

Appendix 8 Landscape

CO25000276 A90/A937 Laurencekirk Junction Improvement Scheme

Landscape Specification


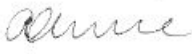
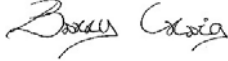
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1.Executive Summary

This specification should be read in conjunction with landscape design Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001 produced for the A90/A937 Laurencekirk Junction Improvement Scheme.

This specification includes general site information and requirements for tree planting, bulb planting and grassland enhancement and other associated requirements for the A90/A937 Laurencekirk junction improvement landscape design.

It should be read in conjunction with Manual of Contract Documentation for Highways Works, Volume 1 Specification for Highways Works, Series 3000 Landscape and Ecology.

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2. Appendices to Series 3000

2.1. Appendix 30/1: Landscaping General

Action Number	Sub-Clause Reference	Specification Amendment
1	3001.2	<p>The Company shall give the Overseeing Organisation at least 48 hours' notice of the following items in sub-clause 3001.2.</p> <ul style="list-style-type: none"> a) Spreading and checking depths of topsoil; b) All works in the vicinity of water courses or water features, including setting out of all planting around SUDs ponds; and c) Checking tree pits, including inspection of backfill material and incorporation of any additives
2	3001.3	<p>Peat or peat-based products shall not be used, except where peat is excavated on Site.</p> <p>Should peat be found on site, store in separate stockpiles and mix back into backfill material for scrub areas and tree pits.</p>
3	3001.13	<p>Pesticides records forms as detailed in Appendix 30/1, detailing information as required in sub-clause 3001.12, shall be submitted to the Overseeing Organisation on a monthly basis.</p>
4	3001.14	<p>The bird nesting period for this Agreement shall be from March 31st to July 31st inclusive.</p> <p>Damaging or destroying the nest of a wild bird (whilst being built or in use) is an offence under the Wildlife and Countryside Act 1981. Therefore, any clearance of felling of vegetation, in which birds are nesting, should be undertaken outside the breeding season.</p> <p>The bird nesting period for this Agreement shall be from March 1st to August 31st inclusive, unless otherwise agreed in writing with SNH.</p> <p>The Contractor shall not apply any netting or other means to prevent nesting out with the bird nesting period.</p> <p>Should the Contractor require to undertake any works during the breeding season, the Contractor shall be responsible for undertaking all necessary ecological surveys, watching briefs to determine the presence or otherwise of nesting birds within associated scrub and trees and these shall be carried out by appropriately qualified persons. Only when the required surveys demonstrate the absence of nesting birds, and approval from the Overseeing Organisation has been confirmed, can the works proceed and in doing so shall take full cognisance of any special measures identified within the ecological surveys.</p>

Action Number	Sub-Clause Reference	Specification Amendment
5	3001.15	<p>Landscape inspection reports on a form as detailed in this Appendix 30/1 shall be submitted to the Overseeing Organisation for the activities carried out under Clauses 3007 Grass, Bulbs and Wildflower Maintenance, 3009 Establishment Maintenance for Planting, 3010 Maintenance of Established Trees and Shrubs and 3011 Management of Waterbodies at the following intervals:</p> <ul style="list-style-type: none"> a) In the case of activities carried out under Clauses 3007 and 3011 four times per year; and b) In the case of activities carried out under Clause 3010 once per year <p>In the case of activities carried out under Clause 3009</p> <ul style="list-style-type: none"> c) Six times per year in the first year of the Establishment Period; d) Four times per year in the second year of the Establishment Period; and e) Three times per year for the remainder of the Establishment Period.
6	Inserted Clause	<p>The contractor shall give the Overseeing Organisation advance notice that he will be undertaking the following operations:</p> <ul style="list-style-type: none"> a) Setting out; b) Application of herbicides; c) Pruning; and d) Otherwise.

Appendix 30/1 Landscaping: General

LANDSCAPE WORKS - INSPECTION REPORT	
Date of visit: ../ ../ .. (minimum one record / day)	
Name of Company/Contractor:	Company/Contractor's telephone no:
Operations carried out	Locations of Operations
Names of operatives on site:	
..... Company observations on damage by others, additional work required or general condition of the works:	
..... This maintenance visit has been satisfactorily completed. SIGNED (for Company) NAME: DATE: ../ ../ .. SIGNED (for client) NAME:..... DATE: ../ ../ ..	

2.2.Appendix 30/02: Weed Control

Action Number	Sub-Clause Reference	Specification Amendment
1	3002.1	<p>Weed control for all injurious weed species and/or other nuisance plant species, including those listed in sub-Clause 3002.1 with the addition of Oil Seed Rape, Rosebay Willowherb, Marestail, Gorse and Broom shall be carried out throughout the New Works until the end of the Establishment Period at sufficient frequency to restrict their growth and prevent their spread.</p> <p>In locations where effective weed control shall be possible and practicable by other means allowed within this Agreement (e.g. hand pulling) there shall be a presumption against the use of chemical herbicides.</p> <p>Chemical weed control should be kept to a minimum and wherever possible avoid the use of Glyphosate based products or other chemicals known to have a negative effect on bees and other pollinating insects.</p> <p>There is no requirement to control areas of Clover.</p>
2	3002.3	<p>Total weed control shall apply to the following locations:</p> <ul style="list-style-type: none"> a) Bases of road restraint systems; b) Around structures, columns, posts and signs; and c) All paved areas, kerbs, hardstanding, filter drains and gravel areas (including but not limited to gravelled central reservations) d) The Contractor shall apply herbicides at sufficient frequency (at least two applications each year) to eliminate weed growth throughout the New Works Period until the end of the Establishment Period.
3	3002.4	<p>Total weed control by non-residual herbicide shall apply to the following locations:</p> <ul style="list-style-type: none"> a) All areas to be seeded and all planting beds prior to seeding or planting so as to be in a weed free condition; b) All stockpiles of topsoil which shall be maintained in a weed free condition; and <p>All planted beds. Discuss omitting to reduce herbicide application</p>
4	3002.5	<p>A translocated herbicide approved by the Scottish Environment Protection Agency or their successors for use in or near water shall be used for weed control in all open ditches, lagoons, watercourses and filter drains. Control shall be at sufficient frequency to eliminate weed growth throughout the New Works until the end of the Establishment Period.</p> <p>Observe all precautions recommended by the manufacturer and remove containers from site immediately they have been emptied or are no longer required, to appropriate hazardous waste disposal site. DO NOT allow any spills or leaks from herbicides.</p>

Action Number	Sub-Clause Reference	Specification Amendment
5	Inserted clause	*Following cutting back of woody growth treat 'regrowth' with translocated herbicide (Glyphosate) and where any large limbs or stumps are exposed these to be drilled and an 'Ecoplug' to be inserted into appropriate stump/stem. Alternatively, any stumps could be ground out using and appropriate mechanised stump grinder to a minimum depth of 150mm. (pre-check for cables).
6	3002.7	<p>Where weed control shall be by spot application, translocated herbicide shall be applied as necessary to control weed species listed in Sub Clause 3002.1, and in any case no less than twice a year during periods of active growth throughout the New Works until the end of the Establishment Period at the following locations:</p> <ul style="list-style-type: none"> a) For control of injurious weeds in all grass areas; b) All planted areas; <p>Spot treatment shall typically be via controlled droplet application of a type appropriate to the herbicide, the species being treated and the location. Any herbicide application is to be approved by the Scottish Environment Protection Agency or their successors for use in or near water shall be used for weed control in all open ditches, SUDs, watercourses and filter drains. Control shall be at sufficient frequency to eliminate weed growth throughout the New Works until the end of the Establishment Period.</p>
7	3002.8	<p>Weed control by hand weeding shall be carried out as necessary, and in any case no less than four times a year throughout the New Works until the end of the Establishment Period at the following locations:</p> <ul style="list-style-type: none"> a) All planting areas where spot application may cause damage, particularly on the roundabouts; b) Within wet meadow grassed areas around SUDs areas; c) Areas densely populated with desirable broadleaf species where spot application may cause damage; d) Within plant protectors and tree/shrub shelters; and e) Where necessary throughout the Site for the elimination of Ragwort and Oil Seed Rape. f) Note: particular care should be taken on roundabouts in bulb planted areas to avoid pulling up / disturbing the bulbs.
8	3002.9	Weed control by cutting shall be carried out as necessary in areas where the extent of growth or type of weed is not effectively controlled by herbicide application or hand weeding.
9	3002.10	The Contractor shall remove all arisings in accordance with sub-clause 3002.10 from weed control operations that involve hand weeding and cutting and take to suitable licensed tip or compositing centre.

LANDSCAPE WORKS - PESTICIDES RECORD		
Date of visit: ../ ../ .. (minimum one record / day)		
Contract Name:		
Name of Company:		Company's telephone no:
Operations carried out	Pesticide used	Locations of Operations
Total weed control		
Weed control in any waterbody		
Selective herbicide to areas of grass		
Herbicide to cultivated plant beds		
Total herbicide around individual plants in grass		
Other (state purpose)		
Names of operatives on site: Qualifications of operatives named:		
Supervisor		
Storeman		
Application by		
Signed (for Company)		
Company's observations on damage by others or any incidents: 		

2.3.Appendix 30/03: Control of Rabbits and Deer

Action Number	Sub-Clause Reference	Specification Amendment
1	3003.1	<p>The Contractor shall carry out rabbit and deer control in all planting and seeding areas as necessary to ensure successful establishment for the duration of the New Works until the end of the Establishment Period. The Contractor will also be responsible for contacting adjacent landowners regarding their obligation to control infestations on their own land. The arisings shall be used to form habitat piles in locations where they are not likely to become visual intrusive or interfere with access or maintenance. No clearance of brambles or herbage shall be undertaken during the bird nesting season.</p> <p>Any existing warrens or rabbit burrows within any planting areas shall be cleared of rabbits and the entry/exit holes effectively blocked prior to any planting taking place on the Site.</p>
2	3003.8	The Contractor is responsible for ensuring that all new plants are protected from damage by rabbits or deer for the duration of the Establishment Maintenance period.
3	3003.9	The Overseeing Organisation shall request an inspection of the site with a representative of the Contractor at monthly intervals to ensure effective control has been achieved.
4	3003.12	The Contractor shall keep planting enclosures free of rabbits, rabbit burrows including exit/entry holes and deer until such time that planting has become fully established and is of sufficient size and maturity so as to be no longer vulnerable to significant damage but no earlier than the end of the Establishment Period.
5	3003.14	<p>The Contractor is responsible for replacing all plants damaged by either rabbits or deer for the duration of the contract. Such replacement plants shall be replaced annually (before December 31 of that planting season) and maintain them for the duration of the Establishment Maintenance period.</p> <p>All replacements (species, size and quantity) to be agreed with the Overseeing Organisation.</p>
6	Inserted Clause	Any deer or rabbits, or other animals, that become trapped within any fenced off areas are to be humanely released with minimal distress.
7	Inserted Clause	<p>Standard and Extra Heavy Standard tree protection e.g. Weld Mesh Tree Shelter Guards</p> <p>Weld mesh tree guards to be used to protect tree planting e.g. Standard and Extra Heavy standard trees to protect from grazing stock e.g. wild deer. Weld mesh tree guards to be manufactured from 12-gauge galvanised wire with 25mm x 75mm grid size. Weld mesh tree guards to be in one piece and semi-rolled. The weld mesh tree guards to be split down their length to allow the guard to be placed around the tree and stake, and then secured with cable ties or staples to main supporting stake. The stakes should be 3 N^o, 75mm in diameter, 1800 long softwood timber stakes, forming an equilateral triangle.</p>

2.4. Appendix 30/04: Ground Preparation

Action Number	Sub-Clause Reference	Specification Amendment
1	3004.1	Within areas of proposed planting or seeding, all existing grass and herbaceous vegetation shall be cut to ground level with the intention to expose as much bare soil as possible.
2	Inserted Clause	<p>Within the areas as indicated on Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001 the area marked for Tree and Scrub Vegetation clearance shall be fully cleared. Where possible all root material of persistent woody plants shall be:</p> <ol style="list-style-type: none"> Cut to ground level between September and March and to treat stumps immediately after cutting with an appropriate selective/translocated herbicide. All arisings from this work shall be removed off site; All regrowth of stumps or emerging new plants shall be treated with an appropriate translocated herbicide as a foliar spray mixed with an adjuvant from May to October or treated with an 'Ecoplug' – drilled and inserted into appropriate stump. Alternatively, any stumps could be ground out using an appropriate mechanised stump grinder to a minimum depth of 150mm. (<i>allowing for pre-check for cables with cable avoidance tool</i>) and then the site to be reinstated with topsoil to a level 50mm above surrounding soil to allow for settlement. <p>The Contractor shall ensure all tree and scrub regrowth is managed to prevent recolonisation of the cleared area. Regular treatments of herbicides between April and September shall occur to the satisfaction of the Overseeing Organisation or at their discretion. Also, option to overseed area with highway grass seed mix to stabilise the ground. This is only to be seen as a temporary solution.</p>
3	Inserted Clause	All vegetation clearance operations shall be undertaken in compliance with the Company's Quality Plan and associated method statements.
4	3004.2	All areas which shall be planted shall be treated with translocated herbicide between 21 and 25 days prior to planting in accordance with sub-clause 3002.4, to the satisfaction of the engineer before establishment works commence. This shall be applied to all areas except for those to be planted in existing woodland, rock cuttings and areas within areas of undisturbed ground.
5	3004.3	Where the area to be treated with herbicide has been cut in accordance with sub-Clause 3004.1 the Contractor shall await active vegetative re-growth sufficient for the herbicide to be at its most effective before applying the herbicide.
6	Inserted clause	<p>All imported topsoil shall be of good quality, with a light texture, and conform to Class 5B of the Highways Specification and BS 3882 'General Purpose Category'. Unless the topsoil is from a reliable source that previously supported good plant growth the following tests are required:</p> <ol style="list-style-type: none"> pH - the soil pH should be between 5.5 – 7.8 Organic matter - which should be greater than 5% Nitrogen (N) - which should be greater 0.2% Phosphorous - which should be greater than 45 mg/kg Potassium - which should be greater than 240 mg/kg

Action Number	Sub-Clause Reference	Specification Amendment
		<p>f) Magnesium - which should be greater than 80 mg/kg</p> <p>More involved tests for phytotoxic elements (e.g. copper, nickel, zinc) and zootoxic elements (e.g. arsenic, lead, mercury) need only be undertaken if there is any doubt regarding the origin of the topsoil. The tests must be undertaken by a recognised testing laboratory and presented to the client prior to importing.</p> <p>Heavy and extra heavy standard trees require a minimum depth of 750mm over a 200mm roughened formation surface soil. This soil depth and volume will not allow very large trees to develop in the way that they would on natural soils and this must be understood and taken into account in design and management.</p>
7	Inserted clause	Compost shall be PAS100 and screened at 20mm and the pH, conductivity and nutrient composition shall be decided in compliance with the Company's Quality Plan and associated method statements based on the results of the manufacturers topsoil tests.
8	3004.7	The requirements of sub-clauses 3004.8 - 3004.11 shall apply to all subsoil to be seeded or topsoil spread under the Agreement except where otherwise stated in Appendix 30/4.
9	3004.10	<p>The Contractor shall undertake final preparation of soils in accordance with Clauses 3004.8 to 3004.11. Areas to receive final preparations of soils shall be as follows:</p> <p>All areas where topsoil is required to be spread under the Contract for all planting and seeding;</p> <p>All other existing soiled areas that are required to be seeded or planted;</p> <p>Any areas that have been damaged by the works; and</p> <p>Any areas that require to be reinstated.</p> <p>There shall be a minimum depth of topsoil of 150mm for all seeded areas and areas of wildflower plug planting, with the exception of Wetland seed mix to SUDs ponds. In these areas, sow seed onto low nutrient substrate or 100mm of economy grade topsoil.</p> <p>Finished settled levels shall be 25-30mm higher than adjoining hard finishes and at the same level as adjoining grass areas.</p>
10	Inserted Clause	<p>All Works in the vicinity of existing trees to be in accordance with BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations.</p> <p>Trees, woodland and hedges to be retained and protected for the duration of the construction period.</p>

2.5.Appendix 30/05: Grass Seeding, Wildflower Seeding and Turfing

Action Number	Sub-Clause Reference	Specification Amendment
1	3005.1	Grass seed shall be sown during the period 1 March to 31 May or 1 September to 31 October, unless otherwise stated in Appendix 30/5.
2	3005.2	All areas to be seeded shall be cultivated as per sub-clause 3005.2 and 3005.3. Final cultivation is to ensure smooth flowing contours with rounding in at top and base of slopes and tie neatly into existing retained levels, with no sudden 'steps' in levels.
3	3005.3	All areas to be seeded with grass, with exception of wetland and pond mix, shall have fertiliser, PAS100 compost or other soil ameliorants, incorporated into the upper 50 millimetre of soil at a rate(s) considered necessary for successful establishment and in accordance with suppliers' recommendations. The rate of application and composition of fertilizer and other ameliorants shall be based upon the topsoil test results. No fertiliser, compost or ameliorants are to be incorporated into areas of topsoil that are to be seeded with wetland and pond around SUDs.
4	3005.4	Grass seed mixes shall be as follows; a) Verges and roundabouts - a grass seed mix that is tolerant of high salt levels due to gritting shall be used for the road verges; b) General areas – a low maintenance seed mix that provides a rapidly establishing sward to provide an appearance and habitat which reflects adjacent and surrounding grassland communities; c) Around SUDs - the proposed mix shall complement the adjacent and surrounding grassland communities of greatest nature conservation value. The wildflower grassland mix is to have a ratio of grass seed to wildflowers of 80%:20% respectively; Do not seed areas that are to be planted with woodland edge / woodland scrub mix.
5	3005.6	Seed shall comprise the mixture(s) stated in Appendix 30/5. a) Grass seed shall comply with BS 4428. b) Grass seed shall be a tested mixture and certificates of germination and purity obtained from an Official Seed Testing Station not more than six months prior to sowing shall be provided to the Overseeing Organisation before sowing, together with the names of the varieties used in the mixture. The information on seed certificates and seed bag labels shall correspond. The Contractor shall provide written evidence that seeds comply with any provenance requirements described in Appendix 30/5.

Action Number	Sub-Clause Reference	Specification Amendment
6	3005.7	<p>Wildflower mixes shall be of UK native origin selected and procured in accordance with Appendix 1 of 'Cost Effective Landscape: Learning from Nature'</p> <p>The Contractor shall complete and submit to the Overseeing Organisation a wildflower seed Provenance Certificate in accordance with the Certification Procedure.</p> <p>Wildflower seed mixes shall contain only species occurring in the National Vegetation Classification category appropriate to the location.</p> <p>Local provenance seed shall be supplied by either harvesting from the approved sites or from nursery propagation to the approval of Scottish Natural Heritage. If nursery propagated seed shall be used the Contractor shall allow sufficient time in their programme to ensure that the seed is available when required for sowing.</p> <p>All wildflower seed shall be tested by an independent organisation such as the Scottish Agricultural Science Agency (SASA) to verify purity of seed (percentage of seed / inert material), species composition, and percentage germination. The test certificates shall be made available to the Overseeing Organisation for consent prior to sowing.</p> <p>The wildflower seed mixes shall contain a minimum percentage of:</p> <ul style="list-style-type: none"> a) 95% pure seed, not inert material (% by weight); and b) a percentage of flora rather than grass seed species which matches the percentage of flora species in the surrounding plant communities of greatest nature conservation value. <p>Seeds within the wildflower seed mixes shall have a minimum germination rate of 80%.</p>
7	3005.8	<p>Unless otherwise stated in Appendix 30/5, sowing shall be carried out by evenly distributing the seed at a rate as specified below:</p> <p>A18 Road Verge and Embankment used as Grass Verge Mix sowing rate 35 g/m²</p> <p>A4 Low Maintenance Areas used as Rough Grassland Mix sowing rate 35 g/m²</p> <p>WFG9 Wetland and Pond Areas Mix sowing rate 5 g/m²</p> <p>Seed mixtures specified are from Germinal. Suitable Alternative mixtures may be used subject to the written approval of test mixtures by the Overseeing Organisation.</p>
8	3005.9	<p>Sowing shall be immediately followed by lightly raking the surface of the soil to cover the seeds, by use of a chain harrow or other suitable plant.</p>

Action Number	Sub-Clause Reference	Specification Amendment
9	3005.11	<p>Grass Seed Mix Germination</p> <p>The seeding shall be repeated as necessary until an evenly distributed dense sward is established over the seeded area. The Contractor shall allow for maintenance of all grass areas in accordance with Clause 3007 until this has been achieved. Establishment shall be regarded as achieved when at least 80% of quadrant sub-divisions are recorded as 'filled' when tested in accordance with Annex A3 of BS 3969.</p>
10	Inserted Clause	<p>Following initial germination, the contractor to revisit site e.g. 2-4 weeks and recheck on grass establishment and germination if any areas larger than 0.25m² are still bare then to over seed with 'fresh' highways grass seed mix and rake this in to the surface topsoil.</p>
11	3005.29	<p>Establishment / initial cuts of the grassed areas are to be in accordance with the requirements below:</p> <p>Verges – initial cut when grass reaches 75mm. Cut to between 25-50mm.</p> <p>General areas – initial cut when grass reaches 75-100mm. Cut down to 25mm after flowering.</p> <p>Wet meadow mix – initial cut if there is sufficient growth above 100mm. Cut after flowering down to 40mm and remove arisings.</p>
12	3005.30	<p>Unless permitted otherwise in Appendix 30/5, all areas shall be left clear of grass cuttings following each mowing by raking or other suitable method, and arisings disposed of off Site.</p>

Proposed Grass Verge Mix

Germinal A18 (Road Verge and Embankment Mix)

Tel: 01522 868714

Email: www.germinal.com

Latin Name	Common Name	% Mix
Festuca rubra rubra	Strong-creeping Red-fescue	40
Poa pratensis	Smooth stalked meadow grass	20
Lolium perenne	Perennial ryegrass	12.5
Festuca Rubra Commutata	Chewings Fescue	10
Lolium perenne	Zurich Perrenial ryegrass	10
Agrostis castellana	Highland browntop bentgrass	5
Trifolium repens	Small clover	2.5

Proposed Grassland Rough Areas

Germinal A4 (Low Maintenance)

Tel: 01522 868714

Email: www.germinal.com

Latin Name	Common Name	% Mix
Festuca rubra	Strong-creeping Red-fescue	65
Festuca ovina	Sheep's Fescue	20
Festuca rubra commutata	Chewing's Fescue	10
Agrostis castellana	Highland Bent	5

Proposed SuDS Mix

Germinal WFG9 (Wetland and Pond Areas)

Tel: 01522 868714

Email: www.germinal.com

Latin Name	Common Name	% Mix
Leontodon autumnalis	Autumn Hawkbit	0.2
Pulicaria dysenterica	Common Fleabane	0.1
Ranunculus repens	Creeping Buttercup	2.5
Cynosurus cristatus	Crested Dogstail	20
Succia pratensis	Devils-bit Scabious	0.1
Lotus uliginosus	Greater Birdsfoot	0.4
Sanguisorba officinalis	Greater Burnet	0.2
Lycopus europaeus	Gypsy Wort	0.2
Juncus inflexus	Hard rush	1.5
Eupatorium cannabinum	Hemp agrimony	0.1
Lythrum salicaria	Loosestife	0.2
Caltha palustris	Marsh Marigold	0.1
Ranunculus acris	Meadow Buttercup	3.8
Filipendula ulmaria	Meadowsweet	0.5
Leucanthemum vulgare	Oxeye Daisy	2.8
Silene flos-cuculi (Lychnis flos-cuculi)	Ragged Robin	0.1
Poa trivialis	Rough Stalked Meadow Gras	10
Sanguisorba minor	Salad Burnet	2.8
Festuca rubra litoralis	Slender Creeping Red Fescue	25
Festuca arundinacea	Tall Fescue	10
Phleum bertolonii	Teno	7.5
Deschampsia caespitosa	Tufted Hair Grass	7.5
Alisma plantago aquatica	Water Plantain	0.2
Iris pseudacorus	Yellow Flag	2.2
Rhinanthus minor	Yellow Rattle	2.0

2.6.Appendix 30/06: Planting

Action Number	Sub-Clause Reference	Specification Amendment
1	3006.1	All Planting Works shall be carried out in accordance with BS 8545, BS 4043, BS 4428 and BS 5837
2	3006.3	Plant stock and sizes shall be as Tables 30/6. 1, 2 and 3. Species, varieties and plant spacing shall be in accordance with the New Works Requirements.

Table 30/06. 1: Specimen Rootballed Trees

Type	Girth at 1 metre Above Ground Level (centimetres)	Clear Stems from Ground Level (metres)	Minimum Height from Ground Level (metres)	Maximum Height from Ground Level (metres)
Semi Mature (<i>Conifers</i>)	20-25	1.5	2.5	3.0
Extra heavy standard	16-18	2	4.25	6.0
Heavy standard	12-14	1.75-2	3.5	4.25

Table 30/06. 2: Transplants and Container Grown

Type	Minimum Age	Minimum Height Above Ground Level	Minimum Container Size
Transplant in tree shelters	1+1 years	600 millimetres	BR
Container grown evergreens (<i>Ilex aquifolium</i>)		400 millimetres	2L

Table 30/06. 3: Cell Grown Stock

Type	Approximate Height (cm)	Minimum Cell Volume (ml)	Minimum Root Collar Diameter (millimetres)
Broadleaves	20-40, 40-60	120	-
At least 25% of plants shall be supplied in the larger size range. Plants in 35ml cells shall not be more than 3 years old. All other plants shall not be more than 2 years old.			

Action Number	Sub-Clause Reference	Specification Amendment
TREES		
3	3006.3	All plants to be supplied shall be as scheduled in Appendix 30/6 and shall comply with: <ul style="list-style-type: none"> a) BS 3936 : Parts 1 to 10 as relevant, b) BS 4043, c) BS 8545, d) The National Plant Specification, published by the Horticultural Trades Association, and/or as otherwise required in Appendix 30/6.
4	3006.4	No grafted stock shall be supplied unless it is stated in Appendix 30/6 that grafted plants are permitted.
5	3006.5	If required in Appendix 30/6, plants shall be supplied in a planting medium containing specified <i>mycorrhiza spp.</i>
6	3006.7	The Contractor shall provide the Overseeing Organisation with written evidence that the supply of bulbs and wildflower plants is from a cultivated source.
7	3006.8	Plants shall be lifted, packed and handled in accordance with BS 3936, BS 4043, BS8545, Horticultural Trades Association National Plant Specification and the Joint Council for Landscape Industries' publication: <i>Handling and Establishing Landscape Plants</i> .
8	3006.9	During the period subsequent to the receipt of the plants and prior to planting, the Contractor shall comply with the treatment of nursery stock specified below: <ul style="list-style-type: none"> a) Rootballed plants. Permeable wrappings shall be kept moist by watering and plants in polythene wrappings protected from direct sunlight. For longer periods of storage, rootballs with permeable wrappings shall be placed on a well drained surface and covered with a deep layer of sand, pulverised bark, wood shavings or other suitable material. b) Protection from frost. When necessary, additional measures shall be undertaken to protect plants from frost. c) The location for temporary storage shall be sheltered from winds and well drained. d) Any plants damaged by frost, desiccation, or in any other way prior to planting, shall be removed from site and replaced by the Contractor with new plants. The new plants shall comply with the quality standards mentioned above.
9	3006.10	All nursery / delivery labels, canes and ties are to be removed at the time of planting and these items disposed of off Site.
10	3006.11	All other arisings from the planting including containers, wrappings, paddings, fastenings and bags shall be collected immediately by the Contractor and removed off site.

11	3006.12	<p>Topsoil for backfilling of tree pits should preferably be site won where it is of suitable quality for successful establishment of the newly planted trees. Improvements to quality of existing soil can be made by the addition of a PAS 100 compost, that is to be well mixed into the topsoil as set out in 3006.13 and 3006.14.</p> <p>Site won topsoil is not to be contaminated with subsoils.</p> <p>Any additional subsoil or topsoil material required to make up site won material is to be suitable manufactured soils. Type and source to be agreed with Overseeing Organisation. Material will require to be tested to ensure it meets minimum nutrient levels and minimal stone content.</p>
12	3006.13	<p>Where trees are to be pit planted compost shall be incorporated into the soil during pit preparation and backfilling at a rate of 4:1 Topsoil to Compost.</p> <p>Incorporate Rootgrow mycorrhizal fungi to all tree pits, at recommended rate(s), before planting.</p> <p>No compost or fertiliser is required for seed areas or woodland edge planting.</p>
13	3006.14	<p>Compost shall be PAS100 and screened at 20mm and pH, conductivity and nutrient composition shall be decided in compliance with the Company's Quality Plan and associated method statements based on the results of topsoil tests.</p>
14	3006.15	<p>Slow release fertiliser shall be incorporated into backfill, into the top 75 millimetres of planting bed soil, in accordance with sub-clause 3006.15 and at a rate based on the results of the soil tests.</p>
15	3006.16	<p>Root dips shall be applied to all bare root plants and anti-desiccant sprays shall be applied to all conifers at the following times:</p> <ol style="list-style-type: none"> a) At the time of lifting from the nursery b) On arrival at site c) Immediately prior to planting
16	3006.17	<p>Planting of rootballed trees shall take place during favourable weather and soil conditions whilst the plants are dormant between the beginning of November and the end of March.</p> <p>The planting season may be extended beyond March, in agreement with the Overseeing Organisation, if weather conditions remain favourable i.e. cool and damp.</p>
17	3006.19	<p>Bulbs shall be planted between 15 September and 30 November, unless otherwise stated in Appendix 30/6.</p>
18	3006.21	<p>No planting or preparatory operations shall take place when the ground is frost bound, covered by snow, excessively wet or waterlogged as defined in Clause 618, or in excessively dry or windy conditions.</p>
19	3006.24	<p>Planting pits for Extra Heavy Standard trees shall be excavated to the dimensions given in Table 30/06.4. Arisings from planting pits and trenches shall be disposed of as directed in Appendix 30/6.</p>

20	Inserted Clause	Current best practice recommends that the tree pit to be square or rectangular in shape. In order to facilitate improved root growth.
21	3006.41	The minimum length of tree stakes for heavy standard and extra heavy standard trees shall be 2m and the minimum width 75mm. Tree stake sizes for other tree forms shall be in accordance with sub-Clauses 3006.36 and 3006.41. Where planting on a slope stakes may be driven at an angle mid way between the slope and the vertical tree stem.
22	3006.42	One tie shall be used for each tree, fixed within 50 mm of the top of the stake and secured to the stake with a 25 mm galvanised clout nail. Ties shall be of a size appropriate to the size of the tree and stake and equipped with spacers of a size that will ensure that the tree and stake remain vertical.
23	3006.43	For extra heavy standards and heavy standards the staking shall be undertaken after the tree has been positioned. Three stakes, each of 3 m length shall be driven down the side of the rootball and into the pit to a depth of 500 mm below the bottom of the pit. The stakes shall be angled outwards to between 5° and 10° at the top and pulled in moderately by tensioning all the supporting bands equally. The stakes shall be equally spaced and shall not pass through the rootball.
24	3006.49	All extra heavy standard, heavy standard and standard trees shall be watered to field capacity immediately following planting. All other tree and shrub plants shall be watered to field capacity immediately after planting if there is a risk to plants of water stress or wilting.
25	3006.51	Trees will be sited in grassed areas. Cutting of grass around trees is to be undertaken by hand with suitable long-handled shears. Strimming is not to take place within 100mm around trees, to avoid damage to trunks.

Table 30/06.4 Dimensions for Planting Pits, Beds and Trenches

Type	Dimensions of excavation W x W x D (mm)	Depth of cultivation at the base of pits or trenches (mm)
Heavy and Extra Heavy Standard trees	1800 x 1800 x 750	200

BULBS		
43	3006.65	Bulbs shall comply with BS 3936: Part 9. All bulbs must be commercially grown, not collected from the wild.
44	3006.66	The number of bulbs per unit area shall be as described in Appendix 30/6 and as indicated on Landscape Drawing Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001 .
45	3006.67	Bulbs shall be planted with the base of the bulb at the depth stated in Appendix 30/6. Bulbs shall have their base in contact with the soil at the base of the hole.
MARGINAL PLANTS		
46	3006.75	Emergent, marginal, and aquatic plants shall be container-grown in pots of minimum 1 litre size, and shall have been rooted and grown within the pot for at least six months.
47	3006.76	All plant material shall be kept fully watered up until time of planting, and the soil or rooting zone prevented from drying out.
48	3006.77	Planting positions above the water level shall be formed by excavating and setting aside sufficient material to allow 75 mm between the root/rhizome ends and the sides of the pit when the roots are fully spread for backfilling. The sides and bottom of the excavated position shall be cultivated to a depth of 100 mm. Excavated material from plant clump positions shall be disposed of in locations stated in Appendix 30/6.
49	3006.78	When the clump has been set in the centre of the position, fine material selected from the excavated material shall be packed and shaken around the roots and thoroughly firmed. Excavated material shall be backfilled in layers not exceeding 150 mm. Following planting, the area of backfilling around each clump shall be left tidy.
MISCELLANEOUS		
50	3006.86	The Contractor shall maintain all planting undertaken under the Contract in accordance with Clauses 3007, 3008 and 3009 until all planting works are certified as completed.
51	3006.87	For the duration of the period stated in Appendix 30/6, the Contractor shall replace all plants which are missing, have died, or which in the opinion of the Overseeing Organisation are failing to make satisfactory extension growth.
52	3006.88	In early September of each year following completion of the initial planting of woody plants, the Contractor shall arrange an inspection of each area of new planting works with a representative of the Overseeing Organisation. Where bulbs, have been planted, the Contractor shall also arrange an inspection of each area of new planting works with a representative of the Overseeing Organisation in the April following completion of the initial planting.
53	3006.89	All plants which are missing, are damaged, have died, or, in the opinion of the Overseeing Organisation, are failing to make satisfactory extension growth, shall be replaced in the next planting season as stated in sub-Clauses 3006.17 to

		3006.20 immediately following the inspection. Replacement plants shall, in all aspects, be the same as the original stock at the time of planting, except that it shall be an additional year older for each year that has elapsed since the original stock was first planted, unless otherwise stated in Appendix 30/6. All replacement planting work shall be carried out in accordance with Clause 3006. The Contractor shall bear the cost of all plant replacements, unless otherwise stated in Appendix 30/6.
54	3006.90	When replacement planting is undertaken, ground and pit preparation and planting shall be undertaken in accordance with this Clause. All plants removed shall be taken to a tip off site. Diseased plants shall be disposed of in accordance with sub-Clause 3010.3.
55	3006.91	Following replacement planting, any stakes, ties, tubes or guards shall be refixed/ replaced and any mulch or mulch mats shall be reinstated to the original specification. Where required in Appendix 30/6, plants shall be watered at the rate stated in Appendix 30/6. Watering shall be carried out prior to any mulch reinstatement.
56	3006.92	The Contractor shall carry out maintenance of new planting in accordance with clauses 3007, and 3009 for the duration of the works until the end of the Establishment Period.
57	3006.93	Water to individual trees with slow release water irrigation bags shall be filled with water every 14 days between 30th April and 31st August in the first growing season after planting.

Table 30/06. 5: Tree Planting to be planted as shown on Landscape Drawing Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001.

Name	Specification
Trees to roundabouts	
Pinus sylvestris	EHS. 3x. 20-25cm girth/. 2.5-3m height. 150cm clear stem. Rootballed. Single straight stem and leader. Well balanced crown.
Betula pendula	EHS. 3x. 16-18cm girth. 4.5-6m height. 200cm clear stem. Rootballed. Single straight stem and leader. Well balanced crown.
Native Trees all other parts of the proposed development	
Crateagus monogyna	HS. 2x. 12-14cm girth. 3.5-4.25m height. 1.75-200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.
Sorbus aucuparia	HS. 2x. 12-14cm girth. 3.5-4.25m height. 1.75-200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.
Sorbus aucuparia	EHS. 2x. 16-18cm girth. 4.5-6.0m height. 200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.

Name	Specification
Betula pendula	HS. 2x. 12-14cm girth. 3.5-4.25m height. 1.75-200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.
Betula pendula	EHS. 2x. 16-18cm girth. 4.5-6.0m height. 200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.
Corylus avellana	EHS. 2x. 16-18cm girth. 4.5-6.0m height. 200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.
Quercus robur	EHS. 2x. 16-18cm girth. 4.5-6.0m height. 200cm clear stem. Single straight stem and leader. Well balanced crown. Rootballed.

Table 30/06. 6: Native Scrub to be planted as shown on Landscape Drawing Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001.

Plant in random groups of 5-11 of the same species.

Name	% Mix	Specification
Rosa Canina	15	Transplant. Cutting. 1+1. 60-80cm height. Bareroot. Branched.
Cornus Sanguinea	20	Transplant. Cutting. 1+1. 60-80cm height. Bareroot. Branched.
Prunus Spinosa	20	Transplant. Cutting. 1+2. 80-100cm height. Bareroot. Branched.
Salix Viminalis	15	Transplant. Cutting. 0/1. 80-100cm height. Bareroot. Branched.
Viburnum Opulus	20	Transplant. Seed raised. 1+2. 60-80cm height. Bareroot. Branched.
Ilex Aquafolium	10	Container Grown. L, bushy

Table 30/06. 7: Marginal planting to be planted as shown on Landscape Drawing Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001.

Plant in random groups of 5-11 of the same species.

Name	% Mix	Specification
Marginal Planting		
Angelica sylvestris	5	1L pot. Plant Sept – April. UK source
Filipendula ulmaria	30	Plug. 2-3 months age. Plant Sept – April. UK source
Geum rivale	10	0.5L pot. Plant Sept – April. UK source
Mentha aquatica	20	0.5L pot. Plant Sept – April. UK source
Ranunculus flammula	25	P9/C0.5g. Plant Sept – April. UK source
Stachys palustris	10	1L pot. Plant Sept – April. UK source

Table 30/06. 8: Bulb planting to be planted as shown on Landscape Drawing Figure 8.10 A90LK-AMY-ENV-SWI-DR-L-0001.

Name	% Mix	Specification
Crocus Tommasinianus	100	7/+ (Topsize). Plant 100cm depth. Plant Sept-Oct

2.7.Appendix 30/07 Grass, Bulbs & Wildflower Maintenance

Action Number	Sub-Clause Reference	Specification Amendment
1	3007.1	The grass and wildflower areas to be maintained are scheduled in Appendix 30/7. Prior to any cutting operation all stones or other harmful material from whatever source which may damage grass cutting plant or create a possible hazard to persons or property shall be removed off Site. All litter from grass cutting areas shall be removed off Site prior to grass cutting. Any movable obstructions such as seats and litterbins shall be removed to facilitate cutting and replaced prior to leaving the Site.
2	3007.3	Grassed areas shall be cut to the following heights: Verges – Cut down to 25-40mm General areas – Cut down to 25mm after flowering. SuDs mix – Cut after flowering down to 40mm and remove arisings.

Action Number	Sub-Clause Reference	Specification Amendment
3	3007.5	The grass cutting operation shall include cutting around all obstacles such as trees, posts and signs. Strimmers may be used where appropriate. Areas around obstacles shall be cut to the same height as specified for the surrounding grassed areas, but no cutting shall be carried out within the distance from individual plants
4	3007.6	Mowing operations shall avoid spillage of debris such as stones onto carriageways or footways. Grass clippings and arisings lying on roads, footpaths, car parks, drains and other hard surfaces shall be immediately swept up and removed off Site. Grass clippings and arisings on all other areas shall be dispersed evenly over the sward, unless specified otherwise in this Clause
5	3007.7	During periods when ground conditions are so wet as to prevent grass cutting without causing damage to the surface or producing divots, operations shall cease and shall recommence only when ground and weather conditions are suitable.
6	3007.8	Bulb foliage in areas where grass is cut shall not be cut down as a separate operation. The first cut of grass areas containing bulbs shall, as far as is possible, be timed to coincide with the commencement of bulb foliage die-back, not earlier than six weeks after flowering and normally early June for Narcissus spp.
7	3007.17	Grass verges cutting requirements shall be as follows or as otherwise stated in Appendix 30/7: <ul style="list-style-type: none"> a) First Cut after Winter/Spring. The areas shall be cut when the grass reaches a height of 100 - 150 mm to a height between 50 - 70 mm and the cuttings removed off Site. b) Subsequent Cuts. The areas shall be cut to a height between 80 - 100 mm at least 3 times per year during the growing season and the cuttings evenly dispersed. c) A 1.2 metre swathe width measured from the back edge of the carriageway or hard strip. The width of cut shall be increased accordingly where the remaining grass between the 1.2 metre area and any adjacent boundary (such as a wall, fence or planting bed) is less than 2 metres; d) Grassed areas within visibility splays; e) Where there are footpaths remote from the carriageway edge where grass between the road and footpath receives a low frequency cut, the outside edge of the footpath shall be subject to the same regime for a width of 1m. f) Additional selective cuts shall be undertaken as necessary to maintain visibility. The areas subject to additional selective cuts shall be extended beyond the minimum area required to maintain visibility in order that they appear naturalistic with smoothly curving edges, avoiding straight lines and abrupt angles.
8	3007.20	Additional selective cuts shall be undertaken if required to maintain visibility of road signs. The areas subject to additional selective cuts shall be extended beyond the minimum area required to maintain visibility in order that they appear naturalistic with smoothly curving edges, avoiding straight lines and abrupt angles.

Action Number	Sub-Clause Reference	Specification Amendment
9	3007.29	Spot herbicide treatment in accordance with sub-Clause 3007.29 shall be carried out at an appropriate frequency in all wildflower areas to eliminate undesirable broadleaf weed species.
10	3007.31	Should molehills require to be dealt with, do not undertake any activity that would destroy mole tunnels or harm the moles themselves.

2.8.Appendix 30/08 Watering

Action Number	Sub-Clause Reference	Specification Amendment
1	3008.5	The Company shall water all planting including grass seeded areas for the Establishment Period at a frequency necessary to ensure establishment and survival.
2	3008.6	Additional watering in accordance with sub-Clause 3008.7 may be required for all planted trees in periods of abnormally dry conditions.
3	Inserted Clause	<p>To ensure successful establishment each planted tree will require watering. A three year watering regime will be instigated. This will be:</p> <ul style="list-style-type: none"> a) Year 1 the irrigation water bag will be filled once per fortnight from the start of May through to the end of September. During extended periods of dry and hot weather this frequency may need to be increased to one times a week. b) Year 2 the tree will receive a minimum of one watering visit per week from the start of May through to the end of September. 25 litres of clean water will be carefully tipped into the inlet of the irrigation pipe per visit, per tree. c) Year 3 for each tree monitor soil moisture on a monthly basis and during periods of extended dry weather and irrigate as required.

2.9.Appendix 30/09 Establishment Maintenance for Planting

Action Number	Sub-Clause Reference	Specification Amendment
1	3009.1	All planting and planting areas shall be maintained for the Establishment Period in accordance with sub-clauses 3009.2 to 3009.25.
2	3009.2	Plants shall be inspected during each visit to undertake maintenance operations and any which may have been subjected to frost heave or wind rock shall be straightened to an upright position and the ground re-firmed.
3	3009.4	Tree stakes, tubes, guards and ties that are no longer required shall be offered to the Overseeing Organisation for re-use. Where the Overseeing Organisation declines the offer the Company shall dispose of them to a licensed disposal facility.
4	3009.9	Plant circles shall be defined as the area within 500 millimetres radius of an individual tree or shrub, within which weed control operations shall be carried out.
5	3009.10	Translocated herbicide shall be applied at a frequency as necessary to keep <u>'plant circles'</u> in all woodland and scrub planting areas weed free, whilst protecting trees and shrubs from the herbicide. Hand weeding shall be undertaken to remove weeds from within tree and shrub shelters and guards.
6	3009.11	Where alternative means of weed control prove ineffective residual herbicide shall be applied at a frequency as necessary to keep plant circles in all woodland and scrub planting areas weed free in accordance with sub-Clause 3009.11.
7	3009.25	All extra heavy standard and heavy standard trees and rootballed conifer trees shall be inspected and maintained annually in accordance with sub clause 3009.25.

2.10. Appendix 30/10 Maintenance of Established Trees and Shrubs

Action No.	Sub-Clause Reference	Specification Amendment
1	3010.1	All established trees and shrubs shall be maintained for the duration of the period of the New Works in accordance with sub-clauses 3010.2 - 3010.71.
2	3010.4	Healthy arisings shall be dealt with in accordance with one or more of items (iv) to (ix) of sub-Clause 3010.4 in compliance with the Company's Quality Plan and associated method statements.
3	3010.45	Tree size categories shall be in compliance with the Company's Quality Plan and associated method statements.
4	3010.56	Crown reduction or reshaping shall be in compliance with the Contractor's Quality Plan and associated method statements.
5	3010.57	Straight felling shall be in compliance with the Contractor's Quality Plan and associated method statements.
6	3010.58	Sectional felling shall be in compliance with the Contractor's Quality Plan and associated method statements.
7	3010.59	Stumps shall be cut as close to the ground as possible or where the tree is growing in a hedge the stump shall be left level with the top of the hedge.
8	3010.60	Stump treatment shall be in compliance with the Company's Quality Plan and associated method statements.
9	3010.62	Stump removal shall be in compliance with the Company's Quality Plan and associated method statements.
10	3010.63	All arisings shall be disposed of off the New Works Site shall be in compliance Company's Quality Plan and associated method statements.
11	3010.68	Undesirable scrub species shall be controlled in accordance with sub-Clause 3010.1 and where identified as being required by the Company's regular inspections.
12	Additional Clause	Undesirable scrub species shall be cut down to 50mm above ground level and plants allowed to re-grow. The Company shall then apply translocated herbicide during the first year of active growth after cutting at a suitable time to maximize the effectiveness of the herbicide.
13	3010.71	Operations in accordance with sub-clause 3010.71 shall be carried out in compliance with sub-Clause 3010.1 and the Company's Quality Plan and associated method statements.

3.References

- BS 3936-1: 1992 - Nursery Stock Specification for Trees and Shrubs, BSI Standards Publications
- BS 4043:1989 Recommendations for Transplanting Root Balled Trees, BSI Standards Publication
- BS 4428: 1989 Code of practice for general landscape operations (excluding hard surfaces), BSI Standards Publications
- BS 5837: 2012 – Trees in relation to design, demolition and construction – Recommendations, BSI Standards Publication
- BS 8545: 2014 - Trees: from nursery to independence in the landscape – Recommendations, BSI Standards Publication
- Joint Council of Landscape Industries specification
- Manual of Contract Documentation for Highways Works, Volume 1 Specification for Highways Works, Series 3000 Landscape and Ecology
- Horticultural Trades Association National Plant Specification

