
SERIES 3000 (05/01)
LANDSCAPE AND ECOLOGY

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LANDSCAPE AND ECOLOGY

3001 General

(05/06) Quality Management Schemes

1 (05/06) Organizations providing landscape and ecology works for highway schemes shall comply with this Series and the associated quality management schemes detailed in Appendix A.

Notice and Liaison

2 (05/06) If required in Appendix 30/1, the Contractor shall give at least 48 hours' notice to the Overseeing Organisation of the intention to commence any of the following operations, or other operations stated in Appendix 30/1:

- (i) Subsoil treatment.
- (ii) Topsoil cultivations.
- (iii) Grass or wildflower seeding or turfing.
- (iv) Planting.
- (v) Mulching.
- (vi) Tree felling.
- (vii) Arboricultural works.
- (viii) Application of pesticides.
- (ix) Works outside the road boundary.
- (x) Any works within, adjacent to, or which may affect any site of nature conservation or archaeological interest stated in Appendix 30/1.

This notice shall be repeated subsequent to periods when the operations have been temporarily suspended. If required in Appendix 30/1, the Contractor shall liaise directly with other landowners to give notice and arrange precise access dates for works outside the road boundary.

Peat

3 (05/06) Peat or peat-based products shall not be used, except:

- (i) where peat is excavated on Site; or
- (ii) where peat is required in Appendix 30/1; or
- (iii) in Wales, where reduced peat products are acceptable provided proof that the peat is extracted from areas of little conservation value, as defined in the Report of the

Working Group on Peat Extraction and Related Matters, published by DETR. The Contractor shall provide such proof to the Overseeing Organisation of Wales in the manner stated in Appendix 30/1.

Pesticide Application

4 (05/06) A 'pesticide' shall be any agent exerting biological control over living organisms and as such, shall include herbicides, pesticides, lumbricides, fungicides, algaecides, moss killers and all such similar products or materials.

5 (05/06) All pesticides, methods of application, materials and tank mixes, methods of working, transportation, storage and records shall be strictly in accordance with current legislation and codes of practice. The Contractor shall make available to the Overseeing Organisation evidence of competency in the use of pesticides.

6 (05/06) The pesticides shall be fit for the purpose for which they are intended. Only pesticides intended for horticultural applications (not agricultural applications) shall be used. All pesticides shall be used in strict accordance with the manufacturer's instructions.

7 (05/06) The method of application and the undertaking of the work shall not lead to the pollution of any watercourse or water supply. The Contractor shall comply with current advice pertaining to the Overseeing Organisations of England, Scotland, Wales or Northern Ireland, as appropriate, for pesticides application near watercourses. Such advice is given as follows:

In England and Wales, the Contractor shall comply with current Department for Environment, Food and Rural Affairs (DEFRA) and Environment Agency guidelines for pesticides application near watercourses. Before each pesticide application near a watercourse, the Contractor shall notify the Environment Agency and obtain any necessary consent forms. The Contractor shall be responsible for the return of completed consent forms to the Environment Agency.

In Scotland, the Contractor shall comply with current Environment and Rural Affairs Department, Scottish Executive and Scottish Environment Protection Agency guidelines for pesticides application near watercourses. Before each pesticide application near a watercourse, the Contractor shall notify the Scottish Environment Protection Agency and obtain any necessary consent

forms. The Contractor shall be responsible for the return of completed consent forms to the Scottish Environment Protection Agency.

In Northern Ireland, the Contractor shall comply with current Department of Agriculture and Rural Development, and Environment and Heritage Service guidelines for pesticides application near watercourses. Before each pesticide application near a watercourse, the Contractor shall notify the Environment and Heritage Service and obtain any necessary consent forms. The Contractor shall be responsible for the return of completed consent forms to the Environment and Heritage Service.

8 (05/06) All pesticides shall be securely and safely stored and transported. All used or partly used containers shall be removed from Site immediately after use. Application equipment and containers shall not be rinsed out on Site under any circumstances.

9 (05/06) The Contractor shall ensure that all machinery and equipment used in the application of all pesticides is properly cleaned, maintained, serviced and repaired in accordance with the manufacturer's instructions to ensure correct application and to prevent malfunction and leakage at all times.

10 (05/06) Water used for dilution of pesticides shall be from a clean supply.

11 (05/06) The pesticide is to be applied during the season and weather conditions favourable to the effective control of the targeted species. The method of application shall minimise spray drift. No pesticide shall be applied when wind speeds are high enough to cause spray drift. The Contractor shall postpone, cancel or suspend the application of pesticides at any time when it is considered that conditions have become unsuitable.

12 (05/06) Prior to commencement the Contractor shall publicise, in accordance with current regulations, that pesticides applications are to be undertaken.

13 (05/06) A record of all pesticide use shall be maintained by the Contractor on a form as detailed in Appendix 30/1. It shall contain such information as the pesticide, name of operative, location of Site and weather conditions. A copy of the record form shall be submitted to the Overseeing Organisation at intervals to be stated in Appendix 30/1.

Bird Nesting Season

14 (05/06) For the purposes of this Specification, the bird nesting season shall be the period stated in Appendix 30/1.

Inspection Reports

15 (05/06) If required in Appendix 30/1, the Contractor shall provide Inspection Reports for the activities carried out under Clauses 3007, 3009 and 3010. The reports shall identify the level of work activities undertaken for each operation on a form as detailed in Appendix 30/1.

3002 Weed Control

General

1 Weed control shall be required in the locations and at the frequencies given in Appendix 30/2, for infestations of injurious weeds as follows:

- (i) Broad leafed dock.
- (ii) Curled dock.
- (iii) Common ragwort.
- (iv) Creeping thistle.
- (v) Spear thistle.
- (vi) Himalayan Balsam.
- (vii) Giant hogweed.
- (viii) Japanese knotweed.

Other species which may be a nuisance locally that require control in accordance with this sub-Clause shall be stated in Appendix 30/2.

2 Weed killing shall achieve total die-back of weeds and in the case of total weed control shall not allow any significant re-growth (less than 5%) within 6 months of application. In the case of selective weed control there shall be not more than 5% re-growth during the season.

Total Weed Control

3 On hardstandings, gravelled or paved areas and around street furniture, contact, translocated and residual herbicides approved for total weed control shall be applied in accordance with the manufacturer's instructions, at the locations and frequency stated in Appendix 30/2.

4 For site preparation, on topsoil heaps and in planted beds, a translocated, non-residual herbicide approved for total weed control shall be applied in accordance with the manufacturer's instructions, at the locations and frequency stated in Appendix 30/2.

5 In open ditches, lagoons, watercourses and filter drains a contact or translocated herbicide approved for use in or near water shall be applied in accordance with the manufacturer's instructions, at the locations and frequency stated in Appendix 30/2.

Selective Weed Control in Grass

6 At the locations and frequency stated in Appendix 30/2, weeds in verges, central reserves, planted areas and other grassed areas shall be controlled using a selective translocated herbicide. The herbicide shall be applied during a period of active growth in accordance with the manufacturer's instructions.

Weed Control by Spot Application of Herbicide

7 Where described in Appendix 30/2, weed control shall be carried out to control the target species listed, using spot treatment with a translocated herbicide, ie applied with a device that ensures that the herbicide touches weed species only. The herbicide shall be applied in accordance with Clause 3001, at the season and frequency stated in Appendix 30/2.

Weed Control by Pulling/Handweeding

8 Handweeding shall be carried out at the locations and frequency stated in Appendix 30/2. Handweeding shall consist of the removal of the entire weed, including roots, by digging, forking, hoeing or pulling. Weeds shall be removed prior to flowering and the arisings removed in accordance with sub-Clause 10 of this Clause.

Weed Control by Cutting

9 Weeds shall be cut at the locations and frequency stated in Appendix 30/2. The weeds shall be cut prior to flowering to a height of between 50 and 75 mm or as otherwise stated in Appendix 30/2.

Arisings from Weed Control Operations

10 Where described in Appendix 30/2, all arisings from weed control operations shall be removed from Site. Injurious weed arisings shall be destroyed.

3003 Control of Rabbits and Deer

General

1 In the locations and for the period of time stated in Appendix 30/3, or when instructed by the Overseeing Organisation, the Contractor shall carry out rabbit control. Prior to instructing rabbit control, the Overseeing Organisation will have contacted adjacent landowners regarding their obligation to control infestations on their own land. Thereafter the Contractor shall liaise as necessary with adjacent landowners for access, to control co-ordination and report any further complaints to the Overseeing Organisation.

2 The Contractor shall comply with current legislation in relation to pest control and make available to the Overseeing Organisation evidence of suitable formal training of operatives as competent for the procedures and pesticides to be employed.

3 A register shall be maintained by the Contractor detailing persons employed, pesticides used, weather, site observations made (e.g. badger setts, vehicle damage or vandalism), together with confirmation that the areas are satisfactorily controlled.

Control Operations

4 Badger setts and fox earths shall be clearly identified and marked in an inconspicuous manner, using a method to be agreed with the Overseeing Organisation. The location shall be recorded and reported to the Overseeing Organisation. Sett and earth markers shall be removed immediately after rabbit control operations have been completed. As required under the Wildlife and Countryside Act (1981) and the Protection of Badgers Act (1992)/in Northern Ireland the Wildlife (Northern Ireland) Order 1985, the Contractor shall not divulge the location of badger setts to any other party or parties.

5 After treatment, the ground shall be left clear, with rabbit holes filled in. Where stated in Appendix 30/3, any bramble and herbage that will interfere with the control of rabbits shall be cut and the arisings dealt with in accordance with sub-Clauses 3010.3 and 3010.4.

Rabbit Control within the Road Boundary

6 Initial clearance and thereafter effective control of rabbit infestations shall be undertaken within the road boundary.

7 Effective control is defined as:

- (i) No damage to verges, embankments/cuttings, site furniture or drains.
- (ii) No fresh signs of bark stripping on woody plants.
- (iii) Few fresh droppings seen.
- (iv) No new appreciable grazing seen.
- (v) No complaints from adjoining landowners.

8 The area where control is required shall be visited a sufficient number of times during the first month, to keep the rabbits controlled, and substantially eliminated. Thereafter the Contractor shall ensure effective control for the period stated in Appendix 30/3 or instructed by the Overseeing Organisation.

9 If required in Appendix 30/3, the Overseeing Organisation will inspect the Site together with a representative of the Contractor at monthly intervals to agree whether effective control has been achieved.

Clearance of Rabbits and Deer in Fenced Areas to be Planted

10 Any rabbit burrows located within fenced enclosures for planting shall be cleared of all rabbits and all exit/entry holes effectively blocked immediately after completing the fencing of each enclosure, in accordance with the requirements described in Series 300.

11 Unless otherwise instructed by the Overseeing Organisation, the Contractor shall not plant any area until all rabbits and deer have been cleared from the fenced enclosure.

12 The Contractor shall maintain the enclosure free of rabbits, rabbit burrows including exit/entry holes and deer for the period stated in Appendix 30/3 or instructed by the Overseeing Organisation.

Replacement of Plants Damaged by Animals

13 The Contractor shall replace any plant material damaged by rabbits or deer due to the failure of the Contractor to effectively block entry points, burrows and nests or failure of the Contractor to maintain the fences, shelters or guards as described in the Contract.

14 The Contractor shall replace the damaged plants in accordance with Clause 3006 and maintain them in accordance with Clause 3008 and Clause 3009 for the period stated in Appendix 30/3 or instructed by the Overseeing Organisation.

3004 Ground Preparation

Vegetation Clearance

1 Where stated in Appendix 30/4, all grass and other herbaceous vegetation shall be cut in accordance with sub-Clause 3002.9 to a height of between 50 mm and 75 mm and the arisings removed off Site.

2 Where stated in Appendix 30/4, the Contractor shall apply a non-residual translocated herbicide in accordance with sub-Clause 3002.4 to all areas to be planted between 21 and 25 days prior to planting.

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.

4 The treatment for total herbicide control shall kill all treated growth including their root systems. The Contractor shall not commence any excavation or cultivation of the areas where herbicide has been applied until the vegetation has been effectively controlled.

Subsoil Treatment

5 Where stated in Appendix 30/4 planting areas shall be ripped, using a ripping tine or subsoil plough. The minimum depth of treatment shall be 450 mm unless otherwise stated in Appendix 30/4.

6 The spacing between the tine furrows shall be as stated in Appendix 30/4. If no dimension is stated, the spacing shall be close enough to cause the uplifting and fracturing of the soil throughout the profile to the minimum treated depth and shall be determined by the soil type and conditions and the type of subsoiler used. Approximate spacings shall be as follows:

- (i) conventional subsoiler alone - 600 mm;
- (ii) winged subsoiler alone - 750 mm;
- (iii) winged subsoiler with leading tines - 1.0 m.

Final Preparation of Soils

7 Where stated in Appendix 30/4, the requirements of sub-Clauses 3004.8 to 3004.11 shall apply to subsoil to be seeded or topsoil spread under the Contract.

8 Any consolidated material is to be broken up to 300 mm depth and the top 50 mm of all soil reduced to a tilth suitable for final shaping with a grading blade (particle size 10 mm and below). All undesirable material brought to the surface including stones larger than 50 mm in any dimension, roots, tufts of grass and foreign matter is to be removed off Site, unless otherwise stated in Appendix 30/4.

9 When material is reasonably dry and workable it shall be graded in accordance with the Drawings.

10 Finished levels of material after settlement shall be:

- (i) as shown on the Drawings adjoining pavings, kerbs or grass areas;
- (ii) not less than 150 mm below damp proof course of adjoining buildings;
- (iii) at the same level as adjoining soil areas.

11 Once material has been spread and/or graded, the area shall not be traversed by machinery or used for storage purposes.

Soil Contaminated During the Contract

12 Where the Contractor has contaminated the ground with cement slurry, oil, tar or any material harmful to plant life, soil shall be excavated to a depth of 1.0 m and removed off Site. Uncontaminated subsoil and topsoil shall be used for backfilling, to the finished profiles required under the Contract.

3005 Grass Seeding, Wildflower Seeding and Turfing

Season

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. Wildflower seed shall be sown during the period stated in Appendix 30/5.

Final Cultivations

2 Where stated in Appendix 30/5, immediately prior to sowing or hydraulic seeding or laying turf the upper 50 mm of soil shall be reduced to a fine tilth by use of a chain harrow or other suitable plant.

3 If required in Appendix 30/5, fertiliser or other soil ameliorants shall be evenly incorporated into the upper 50 mm of soil during final cultivations at the rate stated in Appendix 30/5.

Seed

4 Seed shall comprise the mixture(s) stated in Appendix 30/5.

5 Grass seed shall comply with BS 4428.

6 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.

7 The Contractor shall provide written evidence that seeds comply with any provenance requirements described in Appendix 30/5.

Conventional Sowing

8 Unless otherwise stated in Appendix 30/5, sowing shall be carried out by evenly distributing the seed at a rate of not less than 20 g/m² for side slopes of embankments and cuttings and not less than 15 g/m² elsewhere.

9 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.

Hydraulic Seeding

10 Hydraulic seeding shall be applied in the locations stated in Appendix 30/5. The hydraulic seeding mixture, any special process requirements and the rate of application shall be as described in Appendix 30/5. The

mixture shall be kept constantly stirred during application to maintain a homogenous slurry.

Grass Seed Germination

11 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.

Turf

12 Turfing shall be carried out in accordance with BS 3969 and BS 4428.

13 When it is stated in Appendix 30/5 that turf arising on Site shall be used, such turf shall be stripped as follows or as otherwise described in Appendix 30/5:

- (i) Grass shall be mown before lifting to no more than 35 mm high.
- (ii) Turves shall be cut using plant or tools designed for the purpose.
- (iii) Turves shall not be cut from soil that is frozen, waterlogged, as defined in Clause 618, or excessively dry.
- (iv) Turves shall be of uniform thickness, in accordance with BS 3969.
- (v) Turves shall be rectangular, with the shorter sides not less than 300 mm.

14 Where stated in Appendix 30/5, imported turf shall be used. All imported turf shall comply with BS 3969 and BS 4428. Imported turf shall contain the grass and/or herb mixture stated in Appendix 30/5.

15 The source of turf shall be notified in writing to the Overseeing Organisation and a sample of not less than 6 no. 300 mm x 300 mm turves provided for approval in accordance with Clause 106, not less than one week prior to commencing turfing.

16 Imported turf shall be delivered to the Site within 24 hours of lifting. Care shall be taken in transport to avoid deterioration due to inadequate covering or overheating.

17 Turf shall be laid within 18 hours of delivery between 1 April and 30 September and within 24 hours of delivery between 1 October and 31 March. If this is not possible, turf shall be temporarily laid flat on topsoil and kept moist.

18 Turves shall not be stored in stacks over 1.4 m in height.

19 Turf shall be laid on soil that is moist but not frozen or waterlogged, as defined in Clause 618. Turf shall not be laid during periods of drought or onto soil that is excessively dry, or during heavy rainfall.

20 Turf shall be placed working from planks laid on previously laid turves.

21 Turf shall be laid to a bond with broken joints, butted up with joints no wider than 10 mm. When laid on slopes, the bond shall be laid diagonally across the slope.

22 Levels shall be adjusted by raking out or infilling with fine soil under the turves. When laid, turf shall be lightly tamped in place with clean wooden beaters. The use of rollers shall not be permitted.

23 After laying turf the surface shall be dressed with finely sifted topsoil/sand which shall be brushed in to completely fill all joints.

24 Whole turves shall be used at edges and trimmed to a clean line. Turf shall be neatly cut away to a diameter of 800 mm around individual trees.

25 If required in Appendix 30/5, turf shall be secured in position using either:

- (i) Softwood pegs, 200 mm long x 25 mm square; or
- (ii) Galvanised wire pins, 200 mm long x 4 mm diameter, bent or hairpin pattern.

26 Where stated in Appendix 30/5, immediately after laying, turfed areas shall be watered at a rate of 15 l/m².

27 Newly sown or turfed grass shall be watered as necessary to ensure establishment. When grassed areas require irrigation, water shall be applied at the rate of 15 l/m² using low pressure hose sprinkler or spray evenly over the entire area.

Establishment Cuts

28 Any opening of joints or uneven levels in turf areas caused by shrinkage of turves or settlement shall be made good by top-dressing with 50% sieved topsoil/50% fine sand mix.

29 For the number of cuts stated in Appendix 30/5, newly-established grass, whether newly-sown or turfed, shall be mown to leave a nominal 50 mm height. The first mowing shall be carried out once the grass has reached a height of 100 mm, the second and any subsequent establishment cuts when it has re-grown to 100 mm. The plant used for mowing shall comply with any requirements of Appendix 30/5. Any turves disturbed by mowing shall be re-firmed into their original position and watered to their full depth.

30 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.

3006 Planting

1 All Planting Works shall be carried out in accordance with BS 4043, BS 4428 and BS 5837.

2 On completion of planting operations, all disturbed accesses to, and ground around the planted areas shall be completely reinstated to their former condition as at the commencement of planting.

Plants

3 All plants to be supplied shall be as scheduled in Appendix 30/6 and shall comply with BS 3936 : Parts 1 to 10 as relevant, BS 4043, the National Plant Specification, published by the Horticultural Trades Association, and/or as otherwise required in Appendix 30/6. If plants grown in cells are required, the cells shall be designed for tree or shrub use and the plants shall be grown in open conditions for one growing season.

4 No grafted stock shall be supplied unless it is stated in Appendix 30/6 that grafted plants are permitted.

5 If required in Appendix 30/6, plants shall be supplied in a planting medium containing specified mycorrhiza.

6 Where the seed origin of native plant species is required to be of specific provenance, the provenance shall be determined and described in accordance with Forestry Commission Practice Note 8: Using Local Stock for Planting Native Trees and Shrubs. Written evidence of its provenance shall be provided to the Overseeing Organisation prior to planting, using the Provenance Certificate pro-forma in Appendix 30/6. Plant material shall comply with any other special provenance requirements stated in Appendix 30/6.

7 The Contractor shall provide the Overseeing Organisation with written evidence that the supply of bulbs and wildflower plants is from a cultivated source. The Contractor shall inform the Overseeing Organisation in writing of the proposed source of supply of all plant materials at least 14 days prior to delivery so as to enable the plants to be inspected at the nursery before delivery to Site. If required in Appendix 30/6, the Contractor shall make arrangements for the Overseeing Organisation to select individual trees of Standard size and larger, at the nursery.

8 (05/08) Plants shall be lifted, packed and handled in accordance with BS 3936, BS 4043 and the Horticultural Trades Association publication, the National Plant Specification, Section 10.2, Handling and Establishing Landscape Plants.

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:

- (i) Bare-root plants. Prior to despatch or on arrival at Site plants may be stored up to 3 days in bundles with a covering of freely-draining moisture-retentive material such as wet sacking or straw which is moistened periodically. For a storage period of more than three days, bundles shall be opened and the plants spread out and heeled into trenches in topsoil, minimum depth 300 mm, with the roots fully in contact with the soil.
- (ii) Bare-root plants transported in plastic bags. Plants in bags shall be stored no more than one layer deep and be protected from direct sunlight at all times. Where delay of more than one day occurs, the bags shall be stored upright, not stacked, in a cool shady position or shed, or placed in a cold store. If cold store facilities are not available, plants shall be removed from bags and heeled into soil with all roots covered.
- (iii) Container or cell grown plants. Containers shall be maintained upright, watered as required, sheltered and protected from frost, and shall not be packaged or stored more than one layer deep. Degradable pots, cells or root-trainers that may disintegrate in transit shall be enclosed in polythene film (250 gauge) and firmly secured.
- (iv) Rootballed plants. Permeable wrappings shall be kept moist by watering and plants in polythene wrappings protected from direct sunlight. For longer periods of storage, root-balls 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.
- (v) Protection from frost. When necessary, additional measures shall be undertaken to protect plants from frost.
- (vi) The location for temporary storage shall be sheltered from winds and well drained.
- (vii) All containers shall remain completely filled with compost. If up to 10% compost has been lost from containers at any stage, then further suitable moistened compost shall be

added to completely cover the root systems and fill the containers. Any containers which have lost more than 10% compost shall be replaced. All containerised plants shall be thoroughly soaked prior to planting and all containers removed.

- (viii) Any plants damaged by frost, desiccation, or in any other way prior to planting, shall be removed from site and replaced with new plants.

10 Unless otherwise stated in Appendix 30/6, all labels, canes and ties shall be retained on the plant for 12 months unless they prove restrictive to growth.

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.

Topsoil, Compost, Fertiliser and Anti-dessicants

12 Unless otherwise stated in Appendix 30/6, topsoil for tree pits shall be General Purpose Grade conforming to BS 3882.

13 Where stated in Appendix 30/6, compost or fertiliser shall be deposited over planting areas, for incorporation into the soil during ground cultivation, or incorporated into soil during pit preparation and backfilling.

14 Compost shall be peat-free organic composted material graded less than 25 mm particle size and free from any non biodegradable material, weed material or plant pathogens. It shall have an organic matter content greater than 35% on a dry matter basis and readily available trace elements. The pH, conductivity and nutrient composition shall be as required in Appendix 30/6. The compost shall be supplied with a volume tolerance of less than 5%.

15 Where specified in Appendix 30/6, slow-release fertiliser shall be used. The fertiliser shall be thoroughly and evenly mixed with the pit backfill or into the top 75 mm of planting bed soil, or scattered over an area 600 mm in diameter around the planting position, at the rates specified in Appendix 30/6.

16 Where stated in Appendix 30/6, anti-transpiration sprays, root dips, anti-desiccant soil additives or other forms of anti-desiccant shall be used. Where such anti-desiccant measures are specified these shall be applied in strict accordance with the manufacturer's instructions.

Time of Planting

17 Planting of bare-rooted, rootballed or cell-grown trees, shrubs, non-aquatic perennials and wildflowers

shall take place during favourable weather and soil conditions, during the season stated in Appendix 30/6. Bare rooted or root balled conifers or evergreens shall be planted during November or March.

18 Container-grown plants of the types listed above may be planted at any time during favourable weather and soil conditions.

19 Bulbs shall be planted between 15 September and 30 November, unless otherwise stated in Appendix 30/6.

20 The planting season for reeds and other marginal/aquatic plants shall be March to April.

21 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.

Planting Depth

22 Cell-grown plants shall be planted with the top of the root plug covered by 10-20 mm of planting medium. Planting depth for all other plants shall be to the original nursery soil mark on the plant, unless otherwise stated in Appendix 30/6.

Notch Planting of Trees, Shrubs and Hedges

23 Where pits, beds or trenches are not used, plants shall be notch-planted upright by one of the following methods, as directed in Appendix 30/6:

- (i) into a T-shaped opening of sufficient size for the roots of bare-root plants to be fully spread out or to accommodate a cell-grown plant without breaking the root-plug; or
- (ii) into a T-shaped opening (size as directed in (i) above) through upturned turf, which has been dug from the planting location. For individual plants, turfs shall be cut 300 mm square and 200 mm deep, for single row hedges, a strip of turf shall be cut 300 mm wide and for double-row hedges, a strip of turf shall be cut 600 mm wide. All existing vegetation on turf to be inverted shall be cut to a height of not more than 50 mm, before the turf is cut; or
- (iii) cell-grown plants may be planted using a proprietary tool for the purpose; or
- (iv) as directed in Appendix 30/6.

Surrounding soil shall be firmed back after planting.

Planting Pits, Beds and Trenches

24 Planting pits for Feathered trees, Light standard trees and all larger trees shall be excavated to the

dimensions given in Table 30/1. The subsoil in the pit base shall be broken up to a further depth as given in Table 30/1. If required in Appendix 30/6, pits shall be excavated for whips, transplants and shrubs and trenches excavated for hedges, to the dimensions given in Table 30/1. The subsoil in the pit base shall be broken up to a further depth as given in Table 30/1. Arisings from planting pits and trenches shall be disposed of as directed in Appendix 30/6.

TABLE 30/1: (05/08) Planting Pits, Beds and Trenches

Type	Dimension of excavation W x W x D mm	Depth of cultivation at the base of pits or trenches mm
Semi-mature trees	Measurement of rootball plus 400 in each direction	200
Extra heavy standard and Heavy standard trees	1800 x 1800 x 750	200
Selected standard trees Tall standard trees Standard trees	1000 x 1000 x 600	200
Light standard trees Half standard trees Feathered trees	700 x 700 x 600	200
Whips) where pit- Transplants) planting is Shrubs) specified	300 x 300 x 300	150
Hedging (where specified)	* x 600 x 300	150
Cell-grown plants	150 mm greater than W and D of root-plug	

* length of hedging

25 On sloping ground, pits shall be dug with vertical sides and horizontal base and shall maintain the specified minimum depth throughout. When backfilled, planting pits shall be finished to existing contours.

26 For pits for Standard trees and larger trees, any excavated topsoil shall be set aside to be used as backfill. The Contractor shall import topsoil in accordance with sub-Clause 3006.12, to make up for any deficiencies caused by the removal of subsoil or fill material.

27 (05/08) Unless otherwise stated in Appendix 30/6, or where the soil is naturally free draining, prior to backfilling 1800 mm x 1800 mm x 750 mm pits, a 200 mm thick layer of river-washed gravel or crushed stone, 0-25 mm, shall be laid in the base to facilitate drainage.

Planting in Cultivated Beds and Hedges

28 Where required in Appendix 30/6, hedge-trenches excavated in accordance with Table 30/1 shall be backfilled with topsoil or with a pre-mixed 80% topsoil / 20% compost mixture or other mixture, as stated in Appendix 30/6.

29 Where required in Appendix 30/6, the ground shall be cultivated to a minimum depth of 300 mm removing all live injurious weed roots and growth to a tip off Site. Any stones or other rubbish over 75 mm in any direction shall be removed from the surface and disposed of in accordance with sub-Clause 3004.8. Root disturbance of adjacent plants shall be avoided and the surface left with a medium tilth. Any ameliorants specified in Appendix 30/6 shall be incorporated in a second pass following initial cultivation.

30 If required in Appendix 30/6, a 600 mm wide strip along hedgelines shall be cultivated in accordance with sub-Clause 3006.29.

31 In planting beds, the extent of the area to be planted shall first be defined by plants spaced around the perimeter. The remaining plants shall then be used to fill in the centre of the area in an informal manner, avoiding straight lines and regular geometric patterns.

32 At each planting position sufficient soil shall be excavated from the bed to allow 75 mm clearance between either the rootball, or the root-ends when fully spread, and the sides and bottom of the planting hole. The plant shall be set in the centre of the plant position, showing its best side to the front.

33 Finely broken back-fill material shall be packed around the roots. The plants shall be gently shaken to allow fine soil to surround the roots. As soil is returned it shall be lightly consolidated and firmly heeled around the root-collar. Immediately after planting the soil surface shall be evenly graded. Where required in Appendix 30/6, the soil shall then be watered at the rate stated in Appendix 30/6.

Planting of Whips, Transplants and Shrubs into Pits or Trenches

34 Each plant shall be placed upright in the centre of the pit or, where required in Appendix 30/6, the hedge trench, with the roots spread evenly outwards and downwards without restriction. Where necessary, any badly damaged roots shall be carefully pruned before being planted.

35 The pit or trench shall be backfilled with a pre-mixed 80% topsoil / 20% compost mixture or other mixture stated in Appendix 30/6 and the backfill lightly firmed.

Stakes and Ties

36 Unless otherwise stated in Appendix 30/6, stakes shall be round timber, peeled of bark, straight in length and free of snags, pests and diseases. Stakes shall have a top diameter of 50-75 mm.

37 Unless otherwise stated in Appendix 30/6, adjustable tree ties, strapping or spacers shall be made of black PVC or reinforced rubber. The width of the belt shall be 25 mm.

Planting of Trees

38 Where required in Appendix 30/6, root barriers shall be provided at the time of planting, in order to constrain the growth of tree roots. Root barriers shall be supplied and installed in accordance with Appendix 30/6 and the manufacturer's instructions.

39 All wrappings, insulation and padding shall be removed from rootballs immediately before backfilling. No wire or plastic mesh containers may be left in position. Any damaged or torn roots shall be cut back cleanly to sound wood prior to planting.

40 Stakes for all standards and feathered trees shall be firmly driven and positioned into the tree planting pit before planting to a minimum depth of 300 mm below the bottom of the pit. The stake shall be positioned off centre on the prevailing windward side of the tree as near to the tree as possible but shall not interfere with the free movement of the branches and shall cause no rubbing.

41 Unless otherwise stated in Appendix 30/6, the Contractor shall use the shortest possible stake to support the tree; when the stake has been driven into the ground there shall be not more than one third of the height of the clear stem of the tree above ground.

42 Unless otherwise stated in Appendix 30/6, for all standards and feathered trees, 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.

43 For extra heavy standards and heavy standards the staking shall be undertaken after the tree has been positioned. Unless otherwise stated in Appendix 30/6, 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.

44 Unless otherwise stated in Appendix 30/6, for extra heavy standards and heavy standards with above ground staking the tree shall be secured centrally between the stakes with two sets of supporting bands of fire hose or equivalent webbing of minimum width 70 mm. The upper set shall be positioned as near to the tops of the stakes as possible and the lower set shall be positioned 500 mm above ground level. Each band shall take the form of a loop around the tree stem nailed to the stake and shall be equally tensioned so as to hold the tree centrally between the stakes.

45 Where stated in Appendix 30/6, semi-mature trees shall be planted as shown on HCD Drawing Number K5. Three proprietary anchors per pit shall be provided at angles of 120° around the pit ensuring that they are securely locked in position with their cable eyes 50 mm above the layer of coarse gravel and 150 mm from the side of the rootball position. The rootball surface shall be protected with a triangular timber frame formed from three pieces of 700 mm x 100 mm x 50 mm timber securely fastened by nails at each corner. Galvanised cable shall be threaded using a ratchet tensioner. Wires shall not cut across the rootball.

46 Unless otherwise stated in Appendix 30/6, backfill to tree pits shall comprise any excavated topsoil and imported topsoil as necessary with compost in accordance with sub-Clause 3006.14, in a 80% topsoil/20% compost mixture thoroughly mixed.

47 For bare root trees, each tree shall be planted upright in the centre of the hole and the root system fully spread outwards and downwards in the pit, at the correct level so that the stake passes through the root system as closely to the trunk as possible, with minimal disturbance to the roots themselves. Once the tree has been correctly positioned the pit shall be backfilled with the pre-mixed soil/compost mixture.

48 During backfilling, the tree shall be gently shaken at regular intervals to settle the mixture closely around the roots. The backfill mixture shall be firmed in layers not exceeding 150 mm to a finished level equivalent to the nursery soil mark on the tree.

49 Where required in Appendix 30/6, each tree shall be watered in on the same day as planting, at the rate stated in Appendix 30/6. The water shall be delivered by means of a low pressure hose to avoid any washing out of the soil, into a depression made in the planting medium around the base of the stem to ensure that the water goes to the root system. The planting medium shall then be returned to its previous level.

50 Where stated in Appendix 30/6, a 75 mm or 80 mm diameter perforated flexible plastic irrigation pipe shall be inserted around the rootball during planting, at a depth of 150 mm below the ground surface. The pipe

shall be of sufficient length to coil completely around the root system or rootball and shall be provided with two 'T'-piece connections with aeration caps, which shall be located opposite each other.

51 Where trees are to be situated within mown grass areas two additional posts of a diameter similar to that of the stake shall be driven firmly into the ground to leave a finished height of approximately 400 mm above soil level. These posts shall be sited clear of the tree roots in a triangular relationship to the stake, such that the combined effect with the weed-free circle will prevent accidental damage by mowing machinery.

Tubes, Guards and Ties

52 In the locations stated in Appendix 30/6, individual plant protectors as described in Appendix 30/6 shall be provided. Plant protectors shall be green, brown or black and if formed of solid sheet material this shall be translucent. The top edge of plant protectors shall be formed to prevent abrasion damage to the enclosed plants. Plant protectors shall be fixed with releasable ratchet ties to softwood or hardwood stakes, 25 mm x 25 mm in cross section. The length of the stakes and the number of stakes and releasable ratchet ties to be used shall be as stated in Appendix 30/6. Where two stakes are used they shall be placed opposite each other within the plant protector.

Mulches: Ground Preparation

53 Before application of any mulch the planting areas and/or tree positions which are to be mulched shall be free of grass and weed growth. Where required in Appendix 30/6, the planting areas and/or tree positions shall be watered at the rate stated in Appendix 30/6.

Organic Mulches

54 Where it is stated in Appendix 30/6 that compost shall be applied as a surface mulch it shall comply with sub-Clause 3006.14 or other composition as specified in Appendix 30/6.

55 (05/08) Where it is stated in Appendix 30/6 that timber mulch is to be used, it should be a product certified under the Forest Stewardship Council (FSC), as an appropriate grade for the site. Two types may be used:

- (i) Chipped conifer bark, size range 25-75 mm, maximum 15% fines, composted for a minimum of six weeks prior to delivery; or
- (ii) An organic mulch comprising composted wood chips or bark, free of fungi and diseases, methyl bromide contamination or foreign material. It shall be matured for a minimum of 16 weeks, naturally heated by the process of decomposition to temperatures

exceeding 50°C for a minimum period of 14 days, followed by a period of stabilisation.

56 Where organic mulch is to be used as a mulch, it shall be spread evenly over the planting bed, or over a 1 m diameter circle around trees, to a depth of 75 mm after settlement.

57 Organic mulch shall be hollowed out where necessary to ensure low branches and foliage are not covered. The mulch surface shall be left even, tidy, and sloping down at bed edges.

Individual Mulch Mats

58 Where it is stated in Appendix 30/6, that mulch mats are to be used they may be square or round. Unless otherwise specified in Appendix 30/6, mulch mats shall be not less than 800 mm x 800 mm (or 800 mm diameter) or greater than 1000 mm x 1000 mm (or 1000 mm diameter). Mulch mats shall be manufactured from the material specified in Appendix 30/6.

59 The mulch mat shall be placed over or split and placed around the plant stem and shall be spread out over the ground, ensuring that the plant is in the centre of the mat.

60 Edges of mulch mats shall be secured as directed in Appendix 30/6 by either:

- (i) 200 mm x 3 mm diameter wire pegs or proprietary plastic pegs manufactured for this purpose, driven through the mat to their full depth at the corners of square mats or at six equally spaced points around circular mats, plus a peg to secure the overlapped slit. Pegs shall not be used to secure polythene or bituminous felt mats; or
- (ii) burying a strip 100 mm wide around the edges of the mat vertically into the ground. All cut edges of woven polypropylene mulch mats shall be so buried to prevent fraying; or
- (iii) placing pieces of turf at least 150 x 150 mm in size or other materials of equal weight on at least eight positions around the mat; or
- (iv) as specified in Appendix 30/6.

Sheet Mulch

61 Where it is stated in Appendix 30/6 that sheet mulch shall be used it shall be black, olive green or brown in colour. Unless otherwise specified in Appendix 30/6, sheet mulch shall be manufactured from at least 500 gauge tear resistant polythene, or from woven or spun-bonded polypropylene weighing 100 to 110 g/m² and shall contain an ultra-violet inhibitor.

62 As directed in Appendix 30/6, where sheet mulch is used for hedges it shall be laid either in:

- (i) 3 strips of sheet mulch shall be laid along 2-row hedges, one between each planted row and one on each side, to cover an area extending 300 mm beyond both sides of the line(s) of hedge plants; or
- (ii) one strip of sheet mulch shall be laid, to extend at least 300 mm beyond both sides of the line(s) of hedge plants and an 'L' shaped slit measuring 150 mm x 150 mm shall be made to accommodate the planting of hedging plants.

63 Sheet mulch strips shall be overlapped at joins. Strips used for hedges or over planting beds shall be secured by one of the following methods, as directed in Appendix 30/6:

- (i) 200 mm x 3 mm diameter wire pegs or proprietary plastic pegs manufactured for this purpose, driven through the mat to their full depth at 300 mm intervals along all edges and overlapping joins. Pegs shall not be used to secure polythene or bituminous felt mulches; or
- (ii) burying a strip 100 mm wide along the edges of the mat vertically into the ground. All cut edges of woven polypropylene sheet mulch shall be so buried to prevent fraying; or
- (iii) placing pieces of turf minimum 150 mm x 150 mm in size, laid at 500 mm intervals along the outer edges and laid at 500 mm intervals along overlapping joins.

Sheet Mulch Collars

64 If required in Appendix 30/6, where mulch mats or sheet mulch is used, collars shall be fitted around the stem or trunk of each plant to secure the planting slit and shall be securely stapled in place.

Planting of Bulbs

65 Bulbs shall comply with BS 3936 : Part 9. All bulbs must be commercially grown, not collected from the wild.

66 The number of bulbs per unit area shall be as described in Appendix 30/6. Bulbs shall be thrown onto the ground to ensure natural spacing and planted where they fall.

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. Where bulbs are to be planted in formal grass areas a

plug of turf shall be neatly removed to form the planting hole and replaced after planting.

Wildflower Plant Preparation and Planting

68 Where it is stated in Appendix 30/6 that areas are to be planted with wildflowers the Contractor shall prepare the ground by one of the following methods, or otherwise, as stated in Appendix 30/6:

- (i) create an area free of all live plant growth not less than 300 mm and not more than 450 mm in diameter at each plant station using a translocated herbicide to sub-Clause 3002.4. Where spacing is very close, plant stations shall be merged; or
- (ii) cultivate an area at each plant station to the following dimensions:
diameter = width of plant rootball x 1.5
depth = depth of plant rootball x 1.5.

69 Wildflower plants shall be distributed in natural, informal groups or as shown on the Drawings. Where required in Appendix 30/6, the planting positions or areas shall be marked out prior to planting for approval by the Overseeing Organisation. The density of plants/m² shall be as stated in Appendix 30/6.

70 A hole shall be formed in the cultivated plant station of a sufficient depth and width to allow roots to be spread without cutting or bending. Friable topsoil shall be replaced over the roots to bring the surface level with that of adjacent areas. Plants shall only be removed from their protective covering or packing immediately before planting and the roots shall not be allowed to dry.

71 Where stated in Appendix 30/6, wildflowers shall be planted through mulch mats. No more than five plants per m² of mat shall be planted. The Contractor shall lay the mat above the planting station after the cultivation is complete and cut the mat so that the hole created will be no greater than 1.25 times the surface area of the plug. The sides of the mat must be buried sufficiently and securely to prevent rodents or other such vermin entering beneath the mat. The planting station shall be sufficiently concave to encourage positive run-in of rainwater.

72 Each plant shall be watered in its container not less than 2 hours or more than 24 hours before planting. 0.5 litres of water shall be applied to each plant immediately after planting unless heavy rain is falling at the time.

Planting of Reeds, Rushes, Marginal, Emergent and Aquatic Plants

73 Where it is stated in Appendix 30/6, Reeds, Rushes, Marginal, Emergent or Aquatic Plants shall be planted in or adjacent to ponds, rivers, ditches, lakes, and other areas of impeded drainage.

74 Reeds and rushes shall be clumps of minimum size 300 x 300 x 300 mm, excluding top growth, excavated from an approved source of established material, and free of pests, diseases, weed species or pollutant chemicals or metals.

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. Aquatic plants may be supplied in plastic or wire basket pots.

76 All plant material shall be kept fully watered up until time of planting, and the soil or rooting zone prevented from drying out.

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.

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.

79 For planting positions below the water level, clumps of plant material shall be pushed into the ground to sufficient depth to cover roots/rhizomes. Plants shall be firmed by treading. Aquatic plants shall be securely pegged or wired down into the bed.

Marker Posts for Planted Areas

80 Where stated in Appendix 30/6, the Contractor shall insert marker posts to mark out the boundary of each planting or wildflower seeding area which is not otherwise protected by fencing or other structures.

81 Marker posts shall be of timber complying with Clause 304 and shall be at least 1000 mm long and have a diameter of 50-75 mm. The top 300 mm of each marker post shall be painted with a white waterproof paint. Where unpeeled stakes are used the top 300 mm shall be peeled before painting.

82 Marker posts shall be driven at least 500 mm into the ground leaving 500 mm above ground.

83 Posts shall be spaced at not more than 20 m apart around the perimeter of the planted area and shall be located at all corners of over 15°.

84 Where a cable or underground service is adjacent to or within a planted area, then any posts shall not be closer than 1.5 m to the cable and painted red.

85 The pegs shall be maintained in good condition.

Replacement of Failed or Defective Plants

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.

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.

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, perennials, wildflowers or aquatic plants 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.

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.

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.

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.

Post-planting Maintenance

92 For the duration of the period stated in Appendix 30/6, which shall run concurrently with the period stated under sub-Clause 3006.87, the Contractor shall carry out maintenance of new planting in accordance with Clauses 3007 and 3009 as appropriate.

3007 Grass, Bulbs and Wildflower Maintenance

General Grass Maintenance

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 Tractors mounted with grass cutting equipment shall comply with manufacturer's recommendations regarding the fitting and operation of attachments. Grass cutting equipment fitted to tractors shall comply with manufacturer's recommendations regarding the fitting and operation of such attachments. All dedicated grass-cutting machines shall have an effective silencer of the type originally fitted on manufacture. All grass cutting equipment, whether self-propelled or attached to a tractor, shall comply with the following:

- (i) All cutters and blades shall be sharpened and set according to the manufacturer's recommendations to ensure a consistent cleanly mown sward and the height of cut determined as the height above ground level to the cutting blade measured with the machine standing on a hard level surface.
- (ii) All guards shall be in place and in good condition and all safety devices shall be operational and of a type originally fitted on manufacture.
- (iii) For grass and vegetation cutting on slopes, the grass-cutting equipment manufacturer's recommendations relating to safe gradients for cutting shall be observed.

3 Grass shall be cut cleanly and evenly, at the frequencies and to the heights specified in this Clause, without damage to the existing surface. Soft vegetative growth such as clover and other broad-leaved vegetation shall be deemed to be part of the cutting operation where it falls within areas of grass.

4 Mowing shall take place over the whole grass area up to its boundaries which may be fencing, paving or similar, leaving no areas uncut and producing an even sward height across the whole area.

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 given in Appendix 30/7.

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 or in Appendix 30/7.

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.

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.

Grass Cutting: High frequency

9 In the locations stated in Appendix 30/7, cutting requirements for close mown grass shall be as follows, or as otherwise stated in Appendix 30/7:

- (i) First cut after Winter/Spring. The areas shall be cut when the grass reaches a height of 50 - 75 mm to a height between 25 - 40 mm and the cuttings removed off Site.
- (ii) Subsequent cuts. The areas shall be cut to a height between 25 - 30 mm, at least 12 times per year during the growing season.

10 The edges of planted areas adjoining kerbs, hard surfaces and structures shall be cut with edging shears or a mechanical equivalent, at least 4 times per year during the growing season. Clean straight or curved

lines as determined by the original shape of the grass area, or the adjacent structure or hard surface shall be produced. Herbicide treatment in lieu of edging will not be permitted.

11 The edges of planted areas adjoining kerbs, hard surfaces and structures shall be re-formed at least twice per year to produce clean straight or curved lines as determined by the original shape and dimension of the grass area. Where edges abut planted areas, re-forming shall include drawing back the soil from the edges so that edging shears can be used.

12 Where edges abut hard surfaces, re-forming shall include the removal of any soil or vegetation growing on or through the hard surface.

Grass Cutting: Medium frequency

13 In the locations stated in Appendix 30/7, cutting requirements for parkway and other grass areas shall be as follows, or as otherwise stated in Appendix 30/7:

- (i) First Cut after Winter/Spring. The areas shall be cut when the grass reaches a height of 75 - 150 mm to a height between 50 - 70 mm and the cuttings removed off Site.
- (ii) Subsequent Cuts. The areas shall be cut to a height between 50 - 60 mm at least 6 times per year during the growing season and the cuttings evenly dispersed.

14 The edges to ornamental planting areas adjoining kerbs, hard surfaces and structures shall be trimmed with edging shears or mechanical equivalent at least twice per year during the growing season. Clean straight or curved lines shall be produced as determined by the original shape of the grass area. Herbicide treatment in lieu of edging will not be permitted.

15 The edges of ornamental planting areas adjoining kerbs, hard surfaces and structures shall be re-formed with a half moon edging iron or a mechanical equivalent once per year to produce clean straight or curved lines as determined by the original shape of the grass area.

16 Where edges abut hard surfaces, re-forming shall include the removal of any soil or vegetation growing on or through the hard surface.

Grass Cutting: Low frequency

17 In the locations stated in Appendix 30/7, cutting requirements for amenity and other grass areas shall be as follows, or as otherwise stated in Appendix 30/7:

- (i) 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.

- (ii) 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.

Grass Cutting: Minimal frequency

18 In the locations stated in Appendix 30/7, a single cut shall be undertaken once per year on swathe cuts, visibility areas and other areas as required in Appendix 30/7. The cut shall be to a height not exceeding 100 mm and the cuttings evenly dispersed to leave a neat and uniform appearance. The timing of the cutting shall be as stated in Appendix 30/7. Where the areas contain injurious weeds as listed in sub-Clause 3002.1, the first cut shall be undertaken prior to the weeds flowering. Additional selective cuts shall be undertaken within these areas as required in Appendix 30/7 or instructed by the Overseeing Organisation.

19 A single cut of 1 m width from the edge of the carriageway shall be undertaken once per year. Additional selective full width cuts shall be undertaken within sight lines at hazardous bends, junctions, roundabouts, some central reservations, major accesses, bus stops and laybys and any other areas as required in Appendix 30/7 or instructed by the Overseeing Organisation.

20 A single cut shall be undertaken once per year in the visibility splay in front of road signs. The cut shall extend from the edge of the carriageway, at a point 50 m from the sign and be splayed to meet the full width of the sign. Additional selective cuts shall be undertaken within these areas as required in Appendix 30/7 or instructed by the Overseeing Organisation.

21 All vehicles involved in verge and visibility area cutting shall comply with the requirements of Clause 117.

Grass Cutting: Banks and Ditches

22 In the locations stated in Appendix 30/7, banks and ditches shall be cut to a height of between 60 and 80 mm, at a frequency of once per year or as otherwise stated in Appendix 30/7. The arisings shall either be dispersed evenly over the sward avoiding blockage of drains and ditches, or removed off Site, as required in Appendix 30/7.

Grass Cutting: Areas of Planting

23 In the locations stated in Appendix 30/7, grass and herbaceous groundcover in uncultivated planted areas/ plantations shall be cut to a height of between 60 and 75 mm after the seeding of desirable wildflower species, every alternate year or at a frequency stated in Appendix 30/7. Unless otherwise stated in Appendix 30/7, the cutting shall include bramble and

tree and shrub seedlings with stems of less than 20 mm diameter, but exclude trees and shrubs of less than 200 mm diameter which form part of the plantation.

24 Unless otherwise stated in Appendix 30/7, arisings shall be raked off and removed off Site, by such means that avoids pulling, tearing or causing other damage to the soil surface and retained vegetation.

25 Where it is stated in Appendix 30/7 that grass and herbaceous plants shall be cut in planted areas/ plantations, the Contractor shall cut between the woody plants over the whole area up to the boundaries of the planted area/plantation, whilst avoiding damage to the trees and shrubs, leaving no areas uncut and producing an even sward height across the whole area.

Wildflower Areas and Areas of Nature Conservation Value

26 Where cutting of wildflower areas or areas of nature conservation value is required, one or more of the following operations, or any other operations, shall be carried out, as directed in Appendix 30/7:

- (i) Annual Spring/Summer Cut
Areas shall be cut to a height of between 50 and 60 mm after the seeding of desirable species, in late spring/early summer or as directed in Appendix 30/7. Arisings shall be raked off and removed off Site, avoiding any pulling, tearing or causing other damage to the soil surface and retained vegetation.
- (ii) Annual Summer/Autumn Cut
Areas shall be cut to a height of between 50 and 60 mm after the seeding of desirable species, in late summer/early autumn or as directed in Appendix 30/7. Arisings shall be raked off and removed off Site, by such means that avoids pulling, tearing or causing other damage to the soil surface and retained vegetation.
- (iii) Topping Cut
Areas shall be cut to a height of between 90 and 100 mm after the seeding of desirable species, in late autumn or as directed in Appendix 30/7, with the cuttings being finely chopped and evenly dispersed over the area.
- (iv) Biennial Cut
Areas shall be cut to a height of between 50 and 60 mm, after the seeding of desirable species, every alternate year. Arisings shall be raked off and removed off Site.

27 Within the wildflower areas or areas of nature conservation value stated in Appendix 30/7, the cutting shall include areas of bramble, tree and shrub saplings of less than 20 mm diameter. Cutting shall be timed to allow for prior seeding of desirable species listed in Appendix 30/7.

28 Where directed in Appendix 30/7, to improve the potential for wildflower colonisation in wildflower areas or areas of conservation value identified by the Overseeing Organisation, the ground shall be scarified by mechanical means to a depth of 25 mm so that the thatch is broken up, creating a proportion of exposed soil of 15-20%. Arisings shall be removed off Site. The method employed shall avoid the uprooting of desirable vegetation such as fine grasses. A sample area treatment shall be carried out to the Overseeing Organisation's approval prior to the remainder being scarified.

29 Where directed in Appendix 30/7, weed control in wildflower areas shall be carried out using spot treatment with a translocated herbicide applied in accordance with sub-Clause 3002.7, at the frequency stated in Appendix 30/7. Herbicide shall be applied to undesirable broadleaved species such as the thistles listed in Clause 3002, nettle and bramble unless they are stated in Appendix 30/7 to be of nature conservation value.

30 Where directed in Appendix 30/7, any weed growth that cannot effectively be controlled by chemical means without risk of damage to wildflowers shall be hand-weeded in accordance with sub-Clause 3002.8, at the frequency stated in Appendix 30/7.

Molehills

31 If required in Appendix 30/7, molehills in grass areas shall be removed before grass-cutting and the soil distributed widely over surrounding grass or on nearby cultivated areas.

Bulbs and Perennials

32 Where required in Appendix 30/7, bulb foliage within ornamental planting areas shall be cut down when leaves have died back naturally: not earlier than six weeks after flowering and normally early June for Narcissus spp. Bluebell stands shall not be cut. Arisings shall be raked up and removed off Site.

3008 Watering

General

1 The Contractor shall ensure that there is no delay in the execution of watering by obtaining all necessary licences and permissions from water companies for the

efficient execution of watering on any particular Site including stand pipes, pressure reducing valves, hoses, bowsers, pumps, sprinklers and ascertaining the availability of second class water from sewage works or other approved sources in the event of a Hose Pipe Ban.

2 Watering of grass, shrubs, hedges and trees shall be temporarily suspended in areas where ponding occurs or where there is a risk of surface run-off. Once any surface water has soaked away, repeated applications shall be applied until the watering operation has been completed.

3 Water to individual trees shall be applied either by low pressure hose or through irrigation hoses to the base of the plants ensuring thorough soaking of the ground occupied by the root system of the plant. Where necessary a depression shall be formed around the stem base of the plant to ensure that water reaches the root zone and does not run off at the surface onto the surrounding ground.

4 Any damage caused as a result of watering operations shall be reinstated including the replacement of any soil lost from pits or beds due to washing off. Following watering, bed and pit surfaces shall be left even and all plants firm and root systems not exposed. Particular care shall be taken not to damage plants when handling hoses in planted areas.

Establishment Watering

5 The Contractor shall water all planting undertaken under the Contract, in accordance with this Clause, at the frequency necessary to ensure establishment and survival, until all planting works are completed.

6 For the establishment period stated in Appendix 30/8, the Contractor shall water all planting undertaken under the Contract, in accordance with this Clause, at the frequency necessary to ensure establishment and survival.

Additional Watering

7 Where required in Appendix 30/8, additional watering shall be instructed by the Overseeing Organisation in the locations stated in Appendix 30/8, during periods of abnormally dry weather. When instructed, water shall be applied at the following rates or as stated in Appendix 30/8:

- (i) Grassed areas: water shall be applied at the rate of 15 l/m² using low pressure hose sprinkler or spray evenly over the entire area.
- (ii) Shrubs, hedges and ornamental beds: water shall be applied at the rate of 25 l/m² to shrub beds and 25 litres per linear metre to

hedgerows by low pressure hose sprinkler or spray evenly over the entire area. Careful forking of sealed or compacted surfaces shall be carried out to facilitate percolation.

- (iii) Trees: the minimum quantity of water specified in Appendix 30/8 shall be applied by low pressure hose to each tree. Before the first application of water and after any break of more than five weeks, the ground surface around the tree for a radius of 500 mm shall be loosened with a fork to aid penetration into the soil. The water shall be applied at a steady rate to avoid run-off to and erosion of the surrounding area.

3009 Establishment Maintenance for Planting

1 Plants and planting areas shall be maintained in accordance with this Clause in the locations and over the time periods stated in Appendix 30/9.

Firming

2 Plants shall be inspected during each visit to undertake maintenance operations and any which have been subject to frost heave or wind rock shall be straightened to an upright position and the ground re-firmed.

Stakes, Tubes, Guards and their Ties

3 Stakes, tubes, guards and their ties shall be inspected twice per year in October and March, and adjusted to allow for the growth of each plant. Any damaged items shall be removed off Site and replaced with new items in accordance with Clause 3006.

4 Stakes, tubes, guards and ties shall be removed from plants where they are no longer required and either disposed of off Site or returned to the Overseeing Organisation for re-use, as required in Appendix 30/9.

Pruning

5 (05/08) All pruning shall be undertaken in accordance with the requirements of Clause 3010, using secateurs and handsaws. Stems shall only be removed so as to retain the natural appearance of the individual plant species in accordance with the guidance in BS 7370 Part 4. Arisings from pruning shall be disposed of in accordance with Clause 3010.

6 (05/08) All broken and badly damaged branches from the plants shall be pruned by cutting back to within 10 mm of the parent branch or trunk or to a suitable bud/node. The cut shall be angled correctly in accordance with BS 7370 Part 4.

7 At the edges of planted areas, branches and stems shall be cut back to a minimum of 300 mm behind the kerblines, fence, wall or other edge demarcation.

Organic Mulch

8 Any mulch which has fallen onto adjoining hard surfaces and grassed areas shall be swept up and if not contaminated by weeds or rubbish returned to the planted area and spread to original depth. Any mulch which has been contaminated by weeds or rubbish shall be removed off Site.

Weed Control: Young Trees and Shrubs in Grass Plots

9 Plant circles shall be defined as the area within a 500 mm radius of an individual tree or shrub, within which weed control operations are carried out.

10 At the locations and frequency stated in Appendix 30/9, where mulch mats are not used, translocated herbicides shall be applied to the plant circles around individual trees and shrubs in accordance with Clause 3001 and sub-Clause 3002.2, using a shield to protect the plants from the herbicide. The operation shall include the clearance of vegetation by hand from within shelters and guards.

11 At the locations and frequency stated in Appendix 30/9, where mulch mats are not used, a residual herbicide shall be applied to the plant circles around individual trees and shrubs in accordance with Clause 3001 and sub-Clause 3002.2, whilst protecting the trees and shrubs from the herbicide. Prior to application, the ground surface shall either be free of grass or weeds, or any grass present shall be no more than 50 mm height.

12 Where directed in Appendix 30/9, the depth of mulch in individual plant circles and overall plant areas shall be inspected once per year in March and if less than an even depth of 75 mm, new mulch to sub-Clause 3006.55 shall be laid to restore the depth to 75 mm.

13 Where directed in Appendix 30/9, mulch mats shall be inspected three times per year. Any mats and pegs which are not secure shall be re-fixed. Damaged items shall be replaced with mulch mats to match the originals, in accordance with sub-Clauses 3006.59, 60 and 61.

14 Five years after planting, any non-biodegradable mulch mats and any pegs shall be removed off Site and the soil surface made good.

Weed Control: Young Trees and Shrubs in Cultivated Beds

15 Ornamental planted areas shall be cleared of all litter and debris prior to weed control operations and the arisings removed off Site.

16 Where required in Appendix 30/9, planting areas shall be visited monthly to carry out specified weed control operations. Any grass and weed growth within the planted beds shall be removed by hand or chemical means as stated in Appendix 30/9. Herbicides shall be used in accordance with Clause 3001. The roots and foliage of weeds and grass shall be removed off Site once die back is complete.

17 The use of herbicide will not be permitted in planting beds containing perennial plants even when the leaves of these plants have died down and they are dormant.

18 Where organic mulch has been applied, the depth shall be maintained at an even depth of 75 mm by the addition of fresh mulch in accordance with sub-Clause 3006.55 at least once a year.

19 Where required in Appendix 30/9, in ornamental planted beds in urban areas where the bed is not mulched, the soil surface shall be cultivated in May and July or at the frequency stated in Appendix 30/9, using a hoe or light rake to create a fine-to-medium tilth, evenly graded, without damage to plants or roots.

Weed Control: Hedges

20 Where required in Appendix 30/9, the hedge base and an area of 300 mm width on either side of the hedge plants shall be kept free of weeds by herbicide treatment or handweeding. Herbicides shall be applied in accordance with Clause 3001.

21 Where organic mulch was applied after planting, the Contractor shall inspect the depth of mulch once per year in March. If the mulch is less than an even depth of 75 mm, new mulch to sub-Clause 3006.55 shall be laid to restore the depth to 75 mm.

22 Where sheet mulch has been laid, it shall be inspected three times per year. Any sheet mulch or pegs which are not secure shall be re-fixed. Damaged items shall be replaced with materials to match the original, in accordance with sub-Clauses 3006.59, 60 and 61.

23 Five years after planting, any non-biodegradable sheet mulch and any pegs shall be removed off Site and the soil surface made good.

Individual Trees in Urban Streets

24 Individual trees shall be defined as feathered, standard and extra heavy standard trees planted as

single specimens rather than as part of a planted group. Street trees in pavements, tree grilles and those planted as specimens within a plot are defined as individual trees, as well as any other existing young or semi-mature trees identified in Appendix 30/9 or by the Overseeing Organisation.

25 The individual trees in the locations stated in Appendix 30/9 shall be inspected annually during the growing season and maintained as follows:

- (i) Irrigation systems shall be maintained in working order. Any irrigation pipes shall be checked and repaired if necessary.
- (ii) All weeds around the base of the tree shall be removed, to a radius of 500 mm in grass or to a whole tree station if in the pavement or a tree grille. Removal shall be by hand and/or chemical means as directed in Appendix 30/9. When using herbicide the requirements of Clause 3001 and sub-Clause 3002.2 shall apply.
- (iii) Where organic mulch has been applied to a weed-free circle it shall be topped up to a depth of 75 mm with bark mulch to sub-Clause 3006.55.
- (iv) Tree supports, stakes, ties and anchoring systems shall be inspected and adjusted.
- (v) Rabbit guards, tree guards and grilles shall be inspected and adjusted.
- (vi) The levels of aggregate, mulch and soil beneath grilles shall be made up to the same level as the surrounding surface.
- (vii) When trees can stand unsupported, stakes and/or ties shall be removed, back-filling stake holes with topsoil and compacting topsoil.
- (viii) Formative pruning shall be carried out in accordance with Clause 3010, including removal of epicormic shoots and the removal of deadwood. Competing secondary leader shoots, and closely spaced, duplicated branches with potentially weak or tight forks shall be removed.
- (ix) The Contractor shall report to the Overseeing Organisation any defects requiring further action.

3010 Maintenance of Established Trees and Shrubs

1 Plants shall be maintained in accordance with this Clause in the locations and over the time periods stated in Appendix 30/10.

Weed Control: Trees and Shrubs in Cultivated Beds

2 Cultivated beds shall receive weed control treatment four times per year during the growing season or at the frequency stated in Appendix 30/10. Any grass and weed growth within the bed shall be removed by hand or chemical means, as required in Appendix 30/10. Herbicides shall be used in accordance with Clause 3001 and Clause 3002. The roots and foliage of weeds and grass shall be removed off Site when die back is complete.

Arisings from Pruning, Cutting or Felling of Woody Plants

3 (11/04) Any infected (diseased or pest) prunings or timber arisings shall be removed off Site immediately after cutting and burned or buried at a depth of no less than 2.0 m in a location to be approved in writing by the Overseeing Organisation, except diseased arisings affected by diseases described in Arboriculture Research Notes or Arboriculture Research and Information Notes issued by the Arboricultural Advisory and Information Service, which shall be dealt with in accordance with the advice published in these Notes.

In the event of a plant disease epidemic, diseased arising shall be disposed of in accordance with the current recommendations of the Department for Environment, Food and Rural Affairs (DEFRA), or the Forestry Commission, or, in Scotland, the Environment and Rural Affairs Department, Scottish Executive or Forestry Commission, or in Wales, the Welsh Assembly Government or Forestry Commission, or in Northern Ireland, the Department of Agriculture and Rural Development - Forest Service.

4 Healthy arisings shall be dealt with in one or more of the following ways, as required in Appendix 30/10:

- (i) Removed off Site without chipping first.
- (ii) Chipping. All arisings shall be processed immediately using a woodchipper. All remaining arisings from thinning/coppicing that cannot be chipped shall be removed off Site.
- (iii) All arisings from chipping shall be removed off Site.

- (iv) Where chippings are to be retained on the Site, the chipper shall produce chippings in the size range 0-75 mm.
- (v) Where chippings are to be spread back onto the Site within areas of existing vegetation, without intending to suppress or kill the existing ground vegetation, the chippings shall be returned to within the boundary of the areas stated in Appendix 30/10 and spread to an even consolidated depth of 25 mm maximum.
- (vi) Where chippings are intended to act as a weed-suppressant mulch, they shall be spread over the pruned or coppiced plantations stated in Appendix 30/10 to a depth of 75 mm.
- (vii) Chippings which are excess to the requirements specified in Appendix 30/10 shall be removed off Site.
- (viii) Arisings of greater than 150 mm diameter shall be securely placed on Site in the locations stated in Appendix 30/10 for nature conservation purposes.
- (ix) Where directed in Appendix 30/10, the arisings from thinning and coppicing shall be windrowed on the centre of embankments or cuttings within the boundary of the area in which the work has taken place. Material shall not be dragged from one area to another. With cross-cutting and cut branches only the timber shall be windrowed. All side branches from the cut timber shall be removed and the timber reduced to 1 m lengths. Windrows shall be formed in one of the following patterns, as required in Appendix 30/10, keeping the arisings at least 500 mm away from the retained trees and shrubs:
 - (a) For younger plantations windrows shall be 7 m apart and a minimum of 3 m from the edges of the plantation. The windrows shall be secure, with the material tightly packed and stacked to a height and width of between 0.5 and 1 m.
 - (b) For older plantations, windrows shall be 7 m apart and a minimum of 10 m from the edges of the plantation. The windrows shall be secure, with the material tightly packed and stacked to a height and width of between 1 and 1.5 m.

Shrub Pruning

5 (05/08) All pruning cuts shall be made in accordance with BS 7370 Part 4.

6 Pruning shall be undertaken using secateurs and handsaws. Mechanical hedgecutters may only be used on compact small-leaved species which have dense foliage. Pruning shall be undertaken to promote flowering and fruiting in accordance with the species and age of the plant. Stems shall only be removed so as to retain the natural appearance of the individual plant species.

7 All broken and badly damaged branches shall be pruned from the plants.

8 Species shall be pruned in accordance with the following categories:

(i) Shrubs grown for coloured stems

All stems shall be cut down to 50 mm above ground level, or to 50 mm above the coppice stool if cut down previously, at a frequency to maintain a succession of coloured stems, as stated in Appendix 30/10. This shall be carried out during the dormant season but outside the bird nesting season.

(ii) Shrubs which flower on Current Season Wood

All wood which has borne flowers shall be removed immediately after flowering and all young wood retained to bear flowers in the following year.

(iii) Shrubs which flower on Previous Season Wood

All the previous season wood shall be cut back to within two or three buds of the old wood.

(iv) Shrubs which flower on Old Wood

One or two of the oldest stems from each plant shall be removed completely, crowded and weak growth shall be thinned out and the young shoots shall be cut back to fresh growth on the main stems.

(v) Roses

For modern varieties of groundcover and bush roses, all growth shall be pruned back to the point of the previous cut. Hedge trimmers may be used on these modern varieties. For other varieties of groundcover and floribunda roses, all growth shall be pruned back to an outward facing bud, 5 buds from the base of the previous season

wood in March. For hybrid teas, all growth shall be pruned back to an outward facing bud, 3-5 buds from the base of the previous season wood in March. For Rugosa cultivars, all growth shall be pruned back to an outward facing bud, 3-5 buds from the base every five years, in March.

(vi) Shrubs which Require Trimming

Pruning shall be undertaken back to the flowering heads, but not into the old wood, immediately after flowering.

(vii) Overgrown shrubs

Where stated in Appendix 30/10, shrubs shall be coppiced back to within 300 mm of the base in late winter. The final wound surface shall be smooth and angled to allow water run-off.

9 All growth which extends over the footway or carriageway which is dead, dying or hazardous shall be removed. All shrubs that are encroaching upon, or obscuring visibility of adjacent signs, structures, electrical equipment, gates or visibility splays shall be pruned. All suckers shall be removed from rootstocks.

Climbing Plants

10 Climber growth which extends over the footway or carriageway which is dead, diseased, dying or hazardous shall be removed. Species which are encroaching onto adjacent trees and shrubs shall be pruned. The climbers shall be inspected at regular intervals during the growing season and any branches which are not secure shall be re-attached to the supporting netting or wires. Any repairs or replacements to the supporting structures for the climbers shall be undertaken as necessary.

Hedge Maintenance

11 The Contractor shall liaise with adjacent landowners regarding the access arrangements and working hours described in Appendices 1/7 and 1/9 in order to carry out hedge maintenance. All arisings shall be disposed of by the Contractor.

12 No trimming, laying, or clipping shall take place during the bird nesting season. The frequency and timing of cutting shall be as given in Appendix 30/10.

13 All cutters and blades shall be sharpened and set according to the manufacturer's recommendations.

14 Where growth to be cut is up to two years old, highway hedgerow planting may be maintained with tractor mounted side arm flails, provided that they cut cleanly without leaving ragged ends. For ornamental

hedges and hedges where hard growth over two years old is to be cut, only reciprocating blade cutting machinery shall be used. Large leafed evergreen hedges shall be pruned with secateurs to avoid half cut leaves.

15 Growth shall be reduced to the point of the previous cut and on completion, both sides of the hedge shall be perpendicular and the top shall be level and at right angles to the sides. Exceptions to this shall be as described in Appendix 30/10.

16 All clippings lodged in the top or sides of the hedge shall be removed off Site. During the cutting operation all litter and debris within the structure of the hedge shall be removed off Site.

17 All hedge laying works shall be carried out in a manner to ensure that the newly laid hedge possesses a neat, uniform appearance of even density. The work shall be carried out ensuring that the cut hedge plants are able to re-grow vigorously.

18 All hedge laying work shall only be carried out during the dormant season, but not during periods of extreme frost.

19 The terms for the component parts of a cut and laid hedge are as follows:

- (i) Stakes - pointed greenwood stems or hardwood cleft driven vertically into the ground to provide support to the laid hedge plants.
- (ii) Binders - flexible greenwood stems woven together along the top of the hedge to hold it down and provide support to the stakes (applicable to Midland Hedge only - see sub-Clause 3010.20).
- (iii) Cut-Side - the side of the hedge from which the hedge plants are cut (applicable to Midland Hedge only - see sub-Clause 3010.20).
- (iv) Brush Side - the side facing the adjoining field or forestry plantation through which the hedge brush protrudes (applicable to Midland Hedge only - see sub-Clause 3010.20).
- (v) Stoving - the exposed stump of a laid hedge plant.
- (vi) Coppice Stool - the cut stump of a hedge plant.
- (vii) Pleacher - a live hedge plant which has been cut and laid to form the body of the hedge.

20 If required in Appendix 30/10 that hedges are to be laid, the work shall be carried out in one of the following styles, as described in Appendix 30/10:

- (i) Midland Hedge - All the pleachers shall be cut from one side of the hedge and laid diagonally across the line of the hedge so that all the brush protrudes on the opposite side. The hedge shall be supported by greenwood stakes and binders.
- (ii) Straight Hedge - All the pleachers shall be cut and laid along the line of the hedge and inter-woven between hardwood, cleft stakes spaced at 1 m intervals.
- (iii) Any other regional variation described in Appendix 30/10.

21 All cutting tools used on the hedge laying works shall be maintained in a sharp condition to ensure that cut surfaces are smooth and made cleanly without tearing the wood grain. The cuts which facilitate the laying of a pleacher shall be made with an axe or billhook only. Chainsaws shall only be used in the preparation of the hedge and the trimming of hedge stovings.

22 When a mixed species hedge is to be laid, the individual species shall be treated in one of the following ways, as required in Appendix 30/10:

- (i) Cutting and laying; or
- (ii) Coppicing - hedge plants shall be felled at a height not exceeding 100 mm above ground level leaving their stumps with an angled surface to shed water and in a form to promote vigorous regrowth; or
- (iii) Removal - unwanted hedge plants shall be felled to ground level and their stumps either physically grubbed out or chemically treated to prevent regrowth; or
- (iv) Retention - certain young hedge plants which are either self set seedlings or growing from a healthy coppice stump may be selected to be retained to grow on as hedgerow trees.

23 Unless otherwise stated in Appendix 30/10, the following materials shall be used for staking and/or binding:

- (i) Midland Hedge
 - (a) Stakes shall be obtained from broadleaved species such as *Castanea sativa*, *Quercus robur*, *Fraxinus excelsior* or *Acer pseudoplatanus*. Stakes from any *Salix* or *Populus* species shall not be used. The stakes shall be pointed and cut from live greenwood stems not more than twelve weeks prior to being used. They shall be at least 1.5 m in length and of 30 mm to 60 mm diameter throughout.

- (b) Binders shall be cut from live greenwood stems of *Corylus avellana*, *Fraxinus excelsior* or *Salix viminalis* not more than six weeks prior to being used and shall be at least 2.5 m in length and 10 mm to 30 mm diameter throughout. Binders shall not be trimmed until immediately prior to use.
- (ii) Straight Hedges
- (a) Stakes shall be cleft and of a hardwood species stated in Appendix 30/10, pointed at one end, 1.8 m in length and 75 mm to 100 mm in width throughout.
- 24** All side branches from any hedge plants which may impede or obstruct the laying operation or detract from the style and appearance of the completed hedge shall be removed.
- 25** Any branches which are tangled or interwoven with other hedge plants shall be removed to ensure that the hedge plant to be laid is free to be guided into position. Any dead, damaged or diseased wood, along with any other foreign objects and debris, shall also be removed before the plant is laid.
- 26** All plants shall be laid in the same direction unless a gap is likely to occur. All laid hedge plants shall, as far as possible, be interwoven into each other and the supporting hedge stakes to ensure maximum stability. On sloping ground, all hedge plants shall be laid in an uphill direction except when back laying is required to fill a gap. On level ground the direction of laying shall be in the direction of traffic flow on that side of the carriageway except when back laying is required to fill a gap.
- 27** Stakes shall be driven centrally down the line of the hedge to offer support to the newly laid hedge plants in accordance with the following staking requirements, specific to the two different styles of hedge described in sub-Clause 3010.20, or as required in Appendix 30/10:
- (i) Midland Hedges - greenwood stakes of sufficient length to ensure that at least 150 mm protrudes above the top of the laid hedge shall be driven in to a minimum depth of 300 mm at 0.5 m intervals along an even, straight line. When the binders have been fitted along the top of the hedge, the stakes shall be cut off 75 mm above the binders with a sloping cut, which shall face the cut side of the hedge.
- (ii) Straight Hedges - Cleft stakes of sufficient length to ensure that 100 mm protrudes above the top of the laid hedge shall be driven in to a minimum depth of 300 mm at 1.0 m intervals along a straight line.
- 28** Only greenwood binders shall be used along the top of the hedge. These shall be tightly twisted around themselves and each stake in order to hold the laid hedge down and offer support to the line of stakes. A minimum of four binders shall be included at any one point and additional binders introduced at each stake in order to maintain the required number.
- 29** When the hedge laying works at any location are complete, any loose branch or twig ends shall be trimmed from the cut side and top of Midland Hedges and also from the brush side if necessary and from both sides and the top of Straight Hedges, to leave a neat and compact appearance.
- 30** All cut material and other arisings shall be removed off Site by the end of each working day, unless otherwise required in Appendix 30/10.
- 31** Where any significant gap exists in the hedge after it has been laid, it shall be planted up with new hedge plants in accordance with Clause 3006. The size of the plants, species and planting density/pattern shall be as specified in Appendix 30/10.
- Individual Established Trees in Urban Streets**
- 32** Individual trees shall be defined as feathered, standard and extra heavy standard trees planted as single specimens rather than as part of a planted group. Street trees in footways, tree grilles and those planted as specimens within a group shall be defined as 'individual trees' as well as any other young or semi-mature trees identified in Appendix 30/10.
- 33** The individual trees shall be inspected annually during the growing season, and maintained as follows:
- (i) All weeds around the base of the tree shall be removed, to a radius of 500 mm in grass or to a whole tree station if in the footway or a tree grille. Removal shall be by hand and/or chemical means as appropriate. When using herbicide the requirements of Clause 3001 and sub-Clause 3002.2 shall apply.
- (ii) Tree supports, stakes, ties and anchoring systems shall be inspected and adjusted.
- (iii) When trees can stand unsupported, stakes and/or ties shall be removed. Stake holes shall be backfilled with topsoil which shall be lightly firmed.
- (iv) Tree guards and grilles shall be inspected and adjusted.

- (v) The levels of aggregate, mulch and soil beneath grilles shall be made up to the same level as the surrounding surface.
- (vi) Pruning shall be carried out in accordance with sub-Clauses 3010.5, 6 and 7, including removal of epicormic shoots and the removal of deadwood. Competing secondary leader shoots, and closely spaced, duplicated branches with potentially weak or tight forks shall be removed.
- (vii) The Contractor shall report to the Overseeing Organisation any defects requiring further action.

Arboriculture: General

34 All work specified in this Clause shall be undertaken in accordance with BS 3998, except that cuts and wounds shall not be treated with a fungicidal sealant, bitumen or latex paint, unless otherwise stated in Appendix 30/10.

35 Where permission has been obtained to carry out any work under this Contract on trees covered by a Tree Preservation Order or in a Conservation Area this shall be noted in Appendix 30/10.

36 The Contractor shall comply with the current Forestry and Arboriculture Safety & Training Council (FASTCO) recommendations in relation to all aspects of the arboricultural works.

37 If any defect is found within a tree during the course of carrying out work which would render the specified work inappropriate or inadequate, the Contractor shall cease work and notify the Overseeing Organisation who shall agree any appropriate alternative action which is to be taken. Where such a defect constitutes an imminent threat to public safety or property, the Contractor shall take appropriate action to exclude the public from the area of danger, notify the Overseeing Organisation immediately, and protect the location until the Overseeing Organisation issues further instructions.

38 No tree work shall be carried out during periods of extreme weather except in emergency situations. Except in an emergency incident, the removal of live wood from any species shall not be undertaken during periods of severe frosts. In such cases, the work carried out shall be the minimum required to render the tree safe or to allow removal from the carriageway.

39 Except in an emergency incident, tree surgery, felling, thinning and coppicing operations shall only be undertaken within the dormant season and outside the bird nesting season.

40 All mature trees shall be checked for bat roosts in any cavities, before arboricultural works are carried out. Any bat roosts shall be reported to the Overseeing Organisation and no works shall be carried out on any tree in which bat roosts are located without further written instructions from the Overseeing Organisation. The inspection for bat roosts and any subsequent action thereon must be carried out by appropriately licensed personnel.

41 All tools shall be surface sterilised with methylated spirits after use on trees which are known or suspected to be diseased.

42 When using tower wagons or cranes the Contractor shall ensure that manufacturer's safety limits are not exceeded. Demountable towers shall have all fastening brackets secured and shall only be used on the appropriate vehicle.

43 Climbing irons shall not be used in the pruning of live trees and shall only be used during felling or dismantling operations when this is necessary during emergency works.

44 No trees are to be used as winch anchors without the prior consent of the Overseeing Organisation and these shall be protected. Alternative types of winch anchor may be used provided they are appropriate for the conditions prevailing at the Site and the task to be undertaken and are of a recognised arboricultural type.

Tree Surgery

45 Tree size categories reflecting the extent to which tree surgery and felling works shall be carried out are stated in Appendix 30/10.

46 Each tree shall be individually considered and the general description of work to be undertaken shall be interpreted in relation to the species, shape, size, character and condition of each individual tree.

47 All operations shall be carried out so as to leave a well-balanced tree crown.

48 The Contractor shall prune back all dead, damaged or diseased wood to its point of origin. The cutting of the branch shall not damage the branch collar if taken off at a main limb or on the bole. The triple cut method shall be used when carrying out the pruning operation and the final wound shall be smooth and free of snags.

49 All damage to main limbs or boles shall be cleaned to remove damaged or diseased tissue back to, but not into, live wood or bark. The final wound shall be smooth and free of snags.

50 The repair of major bark wounds (over 75 mm in diameter or length) shall consist of the removal of dead, damaged and loose bark and in addition any splintered

wood back to the line of newly forming callus growth ensuring that no live tissue is damaged. The size of the wound shall be kept to a minimum and its final shape shall be, as far as possible, rounded and free from sharp corners.

51 Both wet and dry cavities shall be inspected and probed to determine the extent of decay and ascertain their significance in relation to the structure and safety of the tree or branch. Where possible, all accumulated debris and loose decayed wood shall be removed from such cavities and where specified in Appendix 30/10, the opening of the cavity covered with a fine mesh wire netting to prevent a further build up of debris. This covering shall be secured with felt tacks in such a way that it does not prevent natural callus formation but allows easy removal for future inspection.

52 Regulative pruning shall be carried out in accordance with the Arboriculture Research Note 48/83/PATH and Arboriculture Research Note 116/93 as issued by the Arboricultural Advisory and Information Service. Pruning cuts shall wherever possible be made at a fork or at the main stem. All wounds shall be kept as small as possible. The final pruning cut shall be made so that both the branch, branch bark ridge and branch collar remain intact.

53 The Contractor shall carry out as part of tree pruning operations any of the following works as may be necessary on an individual tree:

- (i) Removal of basal sucker growths and epicormic growth from the trunk at ground level up to the base of the tree's natural crown.
- (ii) Repair of minor bark wounds on the trunk and main branches by the removal of any dead, damaged or loose bark back to undamaged tissue or to the line of newly forming callus growth. In either case the size of wound shall be kept to a minimum.
- (iii) Removal of any foreign objects from the tree where this can be done without inflicting any undue damage to the tree concerned.
- (iv) Removal of reverted branches from cultivars of tree species.
- (v) Severance of undesirable climbing plants at base of trunk.

54 Where crown lifting is directed in Appendix 30/10 the lower branches and branchlets of the tree shall be removed to the height stated in Appendix 30/10 in order to increase the clearance under the canopy of the tree.

55 Where crown thinning is required in Appendix 30/10 a proportion of secondary and small live branch growth

throughout the crown shall be removed to produce as far as possible an even density of foliage around a well spread and balanced branch structure. Crossing, weak, duplicated and damaged branches shall be removed where this will not spoil the overall shape.

56 Where crown reduction or reshaping is required in Appendix 30/10 the crown shall be reduced in size, whilst preserving as far as possible a natural shape. This may involve cutting back both main and subsidiary branches to a side bud or branch, to leave a flowing line without stumps.

Tree Felling

57 Where straight felling is required in Appendix 30/10 the whole tree shall be felled to within 100 mm of ground level, where necessary with the assistance of a powered or hand winch.

58 Where sectional felling is required in Appendix 30/10 the tree shall be felled in sections of a size appropriate to the location, using ropes where necessary to lower the sections.

59 The height at which the stump shall be cut shall be as stated in Appendix 30/10, either:

- (i) as close to the ground level as possible; or
- (ii) where the tree is growing in a hedge or fence line the stump shall be left level with the top of the hedge or fence; or
- (iii) at any other height stated in Appendix 30/10.

The final cut shall leave the stump with a smooth, level surface.

60 Where required in Appendix 30/10, stump treatment shall be carried out within 24 hours of felling. A stump-killing herbicide with colouring agent, used in accordance with Clause 3001 shall be applied by means of drilling or frill girdling in the cambium zone of the cut stump.

61 Any re-growth from the cut stump shall be treated during the following season in accordance with sub-Clause 3010.60 and Clause 3001.

62 Where required in Appendix 30/10, the complete root, including buttress and surface roots arising from or near to its base, shall be removed, either by:

- (i) stump grinding to a minimum depth of 300 mm; or
- (ii) stump grubbing by means of excavation or winching.

63 Following removal of stumps by any means, the void shall be filled with topsoil to match existing levels in grassed areas. In paved areas the material shall be removed down to formation level to allow full

reinstatement of the paved area. All arisings shall be disposed of as required in Appendix 30/10.

Thinning and Coppicing

64 Thinning operations shall be undertaken by means that avoid the need for pruning or crown lifting of retained plants, particularly to those on the outer edges.

65 Thinning shall be carried out throughout the planted areas identified in Appendix 30/10. Unless otherwise stated in Appendix 30/10, thinning shall favour the retention of the strongest trees and those that offer the longest future useful life. Adequate spacing shall be created between the trees and shrubs to promote healthy future development of the crowns of the remaining trees. Edge treatment shall favour the maximum retention of lower branches and an understorey of younger trees or shrubs where these are present. All plants to be thinned shall be cut down to between 25 - 30 mm of ground level parallel with the slope of the ground.

66 Plants to be coppiced shall be cut down to 50 mm above ground level if being coppiced for the first time. If coppiced previously, the plants shall be cut back to the previous point of coppicing but with the cuts positioned outside the branch collar. The final wound surface shall be smooth and angled to allow water run-off. Cut surfaces shall not be treated with herbicide.

Scrub Control in Grass

67 No scrub control shall be carried out during the bird nesting season.

68 Where required in Appendix 30/10, control of scrub species shall be carried out. Species to be controlled shall be as specified in Appendix 30/10.

69 The tree and shrub species to be controlled shall have a stem diameter and maximum height or sizes as stated in Appendix 30/10.

70 Where required in Appendix 30/10, scrub control is required on rock ledges and scree.

71 The following operations shall be carried out on specified species, as required in Appendix 30/10:

- (i) Where there are large areas of scrub to be controlled, a translocated herbicide shall be applied to the specified species during a period of active growth, in accordance with Clause 3001. After the herbicide application has been effective all dead vegetation shall be cut down to ground level and removed off Site.
- (ii) Specified species shall be cut down to between 50 and 100 mm above ground level.

For stumps of sufficient diameter, the Contractor shall furrow or frill girth 50% of the stump and bark and apply a stump-killing herbicide, in accordance with Clause 3001. An approved vegetable dye shall be included to clearly indicate the stumps have been treated.

- (iii) Specified species shall be cut down to 50 mm above ground level, and the plants allowed to re-grow. The Contractor shall then apply a translocated herbicide during a period of active growth, in accordance with Clause 3001. This re-growth treatment is likely to be in the year following initial cutting.
- (iv) Specified species shall be cut down to 50 mm above ground level, and removed off Site. The plants will be allowed to re-grow.

3011 Management of Waterbodies

1 The following operations shall be undertaken where required in Appendix 30/11.

2 All rubbish and debris shall be removed from the entire surface of the waterbody, including any partially submerged items.

3 Inlets and outlets as detailed in Appendix 30/11 shall be inspected twice per year usually in February and October and their condition reported to the Overseeing Organisation.

Weed Control

4 Undesirable species or areas of vegetation to be subject to weed control shall be as described in Appendix 30/11.

5 Herbicide applied to weeds in or near waterbodies, including banks adjacent to ditches, shall be used in accordance with Clause 3001 and sub-Clause 3002.5.

6 Where required in Appendix 30/11, weeds in the waterbodies shall be removed by handweeding in accordance with sub-Clause 3002.8 or by mechanical means.

Silt

7 Silt depth shall be inspected once per year in April, and the depth and condition reported to the Overseeing Organisation.

8 Where required in Appendix 30/11, silt shall be removed. The depth of silt to be removed, available deposition areas for drying-out, requirements for disposal and access shall be as stated in Appendix 30/11.

Reedbeds and Marginal Plants

9 Where required in Appendix 30/11, reedbeds shall be inspected twice per year in February and October or at other times stated in Appendix 30/11, and their condition reported to the Overseeing Organisation.

10 The timing and methodology of inspection and operations shall avoid affecting habitats of birds, fish and invertebrates. The presence of protected or rare species shall be reported to the Overseeing Organisation.

3012 Special Ecological Measures

1 The maintenance works specified under Clause 3012 shall be carried out for the period of time stated in Appendix 30/12.

2 Special Ecological Measures works shall be carried out in the seasons stated in Appendix 30/12.

Tunnels, Fencing and Underpasses for Wildlife

3 Tunnels, ledges, fencing and underpasses for wildlife shall be installed in the manner and locations detailed in Appendix 30/12.

4 Wildlife grilles shall be installed on the entrances to drains, in the manner and locations detailed in Appendix 30/12.

5 Tunnels, fencing, underpasses, ledges and grilles in the locations stated in Appendix 30/12 shall be inspected twice per year in February and October, and their condition reported to the Overseeing Organisation. Any obstructions shall be removed from tunnels, underpasses and ledges and the arisings removed off Site. Any areas of standing water or poorly drained areas at the entrances to tunnels or underpasses shall be reported to the Overseeing Organisation and work carried out if necessary, as instructed by the Overseeing Organisation.

Reflectors

6 Reflectors shall be installed in the manner and locations detailed in Appendix 30/12.

7 Reflectors in the locations stated in Appendix 30/12 shall be inspected once per month, cleaned and repaired as necessary and any obstructing vegetation removed.

Artificial Nests, Boxes, Perches and other Wildlife Shelters

8 In the locations stated in Appendix 30/12, bat boxes, dormice or bird nesting boxes or roosting perches shall be installed, as detailed in Appendix 30/12.

9 Bat boxes or roosts, dormice or bird nesting boxes and roosting perches in the locations stated in Appendix 30/12 shall be inspected as specified in Appendix 30/12 and their condition reported to the Overseeing Organisation. The inspection shall include clearing out of any abandoned nests, and the arisings removed off Site. Only experienced operatives are to carry out this work and only licensed operatives are to work with the legally-protected species listed in Appendix 30/12.

10 Bat boxes, dormice or bird nesting boxes and roosting perches shall be repaired when necessary, as detailed in Appendix 30/12 or as instructed by the Overseeing Organisation.

Other Habitat Creation Measures

11 Other habitat creation measures in the locations stated in Appendix 30/12 shall be inspected as detailed in Appendix 30/12 and their condition reported to the Overseeing Organisation.

12 The known locations of Protected Species or their habitats are noted in Appendix 30/12. This information is confidential.

13 Where stated in Appendix 30/12, the Contractor shall obtain a licence or use only licensed operatives for works in the vicinity of protected species.