4419 and is free from the following:
  - . Stones more than 25 mm diameter.
  - . Clay lumps more than 50 mm diameter.
  - . Weeds and tree roots.
  - . Sticks and rubbish.
  - . Material toxic to plants.

1.4 SUBMISSIONS

Certification

Plant species: Submit the supplier's certification as evidence that plants are true to the required species and type and free from diseases, pests and weeds at time of delivery.

Operation and maintenance manuals
General: Submit recommendations and completion records for maintenance of plants, to *0259 Landscape – maintenance* worksection.

Products and materials
Supplier's data: Submit supplier's data including the following:

- Material source of supply for topsoil, filling, stone and filter fabrics.

Samples
General: Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Bulk materials: At least 5 working days before bulk deliveries, submit a 1 kg sample of each type documented with required test results.

Subcontractors
General: Submit names and contact details of proposed suppliers and evidence of the following, if appropriate:

- Experience in the required type of work.
- Production capacity for material of the required type and quantity.
- Lead times for delivery of materials to the site.

1.5 INSPECTION

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

- Witness Point: Subgrades cultivated or prepared for placing topsoil.
- Witness Point: Topsoil spread before planting.
- Witness Point: Grassing bed prepared before turfing, seeding, or temporary grassing.
- Witness Point: Grassing or turfing completed.
- Hold Point: Plant holes excavated and prepared for planting.
- Witness Point: Plant material set out before planting.
- Witness Point: Planting, staking and tying completed.
- Hold Point: Completion of planting establishment work.

2 PRODUCTS

2.1 TOPSOIL

Standard
Site and imported topsoil: To AS 4419.

Potting mixes: To AS 3743.

Composts, soil conditioners and mulches: To AS 4454.

Source
General: If the topsoil of documented quality cannot be provided from material recovered from site, provide imported topsoil.

Imported topsoil
General: Provide imported topsoil, as documented.

Imported topsoil particle size table (% passing by mass)

Sieve aperture (mm)	Soil textures		
	Fine	Medium	Coarse
2.36	100	100	100
1.18	90 – 100	90 – 100	90 – 100
0.60	75 – 100	75 – 100	70 – 90
0.30	57 – 90	55 – 85	30 – 46
0.15	45 – 70	38 – 55	10 – 22

Sieve aperture (mm)	Soil textures		
	Fine	Medium	Coarse
0.075	35 – 55	25 – 35	5 – 10
0.002		2 – 15	2 – 8

Imported topsoil nutrient level table

Nutrient	Unit	Sufficiency range
Nitrate-N (NO_3)	mg/kg	> 25
Phosphate-P (PO_4) – P tolerant	mg/kg	43 - 63
Phosphate-P (PO_4) – P sensitive	mg/kg	< 28
Phosphate-P (PO_4) – P very sensitive	mg/kg	< 6
Potassium (K)	mg/kg	178 - 388
Sulphate-S (SO_4)	mg/kg	39 - 68
Calcium (Ca)	mg/kg	1200 - 2400
Magnesium (Mg)	mg/kg	134 - 289
Iron (Fe)	mg/kg	279 - 552
Manganese (Mn)	mg/kg	18 - 44
Zinc (Zn)	mg/kg	2.6 - 5.1
Copper (Cu)	mg/kg	4.5 - 6.3
Boron (B)	mg/kg	1.4 - 2.7
Method References pH in H_2O (1:5), pH in $CaCl_2$ (1:5) and Electrical Conductivity (EC) by Rayment & Higginson (1992) method 4A2, 4B2, 3A1 Soluble Nitrate-N by APHA 4500 Soluble Chloride by Rayment and Lyons 2011 modified method 5A2 Extractable P by Mehlich 3 – ICP Exchangeable cations – Ca, Mg, K, Na by Mehlich 3 – ICP Extractable S by Mehlich 3 – ICP Extractable trace elements (Fe, Mn, Zn, Cu, B) by Mehlich 3 - ICP		

Notes to table: The **Topsoil nutrient level table** based on sufficiency levels, and the following commentary was prepared for NATSPEC by the Sydney Environmental and Soil Laboratory. The method references have been provided for each of the nutrients because interpretation changes depending on the method (i.e. some methods extract more, some less and some the same). Internationally, soil testing has swung towards the Mehlich 3 method because it is a true multi-extractant method with significant commercial advantages. Methods such as Colwell P, Olsen P, Ammonium Acetate, DTPA, etc. are all good methods but their origins lie in research facilities where commercial imperatives don't exist. Mehlich 3 allows for rapid determination which improves turnaround times and reduces cost.

Site topsoil

General: Provide site topsoil, as documented.

Soil blend: If required, stripped natural soil with sand and/or organic matter and recommended ameliorants.

2.2 GRASS

Seed mixtures

Description: Fresh, clean, uncoated new seed, thoroughly pre-mixed with a bulking material such as safflower meal.

Unacceptable seed: Wet, mouldy or otherwise impaired.

Purity (minimum): 98%.

Germination viability (minimum): 86%.

Age (maximum) from date of harvest: 2 years.

Handling: Deliver to the site in bags marked to show weight, seed species and supplier's name.

Turf

Description: Cultivated turf of even thickness, free from weeds and other foreign matter.

Supplier: A specialist grower of cultivated turf.

2.3 FERTILISER

General

Type: Proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or supplier, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.

Application rate: Vary the application rate to allow for the plant-available immediate fertilizer equivalence value of the soil conditioning compost.

Guidance: The plant-available fertilizer content of the selected compost must be considered as a substitute for the inorganic fertilizers. The rate of inorganic fertilizer must be reduced to account for the immediate fertilizer value of the compost, applied at the nominated rate. Failure to do so may result in toxicity to phosphorus-sensitive plants, leaf and root burning in salt-sensitive plants, and/or an increased risk of root disease due to nutrient imbalance.

Fertiliser schedule

Fertiliser key	Location	N:P:K ratio	Application rate

Notes to schedule:

Location: Refer following example.

N:P:K (Nitrogen:Phosphorus:Potassium) ratio and application rate: N:P:K ratios and application rates vary greatly depending on conditions of use. The following are for example only. Obtain specialist advice. Proprietary fertilizers meeting the requirements may be documented. Consult manufacturers for suitable application rate.

Location	N:P:K ratio
Hydroseeding	11:34:11
Temporary grassing	10:4:6
Turfing	8:7:5 average
Grassing at time of sowing	11:34:11
Grassing after germination	10:4:6
Stolonized areas	11:34:11
Planting beds	63:18:28
Individual plants	Prolonged release type
Slopes and open drains	80:36:20

2.4 PLANTS - GENERAL

Supply

Supply trees to AS 2303 and with the following properties:

- Stress: Free from stress resulting from inadequate watering, excessive shade or excessive sunlight experienced at any time during their development.
- Site environment: Grown and hardened off to suit anticipated site conditions at the time of delivery.
- Pests and disease: Free from attack by pests or disease.
- Native species with a history of attack by native pests: Restrict plant supply to those with evidence of previous attack to less than 15% of the foliage and make sure actively feeding insects are absent.

Labelling

General: To AS 2303 clause 4.2.1.

Label type: To withstand transit without erasure or misplacement.

Label frequency: As documented, and if not documented, every pot or punnet or tray containing only the same species.

Root system

Requirement: Supply plant material with a root system that is:

- Well proportioned in relation to the size of the plant material.
- Conducive to successful transplantation.
- Free of any indication of having been restricted or damaged.

Root inspection: If inspection is by the removal of soil test, such as investigative inspection, sample as follows:

- For > 100 samples: Inspect 1%.
- For < 100 samples: Inspect 1 sample.

Sample plants: Replace plants used in investigative inspection.

Defective samples: Reject the entire lot or line represented by the defective sample, or perform additional inspections to isolate the cause and affected individuals. Treatment to correct minor defects only, before planting, may be accepted at the discretion of the Superintendent.

Rejection: Do not provide root bound stock.

2.5 IRRIGATION

General

Requirement: Provide automatically controlled, fixed irrigation systems, as documented.

System type: As documented.

Coverage (mm of water over area to be delivered in each water period): As documented.

Watering period: As documented.

Control (e.g. moisture sensor or timer): As documented.

Backflow prevention: To meet statutory requirements.

Irrigation controllers

Type: Automatic controllers that are easily programmed and include the following:

- Manual cycle and individual control valve operation.
- Manual on/off operation of irrigation without loss of program.
- ≥ 4 on/off cycles per day.
- Day omit.
- 240 V input and 24 V output capable of operating 2 control valves simultaneously.
- ≥ 24 hour battery program backup.
- Power surge protection.
- Mounted in a lockable cabinet of minimum IP 54 to AS 60529 in external locations.

Micro-irrigation systems

Tubing: Polyethylene micro-irrigation pipe.

Emitter type (e.g. dripper, mini sprinkler, microspray, spray jet): As documented.

Drip systems

Integrated drip line systems: Tubing with integral drippers inserted into the tube during manufacture.

Discrete drip emitter systems:

- Tubing: Polyethylene micro-irrigation pipe.
- Drippers: Turbulent flow types, easily dismantled for cleaning. Connect directly into piping or provide appropriately sized micro-tubes.

Fittings

Type: Barbed fittings rated for the pressure class of the pipe, fastened with ratchet type clamps.

Valve boxes

Requirement: Provide the following in each valve box:

- Automatic control valve.
- Isolating valve.

- Filter:
  . Micro-irrigation systems: 200 µm.
  . Drip irrigation systems: 100 µm.
- Pressure-reducing valve with 170 kPa outlet pressure.

Construction: UV-resistant high impact plastic with high impact snap lock plastic cover.

3 EXECUTION

3.1 PREPARATION

Weed eradication

Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the maximum application rate.

Manual weeding: Regularly remove weed growth by hand throughout grassed, planted and mulched areas. Remove weed growth from an area of 750 mm diameter around the base of the trees in grassed areas. Continue weeding throughout the course of the works and during the planting establishment period.

Vegetative spoil

Disposal: Recycle or reuse by chipping or mulching and stockpiling onsite. Remove vegetative spoil from site if it is not appropriate for recycling. Do not burn as this will destroy soil bacteria and generate emissions.

3.2 ROCK WORK

Existing rock

General: Protect existing rock, rock shelves and rock outcrops from mechanical damage, surface defacement and other works.

Rock surfaces: Report damage or defacement occurring to any rock faces during the course of the works.

Restoration: Apply matching cement grout and bagging with colouring oxides, or encourage algae growth (by applying a blend of natural yoghurt, egg and cream or prepared powdered milk), to suit surrounding existing rock faces and vegetation environment.

Replacement: If restoration is not feasible, repair the rock face with replacement rocks from site or imported rocks of similar type.

New rock work

Erosion control: Bury rock two thirds by volume, with weathered faces exposed. Protect the weathered faces from damage.

Site rock: Stockpile for future placement and accessibility for lifting. Dispose of other rock off site.

Imported rock: Provide rock which has been selected before delivery.

Placing rock: Place while ground formation work is being carried out, as documented.

Placed rock schedule

Source	Rock type and description	Size (mm)

3.3 EARTH MOUNDS

Construction

Placing: Place clean fill in layers approximately 150 mm thick compacted to 85% of the dry density ratio of the surrounding soil tested to AS 1289.5.4.1. Minimise slumping and further compacting.

Edges: Construct changes in grade over a minimum width of 500 mm to smooth, gradual and rounded profiles with no distinct joint.

Existing trees: Maintain the natural ground level under the canopy.

Pipes, culverts and associated structures: Construct mounding to avoid unbalanced loading.

Drainage: Construct mounds to allow free drainage of surface water and to eliminate ponding.

3.4 SUBSOIL

Ripping

General: Rip parallel to the final contours. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.
- Heavily compacted clay subsoil: 450 mm.
- Ripline planting areas: As documented.

Planting beds

Excavated: Excavate to reduce the subsoil level to at least 300 mm below finished design levels. Shape the subsoil to fall to subsoil drains, if required. Break up the subsoil to a further depth of 100 mm.

Unexcavated: Remove weeds, roots, rubbish and other debris. Reduce the planting bed level to 75 mm below finished design levels.

Cultivation

Minimum depth: 100 mm.

Cultivation depths (mm):

- Grassed areas (seeded, turf, strip turf, stolonized): As documented.
- Planting areas: As documented.

Services and roots: Do not disturb services or tree roots. If required, cultivate these areas by hand.

Cultivation: Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

Additives

General: Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil as documented.

Gypsum: Incorporate at the rate of 0.25 kg/m^2.

Subsoil additives schedule

Location	Additive type	Additive rate

Herbicides

General: Before spreading topsoil apply a herbicide treatment as follows:

- Product: As documented.
- Location: As documented.

3.5 TOPSOIL

Placing topsoil

Spreading: Spread the topsoil on the prepared subsoil and grade evenly, making allowances, if appropriate, for the following:

- Required finished levels and contours after light compaction.
- Grassed areas finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Steep batters: If using a chain drag, make sure there is no danger of batter disturbance.

Finishing: Feather edges into adjoining undisturbed ground.

Consolidation
General: Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Topsoil depths
General: Spread topsoil to the following typical depths:

- Excavated planting areas:
  . For organic mulch: 225 mm.
  . For gravel mulch: 250 mm.
- Irrigated grassed areas generally: 150 mm.
- Irrigated grassed areas, heavy use (e.g. playing fields, playgrounds, and public parks): 200 mm.
- Non-irrigated grass areas: 100 mm.
- Earth mounds:
  . Mass planted surfaces: 300 mm.
  . Grassed surfaces: 100 mm.
- Top dressing: 10 mm.

Surplus topsoil
General: Spread surplus topsoil on designated areas on site or dispose off-site.

Designated areas: As documented.

3.6 GRASS SEEDING

Preparation
General: If a prepared area becomes compacted before sowing can begin, rework the ground surface before sowing.

Application
Ambient conditions: Do not sow in periods of extreme heat, cold or wet or when wind velocities exceed 8 km/h or if frost is likely before the grass is established.

Method: Evenly distribute the seed using purpose-made sowing machinery. Lightly rake the surface to cover the seed.

Rolling: Roll the seed bed immediately after sowing.

- Roller weight (maximum):
  . Clay and packing (heavy) soils: 90 kg/m width.
  . Sandy and light soils: 300 kg/m width.

Reseeding: If germination has not occurred within one month, reseed the sown areas.

Reseeding mixture: To match original seed mixture.

Watering
Before germination: Water the seeded area with a fine spray until the topsoil is moistened to its full depth. Until germination, keep the surface damp and the topsoil moist but not waterlogged.

After germination: Water to maintain a healthy condition, progressively hardened off to the ambient climatic conditions.

Initial establishment
General: Maintain sown areas until there is a dense continuous sward of healthy grass over the whole of the seeded area, evenly green and of a consistent height.

Protection: Protect the newly sown areas against traffic until established.

Protection method: Full height temporary fencing in areas prone to grazing livestock or wildlife, or delineation affixed to posts (e.g. star pickets and bunting or para-webbing) in other areas.

Weeding: Remove weeds from the sown areas. If required, spray with a selective herbicide for broad leafed weeds. Do not spray grass seeded areas within 3 months of germination.

Fertilising after germination: As follows:

- Six weeks after germination: Spread fertiliser evenly over the sown area and water in. Do not apply fertiliser to wet grass.
- Ten weeks after grass germination: If the planting establishment period occurs during the summer months, spread pelleted sulphate of ammonia at the rate of 250 kg/ha.

3.7 TURFING

Supply

Elapsed time: Deliver the turf within 24 hours of cutting, and lay within 36 hours of cutting. Prevent turf from drying out between cutting and laying. If not laid within 36 hours of cutting, roll turf out on a flat surface with the grass up, and water as required to maintain a good condition.

Application

Method: Lay the turf as follows:

- Stretcher bond pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- Finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.

Strip turf: Close butt the end joints and space the strips 300 mm apart. Lay top dressing between the turf strips. Finish with an even surface.

Tamping: Lightly tamp to an even surface immediately after laying. Do not use a roller.

Stabilising on steep slopes: Peg the turf to prevent downslope movement. Remove the pegs when the turf is established.

Watering

General: Water immediately after laying until the topsoil is moistened to its full depth. Maintain moisture to this depth.

Initial establishment

General: Maintain turfed areas until there is a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.

Failed turf: Lift failed turf and replace with new turf.

Levels: If levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

Top dressing: Mow the established turf and remove cuttings. Lightly top dress to a depth of 10 mm. Rub the dressing into the joints and correct any unevenness in the turf surface.

3.8 PLANTING

General

Plant location and spacing: If necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

Planting conditions

Weather: Do not plant in unsuitable weather conditions, including extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering

Timing: Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Preparation

Individual plantings in grassed areas: Prepare for planting as follows:

- Excavate a hole twice the diameter of the root ball and at least 100 mm deeper than the root ball.
- Break up the base of the hole to a further depth of 100 mm.
- Loosen compacted sides of the hole to prevent confinement of root growth.

Ripline planting: Prepare for planting as follows:

- Rip the row and excavate a plant hole for each plant large enough to accept the root ball plus 0.1 m^3 of backfilling with topsoil.
- Clear weeds and other vegetative material within 300 mm radius of the plants.
- If planting holes are excavated by mechanical means, increase the hole size by 100 mm and loosen compacted sides to prevent confinement of root growth.

Placing

General: Place plants as follows:

- Remove the plant from the container with minimum disturbance to the root ball. Make sure that the root ball is moist.
- If required, root prune to make sure all circling roots have been either severed or aligned radially into the surrounding soil.
- Place the plant in its final position, in the centre of the hole and plumb, and with the topsoil level of the plant root ball level with the finished surface of the surrounding soil.

Fertilising

Pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

Application rate (kg/ha): As documented, or otherwise as per manufacturer's recommendations.

Backfilling

General: Backfill with topsoil mixture. Tamp lightly and water to eliminate air pockets. Make sure that topsoil is not placed over the top of the root ball, so the plant stem remains the same height above ground as it was in the container. Avoid mixing mulch with topsoil.

Watering basins for plants in grassed areas

Location: To each individual plant not located in irrigated grassed areas or naturally moist areas.

Watering basin: Construct around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L.

3.9 IRRIGATION

Micro-irrigation systems

General: Connect micro-tube laterals with proprietary push in or screw in fittings.

Drippers: Connect directly into piping or provide appropriately sized micro-tubes.

Microsprays: Mount microsprays 300 mm above ground on stakes and connect to the piping with appropriately sized micro-tubes.

Piping: Lay polyethylene micro-irrigation pipe on finished ground surface under planting bed mulch and anchor at 1.5 m maximum intervals with U-shaped stakes.

Air release valves: Provide at the highest point in each section to drain the system when flow stops.

Drip systems

Piping: Lay polyethylene micro-irrigation pipe on finished ground surface under planting bed mulch and anchor at 1.5 m maximum intervals with U-shaped stakes.

Air release valves: Provide at the highest point in each section to drain the system when flow stops.

3.10 MULCHING

Placing mulch

General: Place mulch to the required depth and clear of plant stems, so that after settling it conforms to the following:

- Smooth and evenly graded between design surface levels.
- Flush with the surrounding finished levels.
- Sloped towards the base of plant stems in plantation bed.
- For gravel mulches: Not closer to the stem than 50 mm.

Extent: Provide mulch to 750 mm diameter to surrounds of plants planted in riplines and grassed areas.

Depths:

- Organic mulch: 75 mm.

- Gravel mulch: 50 mm.

Installation:

- In ripline and grassed areas: Place mulch to 750 mm diameter around plants.
- In mass planted areas: Place after the preparation of the planting bed but before planting and other work.
- In smaller areas (e.g. planter boxes): Place after the preparation of the planting bed, planting and other work.

Mulching schedule

Mulch key	Location	Mulch type	Depth (mm)	Stabilisation method

Notes to schedule:

Use the schedule only to provide information not shown on the drawings or documented in the worksection.

Mulch key: Use the key to relate the specification to the drawings. Delete if not required.

Location: e.g. Watering basins of individual plantings, Mass planting areas, Garden beds.

Mulch type: and Depth:

Brush chippings and leaf litter: 75 mm.

Pine flake: 75 mm.

Pine bark: 75 mm.

Chipper waste: 75 mm.

River gravel (state size): 50 mm.

Select the types with regard to local availability, proposed use, and prevailing conditions (slope, wind, etc.).

Materials such as leaf litter, pine flake and pine bark require stabilisation (i.e. meshing) on slopes greater than 1:3. Materials such as river pebbles and gravels are not suitable for use on slopes greater than 1:6.

3.11 TREATMENT

General

Insect attack or disease: If evidence of insect attack or disease of plant material is discovered, immediately give notice.

Physical removal

General: Remove insect infestation and diseased plant material by hand if appropriate.

Pesticide

Product: Spray with insecticide, fungicide or both as required, but not in sensitive areas (e.g. sensitive ecological communities, or aquatic or wetland environments, or where children may play) and only in accordance with any Council restrictions.

3.12 STAKES AND TIES

Stakes

Material: Hardwood, recycled plastic or steel pickets, straight, free from knots or twists, pointed at one end.

Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

Stake sizes and quantities: If not documented:

- For plants ≥ 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.
- For plants 1 to 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.

- For plants < 1 m high: One 38 x 38 x 1200 mm stake per plant.

Ties

General: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant. Attach ties loosely so as not to restrict plant growth.

Tie types:

- For plants ≥ 2.5 m high: Two strands of 2.5 mm galvanized wire neatly twisted together, passed through reinforced rubber or plastic hose, and installed around stake and stem in a figure of eight pattern.
- For plants < 2.5 m high: 50 mm hessian webbing stapled to the stake.

Trunk protection

Collar guards: 200 mm length of 100 mm diameter agricultural pipe split lengthways.

3.13 ESTABLISHMENT

Planting

Requirement: Make sure the general appearance and presentation of the landscape and the quality of plant material at date of practical completion is maintained for the planting establishment period.

Plant replacement: Replace failed, dead and/or damaged plants at maximum 3 weekly intervals as necessary throughout the plant establishment period.

Pruning: To AS 4373 and as documented.

Fertilising: Apply either an all purpose fertiliser or a 12 month slow release fertiliser, in two rows and cultivated into soil to a depth of 100 mm.

- Program: September and March according to seasonal growth requirement.

Weeding: Remove unwanted broadleaf plants and grasses considered invasive to the locality.

Remulching: Maintain the original ground levels around the base of plants.

Watering: Minimum 3 complete waterings, soaking to a depth of 150 mm at fortnightly intervals for the first 6 weeks of plant establishment irrespective of natural rainfall.

Grass surfaces

Preparation: Remove litter and fallen branches before mowing.

Mowing:

- Grass height: Consistent with the growth habit of the grass variety and maintained at 25 mm to 40 mm throughout the year. Do not remove more than one third of the grass height at any one time.
- Program: Weekly during the mowing season, November to March, and at fortnightly intervals from April to October. Do not mow during wet conditions.
- ~~Clippings: Remove grass clippings from the site after each mowing.~~
- Raking: Once every month before mowing from November to March, rake the grass with a flexible rake. On alternate mowings, adopt a north-south and east-west pattern.

Weeding: Remove unwanted broadleaf plants and grasses considered invasive to the locality.

- Program: Quarterly, and as required to maintain the general lawn condition.

Edge trimming: At the same time as mowing, trim lawn edges to plant beds, pathways, base of trees and other obstacles. Do not damage trees and shrubs.

Topdressing for established lawns: Weed-free imported sandy topsoil to a depth of 5 mm.

- Program: The spring following initial establishment.

Fertilising: Apply lawn fertiliser at the completion of the first and last mowings of the plant establishment period, and at other times as required to maintain healthy grass cover.

3.14 COMPLETION

Irrigation

Requirement: On completion of the irrigation system, carry out the following:

- Flush system thoroughly, check heads, sprays and drippers and clean if blocked.
- Clean strainers.
- Adjust for even distribution with no dry areas.

Cleaning

Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

4 SELECTIONS

The use of these schedules in addition to project Drawings on Council or private development works is optional, at the Superintendent's discretion.

4.1 TOPSOIL

Imported topsoil schedule

Property	**A**	**B**	**C**
Type			
Bulk density (kg/L)			
Texture			
Soil pH			
Organic content by mass			
Plant sensitivity to phosphorus			
Fertiliser (N:P:K)			
Fertiliser application rate			
Product			
Source			

Notes to schedule:

A, B, C: These designate each instance or type or location of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

Type: Select from:

- Low density soil, for planting on slabs or constructed planters.
- Organic soil for planting on grade.
- Soil blend for planting on grade.
- Top dressing.

Bulk density (kg/L): To suit soil type:

- Low density soil: > 0.7.
- Organic soil: . 0.6.
- Soil blend: > 0.3 to 0.6.

Texture: Refer to **Definitions** and select from the following:

- Fine.
- Medium.
- Coarse.

Soil pH: Vary requirements of AS 4419 clause 5.2 if appropriate for the project.

Organic content by mass: Select from the following values as typical to AS 4419 clause 5 and AS 1289.4.1.1, or vary as appropriate to the project:

- Low density soil: 10% to 40%.
- Organic soil: 15% to 25%.
- Soil blend: 3% to 15%.

Plant sensitivity to phosphorus: Select very sensitive or moderately sensitive. See AS 4419 Appendix M.

Fertiliser (N:P:K) and Fertiliser application rates: N:P:K ratios and application rates vary greatly depending on the conditions of use. Obtain specialist advice. Proprietary fertilisers meeting the requirements may be named if desired. Also refer to the **Fertiliser schedule**. If nothing is stated in the schedule, follow the manufacturers' recommendations.

Product or source: Nominate supplier.

Site topsoil schedule

Property	**A**	**B**	**C**
Type			
Bulk density (kg/L)			
Texture			
Soil pH			
Organic content by mass			
Fertiliser (N:P:K)			
Fertiliser application rate			
Plant sensitivity to phosphorus			

Notes to schedule:

A, B, C: These designate each instance or type or location of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

Type: Select from:

- Natural soil to AS 4419 clause 4.6.
- Soil blend to AS 4419.
- Bulk density (kg/L): > 0.7.

Texture: Refer to **Definitions** and select from the following:

- Fine.
- Medium.
- Coarse.

Soil pH: Vary requirements of AS 4419 clause 5.2 if appropriate for the project.

Organic content by mass: 15% to 25% or vary as appropriate for the project.

Fertiliser (N:P:K) and Fertiliser application rates: N:P:K ratios and application rates vary greatly depending on conditions of use. Obtain specialist advice. Proprietary fertilisers meeting the requirements may be named if desired. Also refer to the **Fertiliser schedule**. If nothing is stated in the schedule, follow the manufacturers' recommendations.

Plant sensitivity to phosphorous: Select very sensitive or moderately sensitive. See AS 4419 Appendix M.

4.2 GRASSING

Grass seeding schedule

Property	**A**	**B**	**C**
Seed species			
Application rate			
Sowing method			

Property	A	B	C
Mowing height (mm)			

Notes to schedule:

A, B, C: These designate each instance or type or location of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

Seed species and Application rate: Refer to NATSPEC TECHnote DES 028 for typical examples. Identify and describe each of the grass seed mixes to be used in the project, whether for sowing, hydroseeding, temporary grassing, etc.

Sowing method: Specify any particular requirements additional to those in the worksection, or delete this column. The method may comprise broadcast sowing in two transverse directions, or row sowing, etc, depending on the equipment used and the conditions.

Mowing height: Different for non-irrigated and irrigated grasses. 30 mm for stoloniferous grasses, 75 - 150 mm for species with coarse growth, such as oats or rye. Mowing may not be possible on steep banks and may not be desirable where seed mix includes species with coarse growth.

Turfing schedule

Property	A	B	C
Species or variety			
Minimum thickness			
Turf roll size (mm)			
Mowing height (mm)			

Notes to schedule:

A, B, C: These designate each instance or type or location of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on drawings.

4.3 PLANT MATERIAL

Plant material supply schedule

Botanical name	Common name	Size	Quantity (+10%)

5 REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS 1289		Methods of testing soils for engineering purposes
AS 1289.5.4.1	2007	Soil compaction and density tests - Compaction control test - Dry density ratio, moisture variation and moisture ratio
AS 2303	2018	Tree stock for landscape use
AS 3743	2003	Potting mixes
AS 4373	2007	Pruning of amenity trees
AS 4419	2018	Soils for landscaping and garden use
AS 4454	2012	Composts, soil conditioners and mulches
AS 60529	2004	Degrees of protection provided by enclosures (IP Code)

AS 1289		Methods of testing soils for engineering purposes
AS 1289.4.1.1 content of a soil - Normal method	2019	Soil chemical tests - Determination of the organic matter
NATSPEC DES 028	2012	Grass seeding and turfing

6 ANNEXURE M – MIDCOAST COUNCIL SPECIFIC CLAUSES

M1.	Variations to or non-conformances with Council's AUS-SPEC are to be evaluated with reference to the procedure in Council's *Development Engineering Handbook*. Acceptance is to be obtained in writing from: a) an authorised representative of Council's Director of Infrastructure and Engineering Services, or b) an accredited certifier where they are the Principal Certifier and hold the relevant accreditation category for the type of work.	**Variation procedure**
M2.	This specification applies in addition to any development consent (DA) conditions. If there is any inconsistency, the conditions of consent shall prevail.	**DA conditions**
M3.	Refer to the MidCoast Council *Development Engineering Handbook* for final inspection, works-as-executed and handover requirements.	**Completion**

7 AMENDMENT HISTORY

0	14/12/2020	First Published