Agar Grove Regeneration Phase 2A

Client:

LONDON BOROUGH OF CAMDEN

HARD & SOFT LANDSCAPE SPECIFICATION

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10A Project background

1. 10A Project Background
   The project comprises the regeneration of the existing 1960's built Agar Grove estate with predominantly residential refurbishment and replacement homes. The scheme includes re-homing existing residents with a single decant process and the provision of new homes of varying tenure. The scheme is tenure blind, the public realm, communal and private external spaces are designed with a common palette of materials and details. The architecture is designed as Passivhaus throughout. The site wide masterplan is phased, with Phase 1A completed in 2018 and Phase 1B completed in 2022 and Phase 1C under construction. Other uses on site to be retained with full access and servicing during the construction period include a children's day nursery and L&Q Housing plots. The site includes a number of existing trees to be retained, some protected by TPO's.

20 Core values

1. The landscape concept behind the masterplan was re-connecting Agar Grove back into it's surrounding context with a new coherent layout of streets, squares and gardens. Awkward level changes, hidden corners and under-surveilled open spaces were a feature of the existing estate designed out in the new masterplan. Materials are to be consistent, robust, easily maintainable to the highest environmental credentials, whilst delivering a high quality finish across the phased masterplan. SUDs principles incorporated across the scheme, with permeable paving, rain gardens, swales, rainwater collection and green and brown roofs. Biodiversity is promoted through the planting palette, living roofs and a series of integral habitat boxes. Materials and planting are used to promote the clear hierarchy of pubic realm streets, communal residents gardens and private garden spaces. Existing trees are retained where possible and strengthened with new tree planting for the long term

Ω End of Section

A02
Environmental impact

Clauses

10 Introduction

1. The Contractor/Sub Contractor shall, wherever feasible, take specific measures to maximise sustainability and minimise environmental impact.
2. The Contractor's/Subcontractor's Tender shall be accompanied by the Contractor's/Subcontractor's Company Environmental Policy which should consider the following aspects:
    2.1. Material selection
    2.2. Energy Use
    2.3. Transport
    2.4. Maintenance

20 Material selection

1. Materials to be selected for minimum environmental impact during production, minimum waste and recyclables. Critical issues are:
    1.1. Choice of all components with regard to their overall environmental impact (BRE: *The Green Guide to Specification*, 4th Edition, 2009)
    1.2. Locally produced components and materials chosen wherever possible
    1.3. Policies in place to ensure minimum waste in production and site processes
    1.4. Strategy developed for recycling of all waste materials from production process
    1.5. Clearly marked or described recyclable components
    1.6. Design and specify finishes to ease recycling at end of service life
    1.7. Timber products chosen from certified sustainable sources with recognised accreditation e.g. Forestry Stewardship Council (FSC) Scheme
    1.8. Avoidance of ozone depleting substances
    1.9. Minimum use of Aluminium and selection of recycled aluminium where used
    1.10. Avoidance of toxic water repellent sealants
    1.11. Alternative products to uPVC

30 Energy use

1. Energy use during processing and manufacture. Critical issues are:
    1.1. Stone materials sourced from quarries where damage to the environment is minimised
    1.2. Avoidance of components requiring high-energy input in manufacturing process if alternatives requiring less energy input are available
    1.3. Using aluminium manufactured by sustainable energy producers (e.g. hydro)
    1.4. Use of companies developing more energy efficient processes

40 Transport

1. Critical issues are:
    1.1. Minimising distance materials/components travel prior to fabrication
    1.2. Minimising distance materials/components travel after fabrication
    1.3. Reducing environmental impact by use and planning of transport

50 Maintenance

1. Critical issues are:
    1.1. Maximise life expectancy of components
    1.2. Clear maintenance instructions provided to optimise performance of fixings and reduce the need for replacements
    1.3. Use of low energy maintenance materials and processes
    1.4. Use of non-toxic maintenance materials
    1.5. Use of maintenance materials that do not damage the environment

60 Biosecurity

1. Biosecurity refers to a set of precautions that aim to prevent the introduction and spread of harmful organisms. These include non-native tree pests, such as insects, and disease-causing organisms, called pathogens, such as some bacteria and fungi.
2. There has been a significant increase in the number of pests and diseases being introduced to the United Kingdom since the early 2000s. This demonstrates the need for action to be taken in order to provide our trees, woods, forests, public gardens and agriculture with greater protection. By implementing appropriate biosecurity measures, the risk of introducing and spreading pests and diseases can be significantly reduced.
3. Supplying nurseries, and their sub suppliers, and Landscape Contractors must take full and detailed specific measures to provide assurances that all stock is fully compliant with the latest UK Government legislation in respect of potential pests and diseases and associated importation notifications, approvals and certification.
4. A copy of all suppliers' biosecurity policies and stock quality assurances must be supplied with the tender return
5. Further requirements for plant procurement and bio-security protocols are set out in Sections: **Q30, Q31 & Q32** of this specification.

65 Biosecurity - uk guidance & protocol

1. All supplying nurseries must:
    1.1. be fully compliant in respect of all restrictions regarding bringing certain plants and trees into the UK from the EU and beyond
    1.2. conform with all necessary notifications in respect of any import, particularly in respect of plant passports and all latest recommendations and associated guidance from the Animal and Plant Health Agency (APHA) and the Department for Environment Food & Rural Affairs (DEFRA)
2. Additional advice and notifications may also include consultation with:
    2.1. Forestry Commission (FC)
    2.2. Royal Horticultural Society (RHS)
    2.3. Horticultural Trades Association (HTA)
    2.4. International Association of Horticultural Producers (AIPH)
    2.5. Arboricultural Association (ARB)
    2.6. Landscape Institute (LI)
3. At time of tender, all scheduled plant species shall be reviewed in respect of biosecurity policies. Any concerns regarding species and cultivars that may be prone to notifiable pests and/or diseases must be highlighted and an appropriate action agreed.
    3.1. Risk mitigation actions may include species substitution, quarantine strategy compliant with UK Government Legislation, or other actions as recommended by the above guidance.

70 Biosecurity - notifiable pests & diseases

1. The following clauses particular requirements for a number of notifiable pests and diseases.
2. All growers/suppliers must comply with these clauses and confirm full compliance with all UK guidance
    2.1. Tender returns shall include a copy of all biosecurity policies and protocols in respect of all notifiable diseases and pests, particularly those described in more detail in the following clauses.
3. The following clauses are not an exhaustive list, but highlights the risk to the UK from an ever-increasing list of pest and diseases. Accordingly, a review of the growers' / suppliers' comprehensive biosecurity policies will be a key consideration in respect of an award for the project plant procurement contract.
    3.1. The key elements the policy must include are:
        3.1.1. 1. Comprehensive awareness of biosecurity issues and all associated guidance, restrictions and notifications.
        3.1.2. 2. Documented input and review in respect of the tendered plant schedule and drawings and associated biosecurity statements and observations.
        3.1.3. 3. Methodology for plant monitoring process for present and new ‘’at risk species’’ as per government updates.
        3.1.4. 4. Confirmation on origin / propagation of all tendered plants and methodology for monitoring sub suppliers’ protocols
        3.1.5. 5. Where necessary quarantine holding policies including incoming and outgoing plant control, internal and field inspections and associated traceability.
        3.1.6. 6. Working methodology with landscape contractors and in particular all associated required notifications on call up and transportation and local regional restrictions.
        3.1.7. 7. Sustainable production statement & policy
        3.1.8. 8. CVs of core management and experience on biosecurity protocol.

71 Biosecurity - xylella

1. Xylella fastidiosa is one of the most dangerous plant bacteria worldwide, causing a variety of disease with a potentially large impact on UK agriculture, public gardens, the horticultural trade and the wider landscape environment
2. Anyone receiving host plants from suppliers in the UK must ensure that they are accompanied by a valid plant passport confirming they have been sourced from disease free areas/sites.
3. Once/if the UK leaves the EU, passport-able stock generated from the EU must arrive with a valid plant health (phytosanitary) certificate.
4. The already extensive list of host species recorded in Europe is likely to grow and includes species of oak, maple, hebe and higher risk hosts such as Coffea, Lavandula dentata, Nerium oleander, Olea europaea, Polygala myrtifolia and Prunus dulcis, as well as many other popular plants for gardens, landscapes and forestry. The host list is updated frequently see below:
    4.1. https: //ec.europa.eu/food/plant/plant_health_biosecurity/legislation/emergency_measures/xylella-fastidiosa/susceptible_en
    4.2. www.gov.uk/government/organisations/animal-and-plant-health-agency
    4.3. https: //www.gov.uk/guidance/plant-health-controls
5. The following plant species are proposed within the scheme and are considered host plants:
    5.1. n/a

72 Biosecurity - fireblight

1. Fireblight is a serious disease caused by the bacterium Erwinia amylovora of apples, pears, Rosaceae trees and shrubs.
2. Its hosts include:

3. - Juneberry (Amelanchier)- Flowering quince (Chaenomeles)- Cotoneaster (Conteaster)- Hawthorn (Crataegus)- Quince (Cydonia)- Loquat (Eriobotrya japonica)- Apple (Malus)- Medlar (Mespilus germanica)- Firethorn (Pyracantha)- Pear (Pyrus)- Mountain ash (Sorbus aucuparia)
4. Fireblight is a notifiable disease and statutory action is being taken to prevent its introduction and spread

73 Biosecurity - sudden oak death (phytophthora ramorum & phytophthora kernoviae)

1. Phytophthora ramorum (P ramorum) is an exotic fungus-like plant pathogen which causes damage to trees, shrubs and other plants. It is also known as ‘sudden oak death’.
2. In the UK it has been found mainly on container-grown rhododendron, viburnum and camellia plants in nurseries.
3. It has also been found on various types of:
4. - heathers- witch-hazel- laurel- honeysuckle- lilac- yew- Californian bay laurel- oak species- other trees - ash, European beech, horse chestnut, sweet chestnut, sycamore and Winter’s bark
5. Phytophthora ramorum is a notifiable pest and statutory action is being taken to prevent its introduction and spread

74 Biosecurity - oak processionary moth

1. The caterpillars (larvae) of oak processionary moth (OPM) are pests of oak trees, and a hazard to human and animal health.
2. OPM was first accidentally introduced to England in 2005, and is subject to a government-led programme of survey and control to minimise its population, spread and impacts.
3. OPM is subject to regulations intended to minimise the risk of further introductions to the UK and spread to new areas.
    3.1. Forestry workers, tree surgeons, landscapers, nursery staff and anyone else involved in growing, moving, managing and importing oak trees and plants must comply with these regulations.
    3.2. Guidance on how to identify and report OPM can be found on the links below, including an Oak Tree Owners’ OPM Manual produced by Forest Research.
    3.3. https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/
    3.4. https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/opm-manual-1-introduction-and-contents/
4. Legislation governing OPM in the UK is published on the government's legislation website.
5. The legal requirements for importing oak trees and plants to the UK from the European Union, and beyond, are set out on GOV.UK.

75 Biosecurity - ash die back

1. The appearance of the Hymenoscyphus fraxineus fungus in Britain has meant that the future of common ash (Fraxinus excelsior) as a woodland tree species is under serious threat.
2. The disease is present in all counties of England, and experience in mainland Europe suggests that the majority of ash trees in woodlands infected with the disease will decline and die over the next 10–15 years.

76 Biosecurity - phytophthora alni

1. All alder (Alnus spp.) species are threatened by a lethal disease, which was first discovered in 1993 in Britain.
2. The causal agent is a previously unknown species of Phytophthora, named Phytophthora alni, which is highly specific to alder.

3. The disease is now considered to be one of the most important diseases of natural ecosystems in Europe for the last twenty years.
4. Disease management:
    4.1. Evaluate nursery stock for infection before purchase
    4.2. Ensure good practice in nurseries to prevent infection
    4.3. Planting alder on river banks that are liable to flooding and where the disease occurs presents a high risk

Ω End of Section

A13
Description of the works

Clauses

10 Scope of works

1. The external works generally comprise, but are not limited to, the following:
2. 10 Scope of Works
   - Asphalt and block paved carriageway and footways within streetscape;
   - Exposed aggregate concrete kerbs and edgings;
   - Metalwork boundary railings to varying heights with soft close gates to match;
   - Low retaining walls with brick coping/brick facing;
   - Steps with tactile paving and handrails;
   - Anti-ram bollards;
   - Visitor cycle stands;
   - Bench and stool seating;
   - 0-5 years doorstep play equipment;
   - Permeable rubber crumb safety surfacing;
   - Metalwork planter edges;
   - Works within existing tree Root Protection Zones (RPZ) with working methodology and detailing requirements in accordance with BS5837:2012 "Trees in Relation to Design, Demolition and Construction to Construction - Recommendations" and the approved AIA.
   - Specimen tree planting with aeration/irrigation pipes, underground guy systems, drainage to detail, root barriers where necessary;
   - Proprietary specialist soil to trees in hard landscape;
   - Shrubs, hedgerows, climbers, mulches to all planted beds, habitat boxes;
   - Topsoil and associated ameliorants;
   - Free draining subsoil;
   - Lighting to the M+E Engineer's specification;
   - Living roofs to the Architect's specification.

   Scope Note: Arboricultural Consultant to be informed by the Contractor, within an time period agreed in advance of commencement, of works on site in the vicinity of existing trees to be retained. Arboricultural Consultant to be present on site at breaking ground within the vicinity of the predicted RPZ of the existing trees. No works shall proceed within the RPZ of existing trees to be retained without a methodology being approved by the Arboricultural Consultant.

20 Works by others

1. The Contractor shall be fully acquainted with the extent of the previous work by others on the site and with the position of services existing and proposed. If required this shall include for hand digging to verify the position of services.

Ω End of Section

A14
General conditions

Clauses

10 Standards and codes of practice

1. Where a British Standard or Code of Practice exists appropriate to any or all of the materials and any operations necessitated by the works or part thereof, such operations or materials shall comply with the latest edition of that British Standard or Code of Practice unless otherwise stated.

15 Definitions - units, abbreviations, etc.

1. The definitions used in this Document are as follows:
2. "BS" shall mean British Standard
3. "CP" shall mean British Standard Code of Practice
4. "mm" shall mean millimetre
5. "cm" shall mean centimetre
6. "m" shall mean metre
7. "m2" or "m²" shall mean square metre
8. "m3" or "m³" shall mean cubic metre
9. "L" or "ltr" shall mean litre
10. "ml" shall mean millilitre
11. "t" or "T" shall mean tonne (metric)
12. "BR" shall mean bare root
13. "RB" shall mean rootballed
14. "Tr" shall mean transplant
15. "C" shall mean containerised
16. "Weeds" shall mean all plants not within the design

20A Definitions - roles

1. The definitions used in this Document are as follows:
2. "CA" shall mean Contract Administrator. For this Contract this shall be: tbc
3. "Contractor" shall mean the Main Contractor and/or the contractor/sub-contractor responsible for completing the element of the works covered by that specification clause
4. "Main Contractor" shall mean the contractor appointed by the Client to complete/oversee of all the construction works comprising this Contract
5. "Sub-contractor" shall mean a specialist contractor appointed by the Main Contractor to carry out a particular element of works on their behalf
6. "Landscape Contractor" shall mean the specialist landscape contractor appointed to carry out the soft landscape works comprising this Contract, as defined below:

   6.1. tbc
7. "Principal Contractor" shall mean the Contractor appointed by the Client to plan, manage, monitor & co-ordinate health & safety during the construction phase of the project, as defined in the CDM: Regs 2015Regulations
8. "Principal Designer" shall mean the Designer appointed by the Client to plan, manage, monitor & co-ordinate health & safety during the pre-construction phase of the project, as defined in the CDM: Regs 2015Regulations

25 Definitions - procedures, etc

1. The definitions used in this Document are as follows:
2. "Approved" or "approval" shall mean approved by or approval of the: CA/Landscape Architect
3. "Submitted" or "submit" shall mean submitted to or submit to the: CA/Landscape Architectin writing
4. "Accepted" or acceptance shall mean accepted by or acceptance of the: CA/Landscape Architectin writing
5. "Inspected" or "inspection" shall mean inspected by or inspection of the: CA/Landscape Architect
6. "Directed" shall mean directed by the: CA/Landscape Architectin writing
7. "Authorised"/"Authority" shall mean authorised by/authority of the: CA/Landscape Architectin writing
8. "Required" shall mean "required" by the: CA/Landscape Architectin writing
9. "Rejected" shall mean "rejected" in writing by the: CA/Landscape Architect

30 Drawings

1. The Contract drawings shall form part of the quotation. The Contractor is to be satisfied that the information contained in the drawings is sufficient and correct for the works to be carried out, as no variations arising from lack of information will be accepted.

40 Contractor / subcontractor

1. The works shall be carried out by properly qualified and experienced personnel, expert in the aspect of work in which they are engaged.: CA/Landscape Architect, and they will need to demonstrate their suitability through examples of their relevant completed projects and CVs of key personnel.

50 Works programme

1. Before commencing the works, the Contractor shall provide to, and and agree with, the: CA/Landscape Architecta detailed programme showing the Contractor's proposed sequence and timing of operations. The Contractor must review and update all the programmes from time to time as may be necessary.

60 Rates

1. Unless otherwise specifically stated, the rates quoted by the Contractor shall be deemed to include for labour and all costs in connection therewith, materials including conveyance, delivery, unloading and handling, establishment charges, waste, overhead charges and profit.

70 Schedule of rates - alterations and qualifications

1. No alterations or qualification of any kind whatsoever are to be made by the Tenderer to the text of the Schedule of Rates. If any alteration or qualification is made by the Tenderer (other than alteration or qualifications notified by the CA during the period of Tendering) it will be ignored and the text, as prepared by the CA, will be rigidly adhered to.

80 Contractor design items

1. This is a detailed specification describing the Contract Works, which, together with the Contract Drawings and the other conditions given in this document and those compiled by the CA, will form the Contract.
2. In some cases performance criteria for a particular material, design or type of construction may be implied by the Contract Drawings. In such cases the Tenderer is required to provide detail specifications that will satisfy the performance required.
3. The Contractor will be responsible for all supervision necessary to ensure that the Contract Works are carried out in strict accordance with the detail specification.

4. The Tender quotation shall be qualified in writing if there are any items in the specification with which the Tenderer wishes to take exception or with which the Tenderer cannot comply.
5. The Contractor will be responsible for the adequacy and design of any detail specification provided by the Contractor in response to performance criteria provided by the Designers.
6. Reference to British Standards, and British Standard Codes of Practice, shall mean the latest edition thereof, together with any amendments current 10 (ten) days before the date of Tender.
7. One copy of any preliminary drawings necessary to illustrate proposals must be submitted with the Contractor's Tender.
8. The method of construction must be consistent with good and proven practice and shall be in accordance with applicable BS/CP recommended procedures.
9. The method of construction must allow for prefabrication and/or other forms of off-site manufacture as necessary to suit the nature of the Contract Works and the incomplete state or otherwise of the project at the time of construction.

90 Stability

1. The construction of the structures and fixtures shall be such that they remain rigid and free from undue play and/or measurable permanent deformation caused by their self weight, wind load and/or the normal use to which they will be subjected.

100 Supervision for quality

1. Supervision of the works shall be the responsibility of the Contractor. The Contractor shall appoint full time supervisors both on and off the site who shall instruct the Contractor's personnel and properly represent the Contractor in all matters related to progress, the technical specification for the Works and quality of materials and workmanship.
2. Before any work starts the Contractor shall notify the CA in writing of the names of the appointed supervisors. No work of the Contractor shall be carried out unless one of the appointed supervisors is present at the place where the work is physically being executed.

110 Working areas

1. The Contractor shall be satisfied and aware by inspection of site drawings and programmes and by site visits of the areas available to commence work, especially with regard to access and haul roads and concurrent works by others.

120 Weather / soil conditions

1. The works shall be carried out during suitable weather and soil conditions. Earthworks and topsoil placement must be carried out under dry conditions when soil moisture is as low as possible, e.g. no visible standing water. The: CA/Landscape Architectmay, at any time, suspend any part of the works until soil moisture levels improve.

130 Joint inspections

1. The Contract Manager and Landscape Contractor shall jointly agree the condition of all works completed by others prior to the Contractor commencing works in any area.

140 Alternative material, design or type of implementation

1. Where a particular material, design or type of implementation is specified, or implied by Contract drawings and the Contractor is not sure that the preference specified will satisfy the requirements of the Contract documents, then alternative proposals are to be made when submitting prices.

150 Approval of the works

1. Throughout the Contract it will be necessary for the CA to inspect or give approval or agreement to the Contractor's proposals, working drawings, material samples, analyses, Contract Works as

executed, etc. Such approval or agreement shall in no way imply or be construed as a relief or abatement of the Contractor's responsibility and liability for performance under this Contract.

2. Where any document, drawings, working method, soil condition, sample etc., is required by the Contract to be inspected or approved by, or be to the agreement or satisfaction of, the CA, then the Contractor shall not proceed until he has verbal confirmation to do so.

160 Excluded work

1. The Contractor's Tender shall clearly describe any work necessary for the proper execution of the Contract which has not been included for in the Tender Return. Any such work not specifically stated and described in detail shall be deemed to have been included for in the Tender.

170 Ordering of materials

1. Quantities or dimensions for ordering materials are to be taken from the drawings. The Contractor must first check the dimensions and details of such drawings and should also check and verify the dimensions of the drawings against the relevant site dimensions before taking quantities and before ordering materials.: No claims resulting from neglect of these requirements will be entertained.

180 Suppliers

1. Within two weeks of being appointed, the Contractor shall submit a list to the: CA/Landscape Architectof manufacturers, suppliers and sources of supply from whom it is intended to purchase materials necessary for the execution of the works.

190 Labour

1. All personnel employed on site by the Contractor shall be competent and experienced in all aspects of work on which they are engaged.

200 Importation of labour

1. The Contractor shall allow for all or any costs arising from the importation of competent and experienced labour from any source.

210 Sub-letting

1. The Contractor shall not sub let any portion of the works without the written consent of the: CA/Landscape Architect

Ω End of Section

A15
Materials and workmanship

Clauses

10 Generally

1. All plants, materials and workmanship shall be the best of their kind, and comply with the specification.
2. The Contractor shall provide everything necessary for the proper execution of the works, including all transport, plant, tackle, machinery, materials and labour.
3. The type of lorries, trucks, machinery (including tractors) to be used in the operations are to be approved by the: CA/Landscape Architect. These are to be kept to such paths and routes within the site as will be agreed with the CA/Landscape Architect.

20 Defects, shrinkages and other faults

1. The Contractor will be required to make good all defects, shrinkages or other faults of any nature arising in the execution of the works through fault or negligence, or from unacceptable standards of quality in workmanship or materials. Making good will be carried out at the Contractor's expense, at no additional cost to the Contract.

30 Temporary works

1. The Contractor shall provide and be fully responsible for all temporary works, including their design, and the adequacy of their construction for the purpose intended.
2. The Contractor shall prepare and submit, in ample time for checking prior to the execution of the works, detail drawings of any temporary works that the Contractor may wish to use. This shall not relieve the Contractor of responsibilities in any way.
3. All temporary works are to be removed on completion and all necessary repairs and reinstatement carried out.

40 Site cleanliness

1. The Contractor shall during the course of carrying out works ensure all necessary measures are taken so that the approach roads, site roads, footpaths and other pavings are kept free from obstruction, dirt, mud, debris, litter and fallen leaves.
2. Throughout the works the site shall be kept in a clean orderly condition at all times. Paving shall be cleaned and rubbish removed from site on a daily basis.

50 Nuisance

1. The Contractor shall avoid nuisance to neighbouring owners and occupiers by keeping the amount of noise to a minimum and confining it to reasonable hours.

60 Existing and proposed services

1. The Contractor shall allow for upholding and protecting all pipes, ducts, sewers, services, mains, overhead cables etc. and shall ensure that any damage caused by carrying out the works will be made good at the Contractors expense.
2. Notwithstanding any information contained within the Contract documents regarding the position of existing services etc., it shall be the responsibility of the Contractor to be satisfied as to the accuracy of their location and condition: .

70 Existing drainage

1. The Contractor must ensure that for the duration of the Contract all existing drains and gullies are kept clear of obstruction and that service covers are not damaged or buried under soil.

80 Survey

1. Existing levels shown on the drawings are indicative only and the Contractor shall include for carrying out any survey work that is considered necessary to determine the conditions on site and the amount of material to be moved.

90 Site and topsoil conditions

1. The Contractor will be deemed to have visited and be satisfied with the site and to have carried out any ground investigations that may be necessary and to the existing ground conditions, including the amount of top soil available at the site for landscape works.

100 Notice of intentions

1. The Contractor shall give 72 (seventy two) hours notice to the CA of the intention to commence any of the following works:
    1.1. Setting out – both hard and softworks
    1.2. Approval of subsoil formation prior to topsoiling
    1.3. Topsoiling prior to amelioration
    1.4. Topsoil amelioration
    1.5. Seeding and turfing
    1.6. Selection of plant stock
    1.7. Delivery of plant stock
    1.8. Planting works including setting out
    1.9. Samples of hard paving works, walls and edges
    1.10. Maintenance visits
2. Failure to give the appropriate notice may invalidate work done and the Contractor may be required to carry out the operations again.

110 Season

1. All work shall be carried out at an appropriate season and in weather conditions suitable for the operation. In particular, tree and shrub planting shall not be carried out before October or after March, and grass seeding shall be carried out between the months of March to May or mid August to mid October (inclusive), unless specifically approved by the CA.

120 Setting out

1. The lines and levels of the proposed works shall be set out by the Contractor by soft wooden pegs or steel pins in accordance with the Contract drawings and by site directions given by the CA.
2. Approval shall be sought from the CA of the setting out prior to commencing any section of work, and the Contractor shall allow for final adjustments to setting out as directed on site by the CA/Landscape Architect.

130 Temporary setting out

1. The Contractor is to allow for temporary setting out of all shrubs, plants, trees, etc., and repositioning them as necessary, to the entire satisfaction of the CA/Landscape Architect.

140 Disposal of water

1. The works shall be maintained free of water. All surfaces of excavations and fill shall be formed to provide adequate drainage falls at all times. Temporary drains, sumps and pumping shall be provided by the Contractor as necessary.

150 Protection of the works

1. The Contractor shall anticipate the possible sources of damage to these works, and to those of others, and shall take active and positive protective measures to the satisfaction of the: CA/Landscape Architect
2. The acceptance of responsibility for making good in the event of damage will not be adequate
3. Protective devices shall protect the works against damage arising from weather conditions, construction, other Contractors, warping, distortion, abrasion, sunlight, humidity or other conditions that could have an adverse effect on the works
4. Within the detailed specification to be submitted with the Tender, the Contractor shall provide full details of the proposed protective measures to be implemented in order to comply with the requirements set out in Clauses: **A15/151**, **A15/152** & **A15/153** below.

151 Protection of the works - stage 1: before work on site/transportation

1. The Contractor shall provide devices to protect the works during loading, transportation to and unloading at the site.
2. Protective devices shall be arranged so that wherever possible they can be maintained in position during storage, assembly and fixing and until the works have been completed.
3. Where components are delivered to the site in packages or crates, then each package or crate shall be labelled on the outside giving the reference and quantity of the contents so that deliveries can be accepted at the site without the necessity of breaking open each package.

152 Protection of the works - stage 2: during works on site

1. The Contractor shall provide, maintain, alter and adapt protective devices as necessary to protect the works during construction, assembly and/or installation up to the time when they have been completed.
2. The Contractor's Tender shall include for, and take positive protective measures to ensure that, any possible damage to the work of others by reason of the works is prevented.
3. The Contractor shall allow for removing all protective devices and thoroughly cleaning down before the works are presented for final acceptance.

153 Protection of the works - stage 3: after completion of the works

1. The Contractor shall supervise, check and maintain the protective devices as necessary until Practical Completion.
2. The Contractor shall allow for returning to the site as necessary upon Practical Completion to remove protective devices and for thoroughly cleaning down before the building/external works is handed over.

160 Methods of fixing

1. The Contractor shall make all preparations and drilling required to produce firm secure fixings. The: CA/Landscape Architect, shall inspect and approve all proposed methods of fixing, such approval shall in no way relieve the Contractor of the obligation to replace any fixings which fail for whatever reason other than vandalism or inadequate maintenance by others.

170 Reinstatement

1. Should any damage or loss be caused to any existing or completed works due to, or arising from, the performance of the Contract, then the Contractor will be required to reinstate and make good such damage or loss at the Contractor's expense and to the satisfaction of the: CA/Landscape Architect
2. Wherever ground is temporarily disturbed by the Contractor during the course of Contract operations, it shall be restored by the Contractor to its original state and form, or to such other appropriate state or form as shall be approved by the: CA/Landscape Architect

3. Stacking of materials on site will only be allowed with the prior approval of the: CA. Tracking over finished areas will not be permitted and the Contractor shall allow for protecting grass and planting areas as necessary.
4. Any soil that becomes unsuitable due to contamination, loss of structure, or for any other reasons during site operations, shall be reinstated as specified, or as otherwise directed, at the Contractor's expense.

180 Weeds

1. The Contractor will be responsible for keeping the site free of weeds for the duration of this Contract.
2. Weed clearance shall be by hand or approved mechanical means only and the Contractor's rates shall allow for this.
3. Chemicals may only be used with the approval of the: CA/Landscape Architect
4. All arisings shall be removed from site to an approved tip.

190 Chemicals - general

1. Chemical weed killers must comply with all relevant regulations and be included on the current Chemical Regulation Directorate's (CRD) Pesticides Register Database.
2. The weed killer must not be toxic to humans, birds or animals under normal use and the Contractor must obtain the approval of the: CAfor the chemical intended to be used.

200 Herbicide application

1. Herbicide application shall only be carried out by persons legally qualified to do so. The Contractor shall submit evidence of such qualifications to the: CAprior to the application of any herbicide.
2. The Contractor shall not carry out spraying operations during unsuitable conditions, e.g. during rainfall, or when extensive rainfall is forecast, or during windy weather, etc., that may cause spray to drift onto adjoining land. The Contractor will be held responsible for any damage or injury to persons or property resulting from this operation and must indemnify the Client against all claims for damage.
3. Spraying or spreading equipment shall be of an approved design and suitable for the type of terrain. Knapsack sprayers and other forms of portable equipment shall be used on banks and areas with difficult access. All spray equipment shall be fitted with a guard to prevent spray reaching nearby trees and shrubs. Any trees or shrubs damaged by chemicals shall be replaced at the Contractor's expense.
4. **All relevant Acts of Parliament and the manufacturer's instructions concerning the handling, use and storage of chemicals shall be followed. Containers and other contaminated equipment shall be cleared from site after each day's work.**

210 Tolerances - general

1. The method of construction shall accommodate tolerances and allow for differences between actual site dimensions and dimensions on the Contract drawings. No additional payment will be allowed for any inaccuracies on the Contract drawings unless such inaccuracies are specifically highlighted in the Tender Return.
2. Due to the nature of the works, the Contractor shall allow for adjustments to setting out as directed on site by the: Landscape Architect

220 Water for the works

1. The Contractor is responsible for the provision of clean fresh water up to Practical Completion.

230 Samples

1. Where specified, the Contractor is to make provision for supplying samples of materials, articles etc. proposed to be used for the works. These samples are to give a fair indication of the quality of

the bulk intended to be used. The samples must be provided in sufficient time for the: CAto make a decision, and the Contractor shall not obtain materials in bulk until such approval is forthcoming. Neither is the Contractor to continue with aspects of work on site if they have not had their associated sample panels approved. No claims from delay in this respect will be entertained.

231 Samples required

1. The following is a list of samples that are required for approval before proceeding with the associated works on site. Reference should be made to their specific clauses for details of the samples required. This list is not exhaustive, and reference should be made to the full Landscape Specification for details of all sample requirements.
2. **Element**: **Clause**: **Sample Type**:
3. For the purpose of Tender, the Contractor should assume samples of hard landscape finishes including walls, fences and handrails plus representative samples of mulches, soils (to Q28) and gravels are required. Refer also to Section Q31 for plant procurement.
4. MU: = Mock-up (Generally for viewing at the fabricator's workshop)
5. SP2: = Sample Panel (on site) - as part of the final works, once approved
6. NB: SP2 sample panels that are **rejected** must be **removed** from, and not form part of, the finished works.

232 Testing, analysis & certification requirements

1. The following is a list of testing, analysis & certification requirements for landscape works and elements. Reference should be made to their specific clauses for further details. This list is not exhaustive, and reference should be made to the full Landscape Specification for details of all testing/analysis/certification requirements.
2. **Element**: **Clause**:
3. Frost susceptibility D20/520
4. Fill D20/616

234 Fabrication drawing requirements

1. The following is a list of fabrication drawings that are required to be provided by the Contractor for approval before proceeding with the associated works on site. Reference should be made to their specific clauses and relevant drawings for further details. This list is not exhaustive, and reference should be made to the full Landscape Specification for details of all fabrication drawing requirements.
2. **Element**: **Clause**: **Drawing No.**:
3. For the purpose of this Tender the Contractor should allow for fabrication drawings of all elements requiring on or off site fabrication e.g. metalwork components including handrails, planters, barriers and rails.

237 Requirements for information to be submitted

1. The following is a list of information that is required to be provided by the Contractor for approval before proceeding with the associated works on site. Reference should be made to their specific clauses for further details. This list is not exhaustive, and reference should be made to the full Landscape Specification for details of all testing/analysis/certification requirements.
2. **Element**: **Clause**:
3. Contractor Environmental Policy D02/10
4. Landscape Works Program A14/50
5. Contractor Design Items A14/80
6. Supervision A14/100
7. Supplier List A14/180
8. Temporary Works A15/30

9. Protection of the Works A15/150
10. Herbicide Application A15/200
11. Proposed Fill Materials D20/500

239 Requirements for

1. Description: ca/landscape architectapproval
2. The following is a list of items that require approval by the: CA/Landscape Architectbefore proceeding with the associated works on site. Reference should be made to their specific clauses for further details. This list is not exhaustive, and reference should be made to the full Landscape Specification for details of all testing/analysis/certification requirements.
3. **Element**: **Clause**:
4. Setting Out A15/120
5. Formation Operations D20/798

240 Provision of tip

1. The Contractor shall cart all demolitions, stones, rubbish and the like to an approved tipping location. The Contractor shall agree with the: CAany materials that are to remain on site and not be carted away.

250 Site cleanliness

1. The Contractor shall maintain the works free from all rubbish at all times, including all timber off-cuts, metal, brick and/or stones over 100mm in any direction, and broken glass, etc..

260 Failure of plants (pre-practical completion)

1. Any trees, shrubs, grass or other plants, including those found to be missing or defective as a result of theft or malicious damage, shall be replaced immediately by the Contractor at their expense, unless instructed by the: CA

270 Failure of plants - defects liability period (post practical completion)

1. The duration of the Defects Liability Period for hard and soft landscape elements included within these works is as follows:
    1.1. 12 months following the certified date of Practical Completion: Hard and Softworks generally
    1.2. 24 months following the certified date of Practical Completion: Semi-mature nursery stock
2. The maintenance of all hard and soft landscape elements included within these works shall be carried out for the time periods stated above, running concurrently with the Defects Liability Period.
3. Any grass, trees, shrubs, herbaceous plants, aquatics or bulbs, etc., found to be defective within the time periods stated above shall be replaced by the Contractor, at their expense and at no additional cost to the Contract, unless otherwise instructed by the: CA
4. Note: 24month Defects Liability Period.

280 Practical completion

1. At Practical Completion the Contractor is to leave the works complete and in compliance with the Contract documents, and the site neat & tidy and weed-free to the satisfaction of the: CA/Landscape Architect
2. All plants shall be healthy and in pristine condition.
3. Grass areas will only be accepted when germination has proved satisfactory and all weeds have been removed. Damage, failure or dying-back of grass due to neglect of watering shall be the responsibility of the Contractor. No payment for reseeding or turfing shall be made to the Contractor if the seed or turf fails due to any cause whatsoever. Soiling shall be made good and the seeding or turfing repeated until a good sward is obtained, by the Contractor at their expense.

4. Any shrinkages (within hard and soft landscape areas) below the specified levels during the Contract Period and ensuing Defects Liability Period shall be rectified at the Contractor's expense.

290 Protected areas and hand works

1. Existing trees to be retained - All operations within the zone of tree protection shall be executed by hand works only and this must be allowed for in the Contractor's Tender rates.
2. All other operations outside the protected zones may be carried out by suitable approved machines or by hand.
3. Any works in confined spaces, or impracticable to carry out by machine for any reason, e.g. steep gradient, shall be executed by hand and this must be allowed for in the Contractor's Tender rates.

300 Holding area for plant stock

1. Plant deliveries shall be arranged to minimise, or avoid, the storage of plant material on site. If plant storage is necessary, then the Contractor shall be responsible for preparing a holding area which complies with The Committee for Plant Supply & Establishment's Booklet: CA, the size and detailed nature of this area in terms of security, etc., and in accordance with the Contractor's programme.

310A Method statements

1. The Contractor's Tender shall include an outline method statement defining how the requirements of this document will be satisfied. In particular, the method statement shall address the following:
    1.1. Key personnel and qualification(s)
    1.2. Work policy statement & staff organisation
    1.3. Procurement, e.g. sources & suppliers of materials
    1.4. Site offices, nursery compound & storage
    1.5. Establishment
    1.6. Protection of works
    1.7. Setting out of works
    1.8. Laying of concrete slabs and pavers
    1.9. Brick clad walls
    1.10. Work to the subsoil
    1.11. Topsoil supply & spreading
    1.12. Planting works
    1.13. Support for excavations & setting out
    1.14. Works within the RPZ or with potential impact on the existing trees to be retained:
2. On being appointed, the Contractor shall submit (within 2 weeks) a detailed Method Statement, specification and drawings that fully address all the above items.

320 Tests

1. The: CAmay require the Contractor to engage testing specialists in order to prove that the requirements of this Contract have been satisfied.
2. The Contractor shall allow for testing to the: CA'ssatisfaction, both on samples and on the Contract Works, which may include the following:
3. Tests on Samples:
    3.1. The Contractor shall allow for such tests as may be necessary to prove that the samples satisfy the requirements of this document.
4. Tests on Contract Works:
    4.1. If the: CA/Landscape Architect is of the opinion that the Contract Works do not conform to the requirements of this document, or to the details indicated on the working drawings, then

the CA/Landscape Architectwill give instructions for special tests to be carried out to establish the case.

4.2. Should a test show that the Contract Works are satisfactory, then the cost of such a test will be added to the Contract sum.

4.3. Should a test show that the Contract Works are not satisfactory, then the cost of such testing will be at the Contractor's expense. Any works shown to be unsatisfactory shall be removed or replaced or otherwise made good to the: CA's/Landscape Architect'ssatisfaction and at the Contractor's expense.

330 Maintenance manual

1. A maintenance manual shall be prepared by the Contractor which shall give details of all work required to maintain the works or any component, fitting or accessory in proper working order consistent with the performance and other requirements of this Contract, and which must clearly state the following:
   1.1. Method statement
   1.2. Any sequence of work related to maintenance
   1.3. Identification of parts requiring maintenance giving reference to location of the item on record drawings together with manufacturers' references numbers, addresses and telephone numbers of firms from whom materials or parts can be obtained.
2. The works shall not be accepted as completed until 3 (three) copies of the maintenance manual have been submitted to the: CA's satisfaction.

340 Record as-built drawings

1. The Contractor shall allow within the tender for the preparation of digital, detailed, full and accurately dimensioned record/as built drawings showing the works as finally supplied and installed e.g. planting plans, finished earthworks levels and general arrangement levels plan.
2. The Contractor shall provide one paper copy and three CDs of the finally approved record/as built drawings suitable for copying by the: CA/Landscape Architect
3. The works shall not be accepted as complete until agreed and suitable copies of the record drawings have been submitted.

350 Inspections / approvals / requirements

1. Where any document, drawing, sample etc., is required by this Contract to be inspected or approved by, or be to the agreement, satisfaction or requirements and the like of, the: CA , then the Contractor shall not proceed until a copy of such document, drawing, sample, etc., bearing the CA’s stamp has been received.
2. The Contractor shall ensure that the works are carried out in strict accordance with the latest stamped inspected issue of any such document, drawing, sample etc.
3. No inspection, approval, agreement, satisfaction or requirements and the like of the: CAshall in any way imply, or be construed as relieving, the Contractor's responsibility for performance, dimensions and/or other responsibilities described in this Contract or otherwise at Law.
4. Where the: Landscape Architect'sis required to affix an inspection stamp to the Contractor's detailed specification, drawings, manuals, samples and the like, no such inspection or stamp shall in any way imply or be construed as relieving the Contractor’s responsibility for performance, dimensions and/or other responsibilities described in this Contract or otherwise at Law.
5. Where the Contract requires that the: CA/Landscape Architectshall witness a test and the like, the Contractor shall give 7 (seven) days written notice of when attendance is required at the site or workshops for that purpose.
6. No alteration to the performance or other requirements of this specification shall be made unless a variation instruction is issued by the: CA

Ω End of Section

D20
Excavating and filling

Clauses - Not Used

To be read with preliminaries/general conditions

4 Section index

5 General

1. To be read in conjunction with the Engineer's Specification.

10 Reference documents

1. BS1377-1:2016: *Methods of test for soils for civil engineering purposes. General requirements & sample preparation.*
2. BS1377-2:1990: *Methods for test for civil engineering purposes. Classification test.*
3. BS3882:2015: *Specification for topsoil*
4. BS3998:2010: *Tree Work - Recommendations*
5. BS8601:2013: *Specification for subsoil and requirements for use*
6. BS4428:1989: *Code of practice for general landscape operations (excluding hard surfaces)*
7. BS5837:2012: *Trees in relation to design, demolition & construction - recommendations*
8. BS5930:2015: *Code of practice for ground investigations*
9. BS6031:2009: *Code of practice for earthworks*
10. BS8000-0:2014: *Workmanship on construction sites. Introduction & general principles.*
11. BS8000-1:1989: *Workmanship on building sites. Code of practice for excavating and filling.*
12. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites: , DEFRA

20 Topsoil definition

1. Top layer of soil, darker in colour and with more organic matter than the layer below (subsoil), or manufactured soil with similar properties.

30 Subsoil definition

1. Soil layer extending between the topsoil and the little weathered parent material below, or material that functions in the same way in a constructed soil profile and on to which topsoil can be spread.
2. Note: Subsoil usually has a lower concentration of organic matter and available plant nutrients than topsoil.

40 Groundworks responsibilities

1. It is assumed that the site clearance/excavation works will be carried out: by the Main Contractor
2. It is assumed that the formation levels/bulk subsoil placement will be carried out: Main Contractor
3. It is assumed that the fine grading works, including ripping in preparation to receive topsoil, will be carried out: Landscape Contractor . The Landscape Contractor's rates shall include for fine grading and adjustment to the formation levels so that the specified finished levels are accurately achieved using the prescribed topsoil depths. Refer also to Clause **D20/790** .
4. It is assumed that the topsoil placement, preparation and amelioration works, as set out in Clause: Landscape Contractor
5. The Main Contractor is to submit proposed Contractor responsibilities for the groundworks packages noted above to: CA for approval at Tender Stage

50 Handling & use of soils on construction sites

1. A soil's physical structure can easily be damaged during handling and is therefore susceptible to compaction.
2. All soil handling & placement operations to be in accordance with DEFRA's: *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*
3. All soil handling & placement operations to be in accordance with all relevant British Standards, as noted above.

Generally/the site - Not Used

Existing site & site investigations

110 Site investigation

1. Report: Refer to CA

115B Site soil analysis

1. A full analysis of subsoil(s) & topsoil(s) present on site will be required in order to establish their suitability for reuse within the scheme.
2. Topsoil: Refer to Clause: **Q28/280**of this specification for further details/requirements.
3. Subsoil: Refer to Clause: **Q28/285**of this specification for further details/requirements.

145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

155 Existing site features

1. Verify with: CAwhich existing fences, gates, walls, roads, paved areas, and other site features are to be removed or protected. Materials arising, surplus to requirements for filling or reuse, are to be removed from site to an approved tip.

Existing trees & vegetation

161 Existing trees to be removed

1. Verify with CA/Landscape Architect: which trees, shrubs and hedges are to be removed.
2. Mark trees for felling with a paint mark.
3. Cut down, grub up main roots and fill voids with approved material. Dispose of all wood in accordance with this specification.
4. The Contractor shall undertake the removal of existing vegetation as follows:
    4.1. Any existing trees and hedgerows to be removed shall be agreed between the Contractor and the: prior to their removal.
    4.2. Check for below and above ground services in the vicinity. Inform: if they may be affected and obtain instructions before proceeding.
    4.3. Removal of trees shall be undertaken by a qualified and approved Arboriculturalist – details to be submitted to the: for approval.
    4.4. Works adjacent to the Public Highway or path used by the public shall be carried out in accordance with all current relevant Health & Safety Legislation.
    4.5. Works shall comply with Forestry and Arboriculture Safety and Training Council Safety Guides.
5. The removal of trees and hedgerows shall include all growth above ground level and below ground roots.
    5.1. Any voids left by the removal of stumps or roots shall be filled with appropriate material to the satisfaction of: before removal off site by the Contractor.
    5.2. All roots and vegetation not constituting timber, or to be disposed of in accordance with: **D20/190**, shall be taken off site to an approved licensed tip.
6. All tree & vegetation removal must comply with: *The Dutch Elm Disease (Restriction of Movement of Elms) Order* and subsequent amendments.
7. The Contractor is to submit a Method Statement for all tree works for: CA/Landscape Architect and Arboriculturalist's approval prior to construction work commencing.

Clearance/excavating

162 Protection of vegetation retained

1. Several existing trees: are to be retained and all are considered important to the setting of the site and local visual amenity. The Contractor may be liable for any damage to the trees which may result in prosecution from London Borough of Camden
2. Note the importance and legal status of existing trees on the site and be familiar with all relevant survey information and the tree protection measures.
3. All trees, shrubs and hedgerows indicated to remain within or adjacent to the extent of the site (as identified on the Tree Protection Plan) shall be protected during the course of the works in accordance with the Arboricultural Consultant's requirements and in accordance with BS 5837:2012: *Trees in Relation to Design, Demolition & Construction - Recommendations*.
4. Temporary protective fencing in accordance with BS 5837 is to be erected in accordance with the Arboricultural Consultant's requirements. The exact location of the fence(s) shall be agreed on site by the: and Arboricultural Consultant prior to works commencing.
5. No change to the ground level shall be made within areas protected by temporary protective fencing unless instructed by the: /Arboricultural Consultant
6. Ensure that no materials of any kind are stored within areas protected by temporary protective fencing and that access is limited to that required for maintenance purposes only
7. Take care when carrying out earthworks in the proximity of existing trees to be retained to avoid potential damage to the trees through flooding, changes to ground water levels, damage to roots and pollution of the ground

8. Protected Area - defined as the largest of:
    8.1. The branch spread of the tree
    8.2. An area with a radius of half the tree's height, measured from the trunk
    8.3. The Root Protection Zone as defined:
9. Do not cut roots within a Protected Area
10. Excavation in a Protected Area:
    10.1. Method:
    10.2. Backfill as soon as possible or temporarily line with polyethylene sheet to reduce evaporation.
11. Cutting exposed/damaged roots:
    11.1. Do not cut roots within a Protected Area without approval by:
    11.2. Make clean smooth oblique cuts, with no ragged edges, to good arboricultural practice
    11.3. Pare cut surfaces smooth with a sharp knife
    11.4. Treatment of cut roots:
    11.5. Keep exposed roots moist (by covering with damp Hessian sacking) until covered by new construction works
12. Outside Protected Area(s): Give notice of roots exceeding 25mm and do not cut without approval
13. Backfill:

163 Special tree protection measures

1. Certain trees require special protection measures during the construction of adjacent walls, surfaces and edges. These are identified within the Arboricultural Impact Assessment (AIA): and works in the vicinity of affected trees should comply with the following
2. **Construction of Roadways/ Paths/ Kerbs Above Existing Tree Roots**
3. Submit a Method Statement for all works within the tree protection zones
4. Allow for carrying out all works within the tree protection zone by hand
5. Carefully remove existing surface layers and features to reveal depth and positions of principal roots in excess of 40mm Ø. All roots above 40mm Ø shall be retained and adequately protected from damage.
6. Excavate to required formation level between protected roots ensuring that smaller roots are clean cut at end closest to tree trunk.
7. Form clean smooth cuts with a hand saw, minimising the wound area and avoiding ragged edges.
8. Place load bearing geotextile mat to Engineer’s Specification.
9. Carefully backfill between roots with approved sub base material avoiding damage to protected roots.
10. **New Walls/ Earthworks Cutting into Existing Tree Root Zones**
11. Where proposed walls or earthworks cut into ground around existing tree take necessary measures to minimise impact on existing roots
12. Notify the: CA/Landscape Architect if roots exceeding 40mm Ø are exposed by excavations
13. Do not cut roots in the protected area without approval of the: CA/Landscape Architect
14. Extent of excavations shall be limited to the absolute minimum necessary to achieve construction of new features and shall be subject to approval by the: CA/Landscape Architect prior to excavation works commencing
15. All roots damaged by excavation shall be given a clean oblique cut with a handsaw to good arboricultural practice and roots shall be kept moist (by covering with damp Hessian sacking) until covered by new construction works

16. Non structural backfill within future soft landscape zones shall consist of 2 parts site topsoil, 2 parts clean horticultural sand, 1 part approved soil ameliorant, e.g. Approved commercial planting compost (peat free)

164 Tree roots

1. Protected area: Do not cut roots within precautionary protection area.
    1.1. Size of area:
2. Excavation in protected area
    2.1. Method:
    2.2. Backfill as soon as possible or temporarily line with polyethylene sheet to reduce evaporation.
3. Outside protected area: Give notice of roots exceeding 25 mm and do not cut without approval.
4. Cutting
    4.1. Make clean smooth cuts with no ragged edges.
    4.2. Pare cut surfaces smooth with a sharp knife.
    4.3. Treatment of cut roots:
5. Backfill:

165 Damage to existing vegetation to be retained

1. In the event of the Contractor damaging any trees, shrubs, hedgerows and/or grass areas that are to be retained outside and/or within the Contract Working Area, remedial works shall be carried out by and at the Contractor's expense.
2. The Contractor may be liable for any damage to the trees which may result in prosecution from:
3. Mature Trees: In the event of damage to trunks, branches or roots, the Contractor shall:
    3.1. If the damage is sufficiently limited, undertake all necessary surgery works by an approved Arboriculturalist; or
    3.2. If the damage will significantly reduce the tree's viability or life expectancy, replace with new semi-mature tree(s) and include all associated soil amelioration, guying and protective fencing as required by the: following inspection of the type and nature of the tree
4. Mature Trees: In the event of compaction of the rooting area, which may precipitate the tree's death, the Contractor shall:
    4.1. Replace with new semi-mature tree(s) and include all associated soil amelioration, guying and protective fencing, as required by: LBC Tree Officer/Landscape Architect following inspection of the type and nature of the tree.
5. Young Trees, Scrub and Shrubs, and Hedgebanks: : In the event of damage to the stems or branches, the Contractor shall:
    5.1. If the damage is sufficiently limited, undertake all necessary remedial pruning and other surgery works; or
    5.2. If the damage is such that the plants will not recover, as identified by: LBC Tree Officer/Landscape Architect, replace with plants of comparable size and species and protect with temporary protective fencing or other fencing for the establishment period including all soil preparation, amelioration, protection and other items as described in the specification.
6. Grass Areas: In the event of damage to existing grass areas, the Contractor shall:
    6.1. Fully reinstate all damaged areas in accordance with this specification and as described by: following inspection, including subsoil decompaction, topsoil depths, and seeding and turfing as appropriate. Seed mix or type of turf shall be instructed by

167 Tree works - quality of works

1. In accordance with good current practice & shall conform to BS3998:2010: *Tree Work - Recommendations* and BS5837:2012 *Trees in Relation to Design, Demolition & Construction -*

Recommendations. The standard of workmanship must be to the best possible standard capable from being produced by high calibre, highly experienced work people. All tree works to be carried out by a certified Arboriculturalist to the CA's approval.

170 Removing small trees, shrubs, hedges and roots

1. Identification: Clearly mark trees to be removed.
2. Small trees, shrubs and hedges: Cut down
3. Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas
4. Safety: Comply with HSE/ Arboriculture and Forestry Advisory Group safety leaflets.

175 Felling large trees

1. Definition: Girth over 600 mm.
2. Identification: Clearly mark trees to be removed.
3. Safety: Comply with HSE/ Arboriculture and Forestry Advisory Group safety leaflets.
4. Felling: As close to the ground as possible.
5. Stumps:
6. Work near retained trees: Take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained, where tree canopies overlap and in confined spaces generally.

180 Chipping and shredding

1. General: Permitted, remove arisings from site.

190 Disposal of vegetative arising

1. Selected suitable arisings resulting from the works shall be sawn to varying log sizes (circa 500-1500mm lengths & min 80mm Ø) & stored to provide an ecological habitat i.e. log piles. The location and number of these piles will be determined on site by the: CA
2. The Contractor shall allow for carting to tip any unsuitable arisings (those which can not be recycled as above).
3. Comply with: *The Dutch Elm Disease (Restriction on Movement of Elms) Order*, and subsequent amendments.

220 Stripping topsoil

1. General: Refer to Clauses D20/400 - 429 for requirements

240 Adjacent excavations

1. Requirement: EXCAVATIONS • Requirement: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto, must be completed before the higher excavation is made.
2. Angle of line below horizontal: To Engineer's Requirements.
3. Backfill material: To Engineer's Requirements.

242 Excavations adjacent to existing backfilled trenches

1. Proximity: When width of undisturbed ground between the two excavations will be less than To Engineer's Requirements.
2. Action: Assume that the ground between the trenches is unstable and provide side support accordingly.

244 Excavations adjacent to existing foundations

1. Prior to commencing excavation
   1.1. Excavate trial pits adjacent to existing foundations to determine extent and formation levels.
   1.2. Allow for inspection of trial pits.
   1.3. Allow time for amendment of details if required.
      1.3.1. Time period: To Engineer's Requirements
2. Backfill material to new excavation: To Engineer's Requirements

267 Inspection of formations in shrinkable soils

1. Inspect formation: For signs of conducting and fine moisture absorbing roots.
2. Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

270 Foundations generally

1. Give notice if
   1.1. A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
   1.2. The formation contains soft or hard spots or highly variable material.

290 Foundations in made up ground

1. Depth: Excavate down to a natural formation of undisturbed subsoil.
2. Discrepancy: Give notice if this is greater or less than depth given.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

320 Recorded features

1. Recorded foundations, beds, drains, manholes, etc.: To Engineer's Requirements
2. Contaminated earth: Remove and disinfect as required by local authority.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

Site clearance & excavation

210 Stripping topsoil

1. Refer to Clauses: **D20/400 - 429** for requirements

215 Stripping subsoil

1. Refer to Clauses: **D20/430 - 499** for requirements

250 Permissible deviations from formation levels

1. Beneath mass concrete foundations: ±25 mm.

2. Beneath ground bearing slabs and r.c. foundations: ±15 mm.
3. Embankments and cuttings: ±50 mm.
4. Ground abutting external walls: ±50 mm, but such as to ensure that finished level is not less than 150 mm below dpc.

255 Accuracy - linear dimensions

1. Permissible deviations from linear dimensions generally: To Engineer's requirements

270 Foundations generally

1. Give notice if:
   1.1. A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
   1.2. The formation contains soft or hard spots or highly variable material.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times.
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

320 Recorded features

1. Recorded foundations, beds, drains, manholes, etc: Break out and seal drain ends or as advised by Engineer's requirements
2. Contaminated earth: Remove and disinfect as required by local authority.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

350 Existing watercourses

1. Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

370 Underground structures in landscape areas

1. Generally: Remove walls, roads, foundations, disused services, drains, manholes and the like to minimum depth.
2. Minimum depth below finished levels:
   2.1. Grass, ground cover and perennial planting: 500 mm.
   2.2. Shrub planting: 750 mm.
   2.3. Within 2 m of tree planting: 1000 mm.
3. Walls and slabs remaining: In every 10 m² of wall or slab, make a drainage hole at least 600 mm diameter.

Disposal of materials - Not Used

Topsoil stripping, reuse, disposal & storage

400C Reuse of site-won topsoil

1. Preliminary site investigations have indicated that the existing site topsoil is not suitable for re-use within the proposed landscape works
   1.1. Refer to: CAfor soil investigation report
2. Therefore, all topsoil to be used within soft landscape areas is to comprise imported topsoil in accordance with Section: **Q28** of this specification
3. Existing site topsoil, as indicated on: N/A, to be stripped in accordance with Section **D20** of this specification and disposed of off site
4. The Contractor is responsible for ascertaining accurate quantities necessary for the execution of the works
   4.1. Quantities to be confirmed, and agreed, with: CA , at Tenderstage
5. Any deficiency is topsoil supply (additional to that agreed at: Tenderstage) shall be imported by the Contractor at no additional cost to the Contract

405 Topsoil strip preparation

1. Treatment of grass vegetation on topsoil areas: Prior to the stripping of topsoil areas the existing surface vegetation shall be cut to a minimum height of 25mm, and arisings disposed of in accordance with the specification
2. Materials arising from the excavations, and surplus to requirements for filling or reuse, are to be removed from site
3. Topsoil stripped from the site and surplus to requirements is to remain the property of the Employer, unless the Contractor is instructed to remove it from the site and/or purchases it at a price to be agreed
4. Before beginning general excavation of filling, excavate topsoil from areas where there will be regrading, building works, paving/roads, site compounds and other areas, as specified
5. Clearly mark out on site the extent of all areas to be stripped as defined on the Contract Drawings
6. No topsoil stripping shall take place when, in the opinion of: Landscape Architect/CA, conditions are wet, frozen or such that soil structure damage may occur, especially following prolonged rainfall
7. Excavate trial holes (min 500x500x500mm) prior to stripping in order to confirm topsoil and subsoil depths (in locations as requested by: CA/Landscape Architect)
8. Topsoil stripping shall be carried out using the most appropriate machinery in order to avoid compaction and soil structure damage
9. Machine movement over the unstripped topsoil shall avoided
10. Stripped topsoil shall be transported, whenever possible, directly to its final location and evenly spread to specified depths in order to prevent more handling then necessary
11. Grub up and dispose of shrubs, bushes, roots, fences, hedges or other vegetation met within the areas to be stripped, as defined on the Contract Drawings.
12. Allow for making adjustments to setting out as directed on site
13. Collect and dispose of all loose rubbish, metal, stones, etc., lying on the areas to be stripped
14. Carefully strip to the full depth of organic topsoil over any areas to be stripped
15. Protected Area(s):
    15.1. Refer to Clause: **D20/162 - 165**
    15.2. Do not remove topsoil from within a Protected Area without: CAapproval
    15.3. No mechanical stripping is to be carried out within the branch spread of any tree to be retained

15.4. Allow for handworks/approved mechanical works only within a Protected Area

16. Topsoil must not be buried by subsequent operations

406 Stripping topsoil

1. General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, pavings/ roads and other areas shown on drawings
2. Depth:
   2.1. Remove to an average depth of: TBC - subject to source
   2.2. Give notice where the depth of topsoil is difficult to determine
3. Handling: Handle topsoil for reuse or sale in accordance with Clause: **D20/408**
4. Around trees: Do not remove topsoil from below the spread of trees to be retained
5. Site storage: Keep separate from excavated sub-soil. Locations TBC with CA

408 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds:
   2.1. Species: Included in the Weeds Act, section 2 or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
   2.2. Give notice: Obtain instructions before moving topsoil.
3. Contamination: Do not mix topsoil with:
   3.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   3.2. Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
   3.3. Oil, fuel, cement or other substances harmful to plant growth.
   3.4. Other classifications of topsoil.
4. Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.
5. Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall or when it is wetter than the plastic limit.

410 Excavated topsoil storage

1. Storage: Stockpile in temporary storage heaps: Locations TBC with CA

412 Topsoil storage

1. In order to prevent compaction of topsoil during stockpiling, the stockpiles shall be formed by tipping in mounds which shall not subsequently be tracked over by vehicles. Stockpiles shall be kept free of pernicious weeds. All arisings consequent upon this operation shall be removed off site to tip.
2. Topsoil stored in stockpiles shall be carefully transported, in order to prevent compaction, to required locations and evenly spread to specified depths. Areas used as stockpiles shall be reinstated to the original condition or as directed by: CA/Landscape Architect. Areas designated for topsoil storage shall be stripped of topsoil first.
3. Topsoil stockpiles shall be kept free of pollutants and other materials at all times.
4. Topsoil shall not be stored with subsoil.
5. Topsoil to be free of vegetation (either present at time of original stripping or subsequent growth on stockpile), at time of spreading.
6. Topsoil, shall be deposited loose in spoil heaps and shall not be compacted by any means. Topsoil spoil heaps shall be 'turned' after a period of: 6months and shall be re-seeded with green manures as required.

7. The spoil heaps are not to exceed: CA/Landscape Architect
8. Vehicles used to transport the topsoil, or any other vehicle, must not be allowed to run over the heaps at any time.
9. Heaps shall be shaped to prevent surface water accumulation. Mound batters should have appropriate gradients to avoid risk of slumping and to facilitate the maintenance of the stored soils.
10. Topsoil shall not be allowed to be contaminated with subsoil or any other unsuitable materials.
11. Subsoil storage heaps shall not be formed on areas until underlying topsoil has been stripped.

422 Management of topsoil heaps

1. Topsoil Quantities: CA
    1.1. The Contractor is then responsible for ensuring that the agreed quantity of topsoil is available for re-use.
2. Green Manures: : Immediately after storage operations, the Contractor shall sow all topsoil heaps with a green manure as detailed below:
    2.1. Prior to seeding of green manures, the Contractor shall shallow cultivate to produce a fine seed bed to: Landscape Architect 's approval and a 12:6:6 organic compound seed bed fertilizer (DLF Trifolium - *Pro Fert 3* or equal & approved) shall be applied at a rate of 50g/m² prior to seeding
    2.2. Sow topsoil heaps with Red Merviot Clover (Trifolium pratense) at a rate of: 250 g/ 75m², all to supplier recommendations
    2.3. Seeds may be obtained from (or equal & approved):
        2.3.1. Kings Seeds
        2.3.2. Monks Farm, Pantlings Lane
        2.3.3. Coggeshall Road
        2.3.4. Kelvedon, Colchester CO5 9PG
        2.3.5. **T**: 01376 570000
    2.4. Sowing shall be carried out by approved lightweight machinery or hand only
    2.5. Prior to the spreading of topsoil, all green manures shall be turned in
3. Maintenance & Handling: CA/Landscape Architect
    3.1. No heavy machinery shall be used on topsoil stores

Subsoil stripping, storage, reuse & disposal

430 General

1. Subsoil stripping, storage & handling to be in accordance with BS8601:2013: *Specification for subsoil and requirements for use*

435 Management of subsoil heaps

1. Subsoil Quantities: CA
    1.1. The Contractor is then responsible for ensuring that the agreed quantity of subsoil is available for re-use.
2. Fallow Sward: : Immediately after storage operations, the Contractor shall sow all subsoil heaps that are anticipated to be stored for a period exceeding 6 months with a fallow sward as detailed below.
    2.1. Prior to seeding of subsoil heaps with fallow swards, the Contractor shall shallow cultivate to produce a fine seed bed to: Landscape Architects 's approval and a 12:6:6 organic compound seed bed fertiliser (DLF Trifolium - *Pro Fert 3* or equal & approved) shall be applied at a rate of 50g/m² before sowing.
    2.2. Sow subsoil heaps with the following seed mixture at: 10g/m²:

2.2.1. 25% Italian Perennial Rye Grass
2.2.2. 15% Chewings Fescue
2.2.3. 10% Hard Fescue
2.2.4. 20% Slender Creeping Red Fescue
2.2.5. 15% Highland Browntop Bent
2.2.6. 5% Hula White Clover
2.2.7. 10% Common Vetch

2.3. Seeds may be obtained from (or equal & approved):
2.3.1. Kings Seeds
2.3.2. Monks Farm, Pantling Lane
2.3.3. Coggeshall Road
2.3.4. Kelvedon, Colchester CO5 9PG
2.3.5. **T:** 01376 570 000

2.4. Sowing to be carried out by approved lightweight machinery or hand only

3. Maintenance & Handling: CA/Landscape Architect
3.1. Following establishment of the fallow sward, the Contractor shall maintain the sward between a height of 50-100mm and remove all arisings and dispose of off site
3.2. No heavy machinery shall be used on subsoil stores

441 Surplus subsoil

1. Excavated material: Stockpile in temporary storage heaps.
2. Retained material: Spread and level surplus subsoil on site.
2.1. Locations: TBA with CA
2.2. Protected areas: Do not raise soil level within root spead of trees that are to be retained.
3. Remaining material: Remove from site.

Ground water, drainage, etc.

450 Water

1. Generally: Keep all excavations free from water until:
1.1. Formations are covered.
1.2. Below ground constructions are completed.
1.3. Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
2. Drainage: Form surfaces of excavations and fill to provide adequate falls.
3. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 Ground water level, spring or running water

1. Give notice: If it is considered that the excavations are below the water table.
2. Springs/ Running water: Give notice immediately if encountered.

457 Pumping

1. General: Do not disturb excavated faces or stability of adjacent ground or structures.
2. Pumped water: Discharge without flooding the site or adjoining property.
3. Sumps: Construct clear of excavations. Fill on completion.

3.1. Locations: TBA with CA

460 Permanent drainage system

1. Disposal of water from the excavations through system: Refer to Engineer's requirements

Filling

500 Proposed fill materials

1. Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
   1.1. Type and source of imported fill.
   1.2. Proposals for processing and reuse of material excavated on site.
   1.3. Test reports as required elsewhere.
2. Timing: at least 21 days prior to starting filling

510 Hazardous, aggressive or unstable materials

1. General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
   1.1. Frozen or containing ice.
   1.2. Organic.
   1.3. Contaminated or noxious.
   1.4. Susceptible to spontaneous combustion.
   1.5. Likely to erode or decay and cause voids.
   1.6. With excessive moisture content, slurry, mud or from marshes or bogs.
   1.7. Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
   1.8. Unacceptable, class U2 as defined in the Highways Agency 'Specification for highway works', clause 601.

520 Frost susceptibility

1. General: Except as allowed below, fill must be non frost-susceptible as defined in Highways Agency 'Specification for Highway Works', clause 801.8.
2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
   2.1. Fine grained soil with a plasticity index less than 20%.
   2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
   2.3. Crushed chalk.
   2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
   2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
   3.1. At depths below the finished ground surface greater than: 450 mm or as stated in the Engineer's requirements
   3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
   3.3. Where frost heave will not affect structural elements.

525A Testing of suitability of fill materials before start of filling

1. Refer to Engineer's requirements.

530 Placing fill

1. Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
2. Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
3. Adjacent structures, membranes and buried services
    3.1. Do not overload, destabilise or damage.
    3.2. Submit proposals for temporary support necessary to ensure stability during filling.
    3.3. Allow 14 days (minimum) before backfilling against in situ concrete structures.
4. Layers: Place so that only one type of material occurs in each layer.
5. Earthmoving equipment: Vary route to avoid rutting.

535 Compaction generally

1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

540 Benching in fill

1. Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
2. New filling: Spread and compact to ensure maximum continuity with previous filling.

605 General filling for landscape

1. Exclude the following:
    1.1. Material from marshes or bogs
    1.2. Peat, logs, stumps, slurry, mud and perishable material
    1.3. Material susceptible to spontaneous combustion
    1.4. Material in frozen condition
    1.5. Clay in liquid limit exceeding 80 and/or plasticity index exceeding 55
    1.6. Material with excessive moisture content

606 Subsoil for planting areas

1. Minimum depths of subsoil, for different planting typologies, are defined on the Contract drawings. Together with the specified minimum topsoil depths, these depths have been defined in order to achieve a viable rooting depth for the proposed planting within all planting areas.
2. The subsoil is intended to be in a suitable condition for root growth and should comply with the following:
    2.1. Subsoil should be free from:
    2.2. Material from marshes or bogs
    2.3. Peat, logs, stumps, slurry, mud and/or perishable material
    2.4. Material susceptible to spontaneous combustion
    2.5. Material in a frozen condition
    2.6. Clay in liquid limit exceeding 80 and/or plasticity index exceeding 55
    2.7. Material with excessive moisture content
    2.8. Subsoil should have a pH within the range: 5.5 - 8.5

2.9. Phytotoxic contaminant levels should meet the requirements for imported topsoil -: **Q28**

2.10. Zootoxic contaminant levels should meet the requirements for imported topsoil -: **Q28**

2.11. Subsoil should be excavated natural subsoil having a proportion of organic matter

610 Compacted filling for landscape areas

1. Fill: Material capable of compaction by light earthmoving plant.
2. Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.

615 Loose tip filling for landscape areas

1. Filling: Do not firm, consolidate or compact when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

616 Acceptance of suitable fill

1. Give at least 72 hours notice before any earthworks operations
2. Provide: CA/Project Engineerwith test data obtained on the materials to be used for filling, to prove their suitability and identify the target density for 'End Product' compaction
3. Provide daily records of testing of the material placed to show compliance with the specification. The minimum requirements are:
   3.1. Grading: At least once a day or one test for every: 50m³ placed
   3.2. Moisture Content and Undrained Shear strength (cohesive material): Three times a day or at least one test every: 20m³
   3.3. Plasticity Tests: One test per day for each source or for every: 50m³ placed

627 Compacted general filling

1. In accordance with: the Engineer'sdrawings & specification

650 Protection of compacted filling

1. Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
2. Removal: Remove temporary protective filling from site before permanent construction.

701 Backfilling around foundations

1. Under oversite concrete and pavings: In accordance with: the Engineer'sdrawings & specification
2. Under grassed or soil areas: Material excavated from the trench, laid and compacted in 300 mm maximum layers

711 Hardcore filling

1. In accordance with: the Engineer'sdrawings & specification

731 Blinding

1. In accordance with: the Engineer'sdrawings & specification

Landscape subsoil grading and cultivation prior to topsoil placement

790 Subsoil preparation

1. Formation levels /bulk subsoil levels are to be placed: by the Main Contractor
2. The Landscape Contractor's rates shall include for the fine grading and adjustment to these levels, so that the following are accurately achieved:

2.1. Smooth flowing contours

2.2. Prescribed topsoil depths

2.3. Specified finished levels

3. Prior to commencing fine grading the Landscape Contractor shall inspect/check the formation levels and be satisfied with the works before acceptance.
4. Written reason must be given immediately to the: CAif any formation levels placed by others are considered unsatisfactory.
5. All groundwork is to be carried out in accordance with BS4428 unless specified otherwise hereafter.
6. Excavate locally as necessary for areas of thicker topsoil.
7. Small planting beds located in general landscape areas may be excavated separately at a later date.
8. Cultivated areas are to be thoroughly cleaned and all extraneous matter, including broken brick, broken glass, tarmac and large stones (over 200mm diameter), or organic matter exposed by this operation are to be removed and carted to tip.
9. Carry out minor grading and regulating to remove local depression and high spots. Levels shall be brought to a uniform and even surface as required.
10. The use of a heavy roller to roll out humps will not be permitted, and any area that becomes unduly compacted during the grading operation shall be loosened by forking or harrowing.

791 Subsoil decompaction

1. Decompact all areas of subsoil prior to topsoiling to a depth of 300mm using a 3-tine ripper with tines set at 600mm spacing, and by crossing the ground twice at 90° in two directions (after checking for service locations to ensure no damage will be caused). Where stiff clays or other cohesive material is found, loosen subsoil with a single tine ripper, 450mm deep at 1m centres and drawn by a crawler tractor. The Contractor shall make allowance for the use of a long armed excavator, or a toothed excavator bucket, on steep banks to carry out the operation if restricted or in areas where ripping using a tine is inappropriate.

795 Bulking

1. The Contractor's attention is drawn to the fact that any measurements of excavation and subsequent disposal are net measured, and that the Contractor's price should allow for any increase in bulk and for the transportation of excavated material to and from temporary heaps, as may be necessary. The Contractor shall make an allowance for settlement during/after placing in order to give (after settlement) depths as specified.

798 Approval of formation operations

1. No top soiling is to be commenced until the grading and cultivation of the existing soil areas have been approved by the: Landscape Architect. Any topsoil spread before such approval is given must be stripped and subsequently re-spread at the Contractor’s expense.
2. Refer also to Clause: **D20/790** above.

Bioremediation - Not Used

'specification for highway works: earthworks specification' appendices - Not Used

Ω End of Section

E70
Finishes to precast concrete

Clauses

1 Untitled

1. Description: And with the structural engineer's specification

5 Section index:

1. 0 - 99: GENERAL
2. 100 - 149: MATERIALS
3. 150 - 199: MOULDS, FORMWORK, ETC.
4. 200 - 299: FABRICATION
5. 300 - 399: FINISHES
6. 400 - 499: PRECAST CONCRETE ELEMENTS
7. 500 - 599: ACCESSORIES, FIXINGS, ETC.
8. 600 - 699: SITE CONTROL
9. 700 - 799: PROTECTION

General

10 Reference documents

1. BS 5642-2:1983 + A1:2014: *Sills, Copings, and Cappings. Specification for copings and cappings of precast concrete, cast stone, clayware, slate & natural stone*.
2. BS 8110-1:1997: *Structural Use of Concrete. Code of Practice for Design & Construction.*
3. BS 8297: 2000: *Code of Practice for Design & Installation*.
4. BS EN 1992-1-1:2004 + A1:2014: *Eurocode 2: Design of Concrete Structures: General Rules and Rules for Building*.
5. NA + A2:2014: *UK National Annex to Eurocode 2: Design of Concrete Structures. General Rules and Rules for Building*.
6. BS EN 12620:2013: *Aggregates for Concrete*.
7. BS EN 13369:2013: *Common Rules for Precast Concrete Products*.
8. BS EN 14843:2007: *Precast Concrete Products. Stairs*.
9. BS EN 14992:2007 + A1:2012: *Precast Concrete Products. Wall Elements*.
10. PD CEN/TR 15739:2008: *Precast Concrete Products. Concrete Finishes. Identification.*

15 General requirements

1. This section of the Specification, when read in conjunction with the Design Drawings, provides particular requirements with respect to the following:
   1.1. Architectural finishes for Precast Concrete elements where exposed to view
2. This specification should be read in conjunction with the following:
   2.1. Design Drawings
   2.2. Structural Engineer's Specification
   2.3. Structural Engineer's Drawings
3. Although Precast Concrete shall generally be in accordance with the: Structural Engineer's Specification, this section shall be read as an addendum to, and in conjunction with, the Structural

Engineer's Specification. This Specification shall take precedence over the Structural Engineer's Specificationin all matters relating to exposed finishes and visual requirements.

4. All materials and methods selected by the Contractor shall be made so as to ensure the specified finishes.

20 Scope of works

1. Complete the detailed design of precast concrete elements in accordance with Design Intent drawings and this Specification
2. Complete the detailed design of all interfaces with adjoining trades prior to commencement of manufacture
3. Co-ordinate the design, construction, supply and installation of all Precast Concrete elements
4. Provide samples, mock-ups, benchmarks, etc., in accordance with this specification, for the proposed finishes
5. Allow the: CA/Landscape Architectaccess to the Contractor's place of manufacture, finishing and off-site storage of the moulds and precast units when requested

25 Tender submittals

1. Provide tender submittals in accordance with the requirements of the Specification
2. Submit a design response with the Tender proposal, to include all profiles of typical conditions, with dimensions
3. The Tender design response shall include:
    - 3.1. Draft programme indicating Working Drawing programme, sample unit construction, approval periods
    - 3.2. Choice of moulds/formwork
    - 3.3. Proposed mixes and treatments within method statements to achieve precast finish specified
    - 3.4. Transportation and storage of units method statements
    - 3.5. Outline of construction sequence, i.e. installation and adjustment of unit installation, alignment and propping
    - 3.6. Samples where specified
    - 3.7. List of tests included
    - 3.8. QA/ QC programme
    - 3.9. List of proposed Working Drawings
    - 3.10. Summary of deviations from the Specification
    - 3.11. Outline technical specifications reflecting proposed materials/ systems, etc., including formwork materials proposed for use
    - 3.12. A list of proposed suppliers and Sub-contractors intended to be used

35A Testing

1. Refer to the: Structural Engineer's Specification

40 Colour consistency

1. The consistency of the concrete colour is deemed to be of great importance on the project
2. Select all suppliers and materials and all methods to ensure the specified finish and consistency, including but not limited to, the following:
    - 2.1. Main plant to have consistent supply to achieve specified finish, to acceptance
    - 2.2. Back-up plant selected to achieve equivalent supply

3. Agree with the: CA/Landscape Architectthe colour range that shall be acceptable, based on the the on-site prototype or other benchmarks or samples which shall then become the colour standard for the project

45 Working drawings

1. The Contractor is to provide working drawings showing all formwork and temporary works details
2. Details of all fittings, features, associated formwork and temporary works for installation shall be included
3. Typical details will not be accepted

Samples, mock-ups, prototypes & benchmarks

50 Pre-contract samples

1. Pre-contract samples shall be provided as follows:
    1.1. 600mm x 600mm sample of all precast concrete types specified using proposed formwork and mix.
    1.2. Sample range of upper and lower limits (maximum range) of colour and texture variations for acceptance by the: CA/Landscape Architect

90 Benchmarks

1. Quality benchmarks shall be provided as follows:
2. - P9 Pre-cast concrete panels
3. Location: Complete as part of the finished works - submit proposals for approval. Location to be selected to provide a good representation of all features to be incorporated.
4. Included features: Min. 1no. joint
5. Size: 750 x 500mm panels, 2 no, min.
6. Approval of appearance: To be obtained prior to proceeding

Materials

100 Materials generally

1. The materials for all the works shall be consistent and from the same source
2. Bulk purchasing and premixing a material where inconsistency is a risk (e.g. the aggregate) is essential
3. The cement shall be: grey Ordinary Portland Cement unless otherwise stated and/or agreed with the CA/Landscape Architect

105 Aggregates

1. Aggregates shall be selected in accordance with the recommendations of BS EN 12620
2. Aggregates shall be of consistent colour, free from absorbent particles that may cause pop-outs and other particles such as coal and iron sulphide that may be unsigtly or cause unacceptable staining
3. Obtain from one source, and ensure that adequate supplies can be maintained throughout the contract
4. Submit evidence to demonstrate compliance in respect of compressive strength and free water/cement ratio

110 Aggregates - coarse aggregate

1. The preference is for a single sized, rounded aggregate of nominal 20mm diameter (19-15mm)

1.1. A blend of 20mm and 10mm single sized aggregate may be acceptable provided that not more than 20mm passes through a 10mm sieve

1.2. Single sized crushed aggregate and blended crushed aggregates will be considered if rounded gravel is not locally available, but will be subject to batching trials

2. All coarse aggregate used shall be from the same source and supplier, for consistency of colour between batches

115 Aggregates - sand

1. The sand should be well-graded medium sand, without excessive fine dust, and be of the same colour
2. The quantity of fines passing the 150 micron sieve must be declared and the widest variation reported, as any significant variation can affect the final concrete tonal colour
3. All sand used shall be from the same source and supplier, for consistency of colour between batches

120 Cement

1. The concrete must have cement content not less than 325 kg/m³
2. The cement shall be a PC or PC/GGBS blended cement, unless noted otherwise, taken from the same source to eliminate changes in cement colour. For a blended cement, the ratios must be stated.
3. The cement content and water/cement ratio will be fixed for all concrete supplied to the contract and must not be adjusted at any time during the contract. The workability can be adjusted by increasing or decreasing the admixture dosage.
4. The water:cement ratio shall not exceed 0.5: 1. Once the ratio has been agreed, it must not be adjusted at any time during the contract, as any variation in the water/cement ratio and the cement content will affect the concrete surface colour.
5. Sand/cement ratio: The sand:cement ratio by weight shall not exceed 2:1, in order to reduce the risk of blowholes forming
6. Aggregate/cement ratio: The total aggregate:cement ratio shall not exceed 6:1

130 Additives

1. Any plasticiser, water reducing admixtures or additives used in the mix must be stated

Moulds, formwork, etc.

150 Moulds generally

1. Moulds shall be on such construction that casting deviations can be readily controlled to give compliance with this Specification
2. Moulds shall be maintained in a clean, sound condition and be inspected carefully for defects before each reuse

2.1. Damaged moulds shall not be repaired and reused if this would impair the surface appearance of the units

3. Moulds shall be designed to permit demoulding without damage to the units
4. Where applicable, moulds shall be coated evenly with a suitable release agent, which shall not be allowed to touch the reinforcement

4.1. Application shall be such as to prevent puddling or concentrations in corners, etc.

5. Moulds shall be constructed of mould lining that is an impervious material suitable to provide the consistency of finish required and selected to provide crisp edge details as indicated: on the Design Drawings

5.1. The mould linings shall not be of steel unless agreed with the: CA/Landscape Architect

5.2. Materials for fillets, etc., required to achieve features shall be chosen to provide a finish identical to the finish of the body of the unit

6. Any joints and fixings in mould linings shall be sealed to prevent grout loss defects and shall be such as to result in no visible change in plane of the concrete and no change in the finish whatsoever
7. The mould linings shall have no variations in stiffness that may produce differences in vibration across the mould surface
8. The mould linings shall be replaced after the agreed maximum number of casts, or upon discovery of damage or defects, whichever is sooner
9. Before casting, ensure that moulds have been checked to be free of all dust, reinforcement clippings or other debris
10. Moulds for features, etc., shall not have any splits, cracks or other defects
11. Moulds that have been previously used shall be repaired and the edges resealed before they are assembled.

11.1. Moulds which, in the opinion of the Contractor, have deteriorated to an extent such that they shall not produce the specified finish, shall not be used for that class or a higher class of finish

12. Moulds shall be cut in such a manner that reinforcement and built-in components passing though the moulds are maintained in position

12.1. The joint shall be tight and shall not permit grout loss

13. Formers for profiled work, chamfers, splays, rebates, curved troughs and other features shall be rigidly and evenly fixed to the formwork along the complete length and shall not permit grout loss
14. Moulds shall be designed to be consistent with the geometry, and as indicated on the Drawings, subject to the acceptance of the: CA/Landscape Architect

14.1. The number of make-up pieces shall be kept to a minimum

15. Holes left by ties and components in concrete surfaces shall be in line horizontally and vertically and shall form a regular pattern, to the acceptance of the: CA/Landscape Architect
16. Unless otherwise indicated: on the Design Drawings, chamfers shall be provided for all external angles of 90° or less in concrete surfaces with plain or fine finishes

155 Mould inspections

1. Inform the: CA/Landscape Architect when each mould is complete and not less than 10days before commencing manufacture of units

160 Materials and construction for moulds

1. Materials for moulds shall be obtained from one source
2. Damaged moulds shall not be used unless permitted by the: CA/Landscape Architect
3. Propose materials for use in moulds in the Tender, for acceptance by the: CA/Landscape Architect
4. Moulds shall be protected from spillages, rust marks, stains or any other debris or harm whatsoever

165 Built in components

1. Built-in components, such as recesses for anti-slip strips to be incorporated into precast steps, as detailed on the drawings shall comply with the following:

1.1. Do not cut hardened concrete to provide holes or chases

1.2. Formwork moulds to be rigid and free from movement that shall affect their performance with regard to tolerances and/or colour of concrete

1.3. Allow for all necessary mid-rib reinforcement of the moulds

Fabrication

200 Generally

1. Conform to the procedures of the British Precast Concrete Federation and BS 8297
2. Precast concrete elements shall be worked to the sizes defined by the drawings and shall be within the recommended deviations
3. They shall hold out reasonably square at the back, i.e. without corners broken away whereby the strength of the fixing system may be impaired
4. Broken corners to any visible elements shall not be permitted

210 Quality control & monitoring requirements

1. Proposals shall be submitted for ongoing monitoring and quality control of the concrete: with the Tender submission
2. Set up a system of "Hold" and "Monitor" points in the works to ensure that the quality achieved is accepted by the: CA/Landscape Architectprior to further pours proceeding
3. As soon as possible after any concrete has been deemed as unacceptable within the requirements of the Specification, submit proposals to the: CA/Landscape Architectfor the removal and reconstruction of that section of the works
   3.1. This requirement applies to all elements of the works

220 Batching, mixing and transport

1. Extreme care shall be taken to ensure that accurate and consistent batching and mixing are carried out to achieve the specified quality of finish, e.g. added water shall allow for the moisture content of the aggregate to achieve a similar slump for each mix
2. Select mix proportions and aggregate to achieve the specified colour to match the sample held at: the CA's office
3. Proposals shall be submitted with: the Tender, which shall have to be expanded upon if acceptable, together with a demonstration of the proposed methods of practice by constructing a full size quality-control prototype
4. Consideration shall be given to the use of a dedicated main mixing and batching plant to avoid contamination of the mix
   4.1. A stand-by back-up plant shall also be available that is capable of providing equivalent mix and batching facilities
   4.2. The use or otherwise of such a plant shall be stated in the Contract documentation

230 Construction

1. Precast concrete units forming permanent shuttering for concrete slabs and walls shall incorporate joints that are fully watertight to prevent any water or grout seepage/ loss through joints during concrete curing which may lead to staining of visible faces of precast concrete
2. Such joints shall provide continuous impervious water retention with no weak points or areas of local leakage
   2.1. Provide details of methods and sealant material for achieving this at the time of: Tender , for acceptance by the CA/Landscape Architect

240 Inserts, holes and chases

1. Confirm all positions and details to ensure that alterations to and decisions about the size and location of inserts, holes and chases are not made without the knowledge and acceptance of the: CA/Landscape Architect
2. Fix inserts or box-outs as required in the correct positions before placing concrete
   2.1. Form all holes and chases

2.2. Do not cut hardened concrete without acceptance

3. Ensure that all fixings and holding-down bolts, etc., are not disturbed or damaged during construction

250 Production control unit(s)

1. The first unit produced of each type shall be inspected at the works by the: CA/Landscape Architect
   1.1. If its appearance is accepted it shall be clearly marked and kept safely at the factory as a control standard for appearance of subsequently produced units
2. Allow for inspection of all units at the works and provide adequate space and facilities for full inspection of all surfaces
3. Refer also to Clauses: **E50/50 - E50/99**for additional requirements

260 Inspection

1. Carefully inspect and check all completed units for match with accepted sample(s) and/or control unit(s) and compliance with the Specification before dispatch to Site.
2. Make arrangements with the: CA/Landscape Architectfor them to inspect the completed units/elements in the factory

270 Records

1. Keep complete records for each unit/element including the following information:
   1.1. Unique identification number
   1.2. Correlation with records of mixes, including batch numbers
   1.3. Date of each stage of manufacture
   1.4. Dates and results of all tests, checks and inspections
   1.5. Dimensions related to specified levels of accuracy
   1.6. Specific location in the finished work
   1.7. Details of any damage
   1.8. Any other pertinent data, e.g. if the unit is an accepted production control unit
2. Records shall be available for inspection on request.

280 Rejected units/defects

1. Precast units may be rejected for the following reasons:
   1.1. Exceeding specified construction tolerances for units
   1.2. Chipped, spalled or cracked units or other damage incurred during transport or construction operations
   1.3. Exposed-to-view surfaces that develop surface finish deficiencies
   1.4. Other defects as listed, including:
   1.5. Ragged or irregular edges
   1.6. Finish quality below standard set by samples or mock-up
   1.7. Excessive air voids/ blowholes on exposed surfaces
   1.8. Casting lines evident from different placements
   1.9. Visible form joints or irregular surfaces
   1.10. Stains on unit surfaces
   1.11. Non-uniformity of colour and texture
   1.12. Effects of grout seepage
   1.13. Areas of any back-up concrete bleeding through facing concrete

1.14. Foreign material embedded in face
1.15. Visible repairs
1.16. Reinforcement shadow lines
1.17. Visible cracks
1.18. Any damage due to erection methods, propping panels, etc.

285 Damaged units

1. Making good shall be minimal and consistent to an accepted sample.
   1.1. As far as possible the finished surface shall be achieved without making good.
   1.2. The improvement of the surface finish by the Contractor (e.g. filling noticeable surface blemishes) must be agreed with the: CA/Landscape Architect, prior to any work being carried out.
   1.3. Blowholes shall be filled and all irregularities stoned off.
   1.4. Provide continuity of personnel for making good, where required, to the complete acceptance of the: CA/Landscape Architect
2. Components having arrises or faces that are broken, chipped, cracked, crazed, honeycombed, irregular, inconsistent, stained or otherwise marred such that their appearance or performance is impaired shall not be acceptable
3. Submit finished samples to the: CA/Landscape Architectfor approval prior to commencement
   3.1. Finished samples of precast concrete units which have been submitted and accepted by the: CA/Landscape Architectshall be used as reference samples for all precast units prior to being passed for inclusion into the works, to the acceptance of the CA/Landscape Architect

Finishes

310 Surface finish of concrete - quality

1. The quality of concrete finish shall be identified by the following classifications in accordance with BS 8110-1:1997:
   1.1. Class 2: Applicable to surfaces that are to be exposed to view but where appearance is not critical
   1.2. Class 1: Applicable to most surfaces exposed to view, with additional finish requirements as further described herein
   1.3. Special Class: Applicable to high standards of appearance as required by the Landscape Architect

315 Surface finish of concrete - type

1. The Type of finish shall be identified by the following codes, in accordance with BS 8110-1:1997:
   1.1. Type A finish: This finish shall be achieved by the use of properly designed formwork or moulds of timber, plywood, plastics, concrete or steel. Small blemishes caused by entrapped air or water may be expected, but the surface shall be free of voids, honeycombing or other blemishes.
   1.2. Type B finish: This finish shall be achieved by the use of high quality concrete and formwork. The concrete shall be thoroughly compacted and all surfaces shall be true, with clean arrises. Only very minor surface blemishes shall occur and no staining or discolouration from the release agent shall be permitted.
   1.3. Type C finish: This finish is obtained by first producing a Type B finish. The surface shall then be improved by carefully removing all fins and other projections, thoroughly washing it down and then filling the most noticeable surface blemishes with a cement and fine aggregate paste to match the colour of the original concrete. The release agent shall be carefully chosen to ensure that the concrete surface does not become stained or

discoloured. After the concrete has been properly cured, the face shall be rubbed down, where necessary, to produce a smooth and even surface.

330 Precast concrete finish

1. Description: All elements
2. Smooth dense, even-coloured, blemish-free as-struck finish, to provide Class 1, Type B surface finish to BS 8110-1: 1997, uniform in appearance.
3. The finish shall have the following additional requirements:
   - 3.1. Crack widths in the exposed surfaces of the concrete shall not exceed 0.3mm
   - 3.2. Smooth dense as-struck finish with an acid-washed finish to be applied to all visible precast concrete to: Landscape Architect's approval
   - 3.3. A smooth, matt, dense, even-coloured, blemish-free concrete surface using: greycement
   - 3.4. The finishes shall be: **uniform in colour and appearance** throughout the works
   - 3.5. The surfaces shall be free from discolouration caused by contamination from release agent, grout leakage, rust staining or other sources
   - 3.6. Abrupt irregularities shall be not greater than: 1mm . Gradual irregularities expressed as maximum permissible deviation from a 1m straightedge shall not be greater than 3mm
   - 3.7. Produce a smooth even finish with an impervious high quality resin film faced plywood or acceptable equivalent sheet material arranged in an accepted regular pattern as a feature of the surface.: This shall coincide with the architectural features as indicated on the Design Drawings.
4. There shall be no uneven distribution of aggregate across all visible faces of concrete columns and beams.
5. Other requirements: n/a
6. Generally, surfaces shall be free of voids, honeycombing, segregation and other defects. Voids shall be kept to an absolute minimum whilst ensuring compliance with other requirements of the Specification. The following maximum acceptable limits for air voids/ blowholes shall be observed:
   - 6.1. No more than 20mm² of holes for any 100mm x 100mm of surfaces area
   - 6.2. Maximum size of any visible holes is 5mm
7. Cover spacers: Do not use without acceptance

Precast concrete elements - Not Used

Accessories, fixings, etc. - Not Used

Site control

610 Storage

1. All materials shall be suitably stored on site, clear of the ground with protection from inclement weather and contamination by other materials, and kept dry
2. Precast concrete units shall be stored so as to prevent soiling, chipping and any mechanical damage, contamination by salts and other deleterious substances

620 Setting out

1. The Contractor is responsible for providing full setting-out drawings of all precast units, for acceptance by the: CA/Landscape Architect

630 Installation and propping

1. Design and develop methods of propping and alignment of precast units to achieve accurate positioning without any damage or effects on the finishes of the units whatsoever

2. Consider locating self-aligning/ locating heads, etc.
3. Provide anchorage points/ lifting devices in locations so that they are not visible on exposed faces
4. Provide adequate edge protection to prevent damage during propping and installation process

640 Final fixings

1. Ensure that the appearance of each elevation is acceptable before tightening the fixings, filling the bed joints and/or dowel pockets or sealing the joints
2. Where appropriate, tighten the threaded fastenings to the torque figures recommended in writing by the manufacturer
    2.1. Do not overtighten restraint fixings intended to permit lateral movement.
3. Dowel bars and recessed lifting devices shall be filled with a polyester mix, be well tamped in and shall not be in the visible faces of the unit without prior agreement

650 Damaged units

1. Do not repair without acceptance
    1.1. Such acceptance will not be given where the units are damaged or where the proposed repair would impair appearance or performance

660 Cleaning

1. Clean dirt or blemishes from exposed surfaces
2. Wash and rinse in accordance with the precast concrete manufacturer's recommendations
3. Protect adjacent surfaces from damage caused by cleaning operations
4. Do not use cleaning materials or processes that could alter the character of exposed finishes

670 Accuracy of erection

1. The structure, including any fixing inserts, shall be surveyed fully before commencing erection
2. Each precast concrete element shall be clearly marked with a unique identification symbol.
    2.1. Where applicable, e.g. for step units, this marking should be sequential to aid correct installation of elements
3. Production and storage of units shall be arranged so that delivery in accurate sequence for site fixing is possible
4. Within the length of any joint (including in-line continuations across transverse joints) the greatest width shall not vary by more than ±2mm
    4.1. Any variation shall be evenly distributed with no sudden changes.
5. The average width of an individual joint between units, compared with the nominal design width of the joint as specified, shall not vary by more than ± 2mm
6. Unit edges at a joint out of parallel shall not taper by more than 3mm, in overall height of joint between units
7. A jog in alignment of a unit edge from one unit to another shall not exceed 2mm
8. The offset in planes between the vertical faces of adjacent units across any joint shall not exceed 2mm
9. Aligning heads shall be incorporated into the units so as to be concealed in the final works

Protection

710 Protection of the works

1. Provide full and adequate protection for the works against the effects of weather during storage, handling & hoisting into position, transport and during and after installation

2. Provide full and adequate protection for the works, until Practical Completion of the project, against damage or accidental spillage of liquids that may discolour the concrete finishes
3. The protective measures used shall not in any way permanently mark or damage the concrete finishes

Ω End of Section

F10
Brick/ block walling

Clauses

2 To be read with preliminaries/ general conditions.

Types of walling

110 Retaining Wall and Coping

1. Description: Retaining edge facing and copings
2. Retaining walls, up to 750mm high (refer to typical boundary details). Structural component to Structural Engineer's design. : Refer to drawing: AGV-GRA-BZ-XX-DR-L-003501
3. Brickwork to marry into existing where necessary or match Architectural façade material where adjacent to building:

Testing - Not Used

Workmanship generally - Not Used

Additional requirements for facework

830 Cleanliness

1. Facework: Keep clean.
2. Mortar on facework: Allow to dry before removing with stiff bristled brush.
3. Removal of marks and stains: Rubbing not permitted.

Ω End of Section

L37
External stair, ramps, handrail and balustrades systems

General

150 Handrail systems

1. Description: Bespoke handrail. To specialist design and specification.
2. System manufacturer: Contractor's choice. Submit proposals including shop drawings for approval prior to fabrication
3. Material: Carbon steel.
   3.1. Finish: Hot dip galvanized to BS EN ISO 1461 and Polyester powder coated.
   Colour: RAL to match Architectural metalwork.
4. Height (to upper surface of handrail)
   4.1. Above pitch line: 900mm
   4.2. Above landing: 900mm
5. Accessories: - Cover plate to posts 110mm dia x 5mm high. Finish and Colour to match posts.
   - Handrail: elliptical 50mm wide x 40mm deep. Finish and Colout to match posts.
   - Joints: welded. To be neatly filled and chamfered smooth with no burrs.
6. Method of setting posts: Baseplate fixed, below finishes. Note baseplate size, depth and fixing points subject to Structural Engineer input to suit
   anticipated loadings.
7. Mock-ups : Fabrication drawings to be produced by specialist for landscape architect approval. A mock up of 1.5m length including post and fixing to be supplied to landscape architect approval prior to manufacture.

System performance - Not Used

Products

315 Concrete stone step unit

1. Description: Concrete step units.
2. Manufacturer: Tobermore or equal approved
   2.1. Product reference: Braemar Step flag & Braemar Step riser or equal approved
   with Contrasting Nosing 55mm x 50mm
3. Standard: To BS EN 771-5.
4. Size
   4.1. Surface width:
   4.2. Going: 300mm & 400mm
   4.3. Rise: 160mm
5. Colour: As provided. Silver

Fabrication

510 Fabrication generally

1. Design: Complete the detailed design and obtain approval prior to commencing fabrication.
2. Shop drawings: Submit.
3. Structural calculations: Submit.
4. Frameworks: Assemble and brace, including temporary members required for installation.

5. Contact between dissimilar metals: Avoid.
6. Fixings: Fully bolt together. Tighten bolts.
7. Temporary support: Do not subject members to non-design loadings.

Execution

610 Loading

1. Site activities: Restrict, to ensure that design loads are not exceeded, or submit proposals for temporary supports.

620 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: Designated not less than GEN 1 or standard prescribed not less than ST2.
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

630 Setting components in concrete

1. Holes:
2. Components: Accurately positioned and securely supported.
3. Concrete fill: Compact as filling proceeds.
4. Concrete foundations exposed to view: Finished to weathering profile to shed water and trowel smooth.
5. Temporary component support: Maintain undisturbed for minimum 48 hours.

650 Installation generally

1. Fasteners: To section Z20.
2. Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
3. Temporary support: Do not use finished work as temporary support or strutting for other work.
4. Applied finishes: Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as finish manufacturer's recommendation before application.

660 Installation of manufactured stone elements

1. Selection: Do not use damaged units.
2. Accuracy
    2.1. Courses: Level and true to line.
    2.2. Faces, angles and features: Plumb.
    2.3. Setting out: Achieve satisfactory junctions and joints with adjoining or built-in elements and components.
3. Absorbent units: Dampen in warm weather to reduce suction.
4. Dowels:
5. Mortar joints:
    5.1. Laying: Full bed of mortar with all joints and voids filled.
    5.2. Temporary distance pieces: Lead or stainless steel. Remove when mortar is sufficiently strong.

5.3. Appearance: Neat and consistent.

6. Cleanliness: Keep facework clean. Rubbing and other abrasive or chemical cleaning methods to remove marks and stains, not permitted.
7. Cutting of reinforced units: Not permitted.

662 Adverse weather

1. General: Do not use frozen materials and do not lay on frozen surfaces.
2. Working limits: Do not lay blocks/ dressings:
   2.1. Cement gauged mortars: When the air temperature is at or below 3°C and falling or below 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and work is thoroughly protected).
   2.2. Hydraulic lime:sand mortars: When the air temperature is at or below 5°C and falling or below 3°C and rising.
3. Temperature of the work: Maintain above freezing until mortar has fully set.
4. Newly erected work: Protect from precipitation; Prevent rapid drying in hot conditions.
5. Remedial work: Rake out and replace mortar damaged by frost.
   5.1. Damaged work: Rebuild.

Completion

910 Inspection

1. Timing:
2. Period of notice (minimum): 3 working days.

915 Slip resistance testing

1. Surfaces to be tested: L37/ 315.
   1.1. Surface condition: Dry and wet
2. Timing: Two weeks prior to handover, but after initial cleaning
3. Period of notice (minimum): 3 working days.
4. Test standard: To BS 1134
   4.1. Testing authority: An approved laboratory
   4.2. Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Project manager.
   4.3. Report: Submit.
      4.3.1. Format: As required under BS 1134

920 Documentation

1. Contents
   1.1. Copies of structural design calculations/ test reports.
2. General product information.
   2.1. Installation information.
   2.2. Inspection and maintenance reports.
3. Number of copies:
4. Submission:

Ω End of Section

Q10
Stone/concrete/brick kerbs/edgings/channels

Clauses

2 To be read with preliminaries/general conditions.

Types of kerbs/edgings and channels

110A Proprietary precast concrete kerb

1. Description: Ref: **CK1**
2. Standard: To BS EN 1340.
3. Manufacturer: Charcon Aggregates Industries Ltd or equal approved.
   Hulland Ward, Ashbourne, Derbyshire
   DE6 3ET
   Tel. 01335 372222
   Email: landscaping@aggregate.com
4. - Product reference: Eco Countryside Kerb or equal approved
5. Recycled content: 75% (minimum) to BS EN ISO 14021
6. Designations: SQ Square
7. Size (width x height x length): 255mm x 145mm x 915mm
8. Finish: Exposed aggregate
9. Colour: Silver Grey
10. Bedding: To Engineer's Specification and Details
11. Joints generally: Narrow mortar
12. Sealant movement joints: N/A

111 Proprietary precast edging

1. Description: Ref: PK1
2. Standard: To BS EN 1340.
3. Manufacturer: Charcon Aggregates Industries Ltd or equal approved.
   Hulland Ward, Ashbourne, Derbyshire DE6 3ET
   Tel. 01335 372222
   Email: landscaping@aggregate.com
4. - Product reference: British Standard Edging
5. Recycled content: 75% (minimum) to BS EN ISO 14021
6. Designations: EF Edging, flat top, SQ square
7. Size (width x height x length): 150mm depth for laying flush & 200mm depth for laying as 25-50mm upstand edge
8. Special shapes: None
9. Finish: As supplied
10. Colour: Silver Grey
11. Bedding: To Engineer's Specification and Details
12. Joints generally: Narrow mortar
13. Sealant movement joints: N/A
14. Accessories: None

200B Metalwork edge

1. Description: SE1. Steel retaining edges to raised planters to Plot B frontage
2. Manufacturer: Everedge Ltd or equal approved
   Market Drayton
   Shropshire
   TF9 4WL
   Tel. 01453 731717
   Email: enquiries@everedge.co.uk
   2.1. Product reference: Halestem Flexible or equal approved
3. Size: 100mm height upstand. 4mm thick
4. Type/ Material: HST100F / Galvanised steel
   4.1. Finish: Standard
   4.2. Colour: Standard
5. Accessories: Anchor pins (5 no. per length, in accordance with manufacturer's recommendations)
6. Bedding: In accordance with manufacturer's recommendations
7. Joints: Butt jointed, interlocking units, in accordance with manufacturer's recommendations
8. Subject to detail and coordination with Architectural detailing.:

200C Metalwork edge (B)

1. Description: SE2 Bespoke Stainless steel edge to paving
2. Size: Fabrication drawings required for LA approval.
   Laid flush. 230mm maximum height X 4mm thick to retain paving within the RPZ of existing trees.
3. Type/ Material: HST100F / Galvanised steel
   3.1. Finish: Standard
   3.2. Colour: Standard
4. Accessories: Anchor pins (5 no. per length, in accordance with manufacturer's recommendations)
5. Bedding: In accordance with manufacturer's recommendations
6. Joints: Butt jointed, interlocking units, in accordance with manufacturer's recommendations
7. Laid as flush edge to finishes as edge restraint to paving to building façade and within RPA zones to achieve minimum footprint/depth impact on existing tree roots. Exact dimensions subject to detail,:

250 Material samples

1. Samples representative of colour and appearance of designated materials: Submit before placing orders.
   1.1. Designated materials: All stone edges, kerbs and channels

Roads/paving accessories/ marking/ demarcation - Not Used

Laying

510 Laying kerbs, edgings and channels

1. Cutting: Neat, accurate and without spalling. Form neat junctions.
   1.1. Long units (450 mm and over) minimum length after cutting: 300 mm.
   1.2. Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
2. Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.

3. Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 Adverse weather

1. Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

525 Foundations, haunching, bedding, etc.

1. In accordance with: Engineer'sdetails & specification, unless noted otherwise

530 Concrete for foundations, races and haunching

1. Standard: To BS 8500-2.
2. Designated mix: Not less than GEN0 or Standard mix ST1.
3. Workability: Very low.

540 Cement mortar bedding

1. General: To section Z21.
2. Mix (Portland cement:sand): 1:3.
    2.1. Portland cement: Class CEM I 42.5 to BS EN 197-1.
    2.2. Sand: to BS EN 12620, grade 0/4 or 0/2 (MP).
3. Bed thickness: 12-40 mm.

545 Proprietary bedding

1. Description: Trafficked blockwork
2. Manufacturer: To Engineer's Specification and Drawings
    2.1. Product reference: To Engineer's Specification and Drawings
3. Bed thickness: To Engineer's Specification and Drawings

547 Bedding/ Backing of units on fresh concrete races

1. Standard: To BS 7533-6.

555 Kerb & haunching dowels

1. In accordance with: Engineer'sdetails & specification, unless noted otherwise

570 Channels

1. Installation: To an even gradient, without ponding or backfall.
2. Lowest points of channels: 6 mm above drainage outlets.

580 Drainage channel systems

1. Installation: To an even gradient, without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washing and detritus: Safely disposed without discharging into sewers or watercourses.

590 Drainage channel systems with built in fall

1. Installation: Top of channels level, installed in correct sequence to form an even gradient without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.

3. Washings and detritus: Safely disposed without discharging into sewers or watercourses.

600 Radius kerbs/ channels

1. Usage: Radii of 15 m or less.

610 Angle kerbs

1. Usage: Internal and external 90° changes of direction.
2. Cutting of mitres: Not permitted.

620 Accuracy

1. Deviations (maximum)
    1.1. Level: ± 6 mm.
    1.2. Horizontal and vertical alignment: 3 mm in 3 m.

625 Regularity of paved surfaces

1. Maximum undulation of (non-tactile) paving surface: 3 mm.
    1.1. Method of measurement: Under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface).
2. Difference in level between adjacent units (maximum)
    2.1. Joints flush with the surface: Twice the joint width (with 5 mm max difference in level).
    2.2. Recessed, filled joints: 2 mm.
        2.2.1. Recess depth (maximum): 5 mm.
    2.3. Unfilled joints: 2 mm.
3. Sudden irregularities: Not permitted.

630 Narrow mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled, tightly butted and surplus mortar removed immediately.
    1.1. Joint width: 3 mm.

640 Tooled mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled and tooled to a neat flush profile.
    1.1. Joint width: 6 mm.

641 Tooled coloured mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled and raked out to a depth of 10 mm for pointing.
    1.1. Joint width: 6 mm.
2. Pointing: Joints refilled and tooled to a neat flush profile.
    2.1. Pointing mortar: 1:3 cement:sand.
    2.2. Pigment colour: Colour match to kerbs

650 Sealant movement joints

1. Joint filler: Compressible cellular rubber or plastics compatible with specified sealant.
2. Filler installation: Built in as work proceeds, extending through haunching and foundation. Filler positioned accurately to fully support sealant at the recommended depth below exposed faces of units.

3. Joint width: 6 mm
4. Sealant: Submit proposals
   4.1. Colour: Colour match to kerbs
5. Sealant application: As section Z22.

Ω End of Section

Q20
Granular sub-bases to roads/pavings

To be read with preliminaries/ general conditions.

110 Thicknesses of sub-base/ subgrade improvement layers

1. Thicknesses: See sections:
   1.1. Refer to Engineers Drawings and Specification for all road and paving makeups.

Ω End of Section

Q22
Asphalt roads/ pavings

Types of paving

140 Hot rolled asphalt Roads

1. Description: PT1. Hot rolled Asphalt to vehicle carriageway.
2. Standard: To BS EN 13108-4
3. Subgrade improvement layer: To engineers design and spec.
    3.1. Compacted thickness: To engineers design and spec.
4. Geotextile: To engineers design and spec.
    4.1. Manufacturer: To engineers design and spec.
        4.1.1. Product reference: To engineers design and spec.
5. Granular sub-base: To engineers design and spec.
    5.1. Compacted thickness: To engineers design and spec.
6. Base: To engineers design and spec.
    6.1. Paving grade: To engineers design and spec.
    6.2. Compacted thickness: To engineers design and spec.
7. Binder course: To engineers design and spec.
    7.1. Paving grade: To engineers design and spec.
    7.2. Compacted thickness: To engineers design and spec.

Preparatory work/ requirements

240 Acceptance of surfaces

1. Surface: Sound, clean and suitably close textured.
2. Level tolerances: To BS 594987.
3. Kerbs and edgings: Complete, adequately bedded and haunched and to the required levels.

Laying

320 Adverse weather

1. Frozen materials: Do not use.
2. Suspend laying
    2.1. During freezing conditions
    2.2. If the air temperature reaches 0°C, or in calm dry conditions -3°C, on a falling thermometer.
    2.3. Hot rolled asphalt: During periods of continuous or heavy rain or if there is standing water on the base.

330 Levels

1. Permissible deviation from the required levels, falls and cambers (maximum): In accordance with BS 594987, clause 5.2.

350 Contractor’s use of pavements

1. Before use
    1.1. Timing: allow newly laid sections to cool before trafficking.
    1.2. Open-grained surface: Fill with 0/4 mm size coated grit. Remove surplus.

1.3. Finish: Uncoated chipping and binder surface treatment.

2. Preparation for final surfacing
   2.1. Timing: Defer laying until as late as practicable.
   2.2. Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry.
   2.3. Adhesion:
      2.3.1. Application rate:
      2.3.2. Accuracy: Uniform, without puddles.
   2.4. Finishing: Allow emulsion to break completely before applying surface.

351 Contractor's use of pavements

1. Preparation for final surfacing
   1.1. Timing: Defer laying until as late as practicable.
   1.2. Immediately before laying final surfacing: Clean and make good the base/ binder course. Allow to dry.
   1.3. Adhesion:
      1.3.1. Application rate:
      1.3.2. Accuracy: Uniform, without puddles.
   1.4. Finishing: Allow emulsion to break completely before applying surface.

Completion - Not Used

Ω End of Section

Q22
Coated macadam/asphalt roads/pavings

Clauses

2 To be read with preliminaries/ general conditions.

Types of paving

99A Types of paving

1. Refer to engineer's specification and drawings

140 Hot rolled asphalt paving

1. Description: Refer to Engineers details.

Preparatory work/ requirements - Not Used

Laying - Not Used

Completion - Not Used

Ω End of Section

Q23
Gravel/ hoggin/ woodchip roads/ pavings

Clauses

2 To be read with preliminaries/ general conditions.

Types of surfacing

130A Proprietary self binding gravel

1. Description: Courtyard Surfaces
2. Subgrade improvement layer: To Engineer's Specification & Details
   2.1. Compacted thickness: To Engineer's Specification & Details
3. Geotextile: To Engineer's Specification & Details
   3.1. Manufacturer: To Engineer's Specification & Details
      3.1.1. Product reference: To Engineer's Specification & Details
4. Granular sub-base: To Engineer's Specification & Details
   4.1. Compacted thickness: To Engineer's Specification & Details
5. Surface course:
   5.1. Manufacturer:
6. Naturally occurring fine hoggin consisting of sand and gravel, with minimum clay content required to bind the material together, and with no large lumps of clay. E.g. Breedon Golden Amber Self Binding Gravel or equal approved.

   Available from: Breedon Group, Pinnacle House Breedon Quarry Breedon on the Hill Derby DE32 8AP Tel.
   01332 694000 -

   Size: Minimum of 85% by weight passing a 10 mm BS sieve. - Maximum particle size: 12 mm.
   - Compacted thickness: 100 mm.
   • Completion: Compact to produce a firm, regular surface, stable in use.
7. Application: Thoroughly mixed and uniformly spread.
   7.1. Spreading rate: To Supplier's recommendations, to achieve even consistent surface thickness and finish.
   7.2. Thickness: To manufacturers specification.
   7.3. Compaction to all layers: By heavy roller or other appropriate means, adequate to resist subsidence or deformation of the completed roads/ pavings when in use. Avoid damage to existing TPO tree roots.
8. Completion: Compact to produce a firm, regular surface, stable in use.

160A Loose gravel

1. Description: Margins to building facades
2. Subgrade improvement layer: Not required
   2.1. Compacted thickness: Not applicable
3. Geotextile: Placed below gravel margins e.g. at building facades, paths. Typically 300-500 mm wide. Refer to Details.
   - Manufacturer: TERRAM or equal approved
   Available from: Fiberweb Geosynthetics Ltd or equal approved
   Blackwater Trading Estate
   The Causeway

Maldon
Essex CM9 4GG
Tel: +44(0) 1621 874200
Fax: +44(0) 1621 874299
Email: info@terram.com

3.1. Product reference: Terram Weedguard or equal approved

4. Granular sub-base: Coarse graded aggregate for permeable paving, as Section Q20 **OR** refer to Engineer's specification for lcoations where land drains are required
   4.1. Compacted thickness: 100mm
5. Blinding to sub-base: Not required
6. Gravel: Loose laid and raked to uniform thickness.
   6.1. Type: Grey Limestone Aggregate
   6.2. Source: Available from CED Ltd or equal approved
   728 London Road, Thurrock, Grays, Essex RM20 3LU
   Tel. 01708 867237
   Email: enquiries@cedstone.co.uk
   Web: www.cedstone.co.uk
   6.3. Colour: Silver Grey
   6.4. Size: 10mm single size
   6.5. Thickness: Typically min. 150mm depth

190 FLEXIBLE POROUS BOUND GRAVEL FOR TREE PITS FLEXISTONE

1. Description: Product Reference: FlexiStone or equal approved Available from: KBI Ltd or equal approved: Netherton Mill Holdsworth Road Holmfield Halifax West Yorkshire HX3 6SN T: 01422 242880
2. Granular sub-base: To engineers spec
   2.1. Compacted thickness: To engineers spec
3. Blinding layer: Clean angular stone chippings to BS EN 13043, nominal size 20 mm.
   3.1. Thickness (minimum): 25 mm.
4. Base course
5. Surface course
   5.1. Slip/ skid resistance: Submit proposals
   5.2. Chippings: To BS EN 13043, nominal size 6 mm.
      5.2.1. Colour: UV Stable / Ref: Titanium, Contractor to submit sample for approval
   5.3. Application: In strict accordance with the supplier recommendations, appropriate for use within proposed tree pits.
6. Completion: Before handover, remove excess chippings.

270 Hard landscaping materials specification

1. Minimum 'BRE Green Guide to Specification Online' rating: B

Laying

310 Timber edging

1. Softwood board
   1.1. Size: 150 x 38 mm.
   1.2. Fixing: Galvanized nails into softwood pegs.
2. Softwood pegs

2.1. Size: 50 x 50 x 600 mm long
2.2. Fixing: Drive into ground.
2.3. Centres: 1200 mm, increasing to 600mm for radius section

3. Preservative treatment: Alkaline Copper Quaternary (ACQ)

315 Materials

1. Compatibility: Chippings suitable for use with respective binders/ emulsions/ resin/ epoxy.

320 Samples

1. Submit: Representative samples of Clause 130A Self Binding Gravel and 160 Clause Loose Gravel for approval prior to bulk ordering.

325 Blinding to sub-base

1. Type: To Engineer's requirements
2. Laying: Compact. Seal interstices. Provide free drainage.
3. Compacted thickness: To Engineer's requirements

340 Laying generally

1. Channels, gullies, etc: Keep clear.
2. Finished surfaces
   2.1. Lines and levels: To prevent ponding.
   2.2. Overall texture: Even.
   2.3. State at completion: Clean.

350 Cold weather working

1. Frozen materials: Do not use.
2. Freezing conditions: Do not lay pavings.
3. Cold bituminous surface dressings: Do not apply when ambient temperature is below 10°C.
4. Other dressings or overlays: As manufacturers' recommendations.

360 Drainage falls

1. Sealed surfaces
   1.1. Falls and cross falls (minimum): 1:40.
   1.2. Camber (minimum): 1:50.
2. Unsealed surfaces (minimum): 1:30.

370 Laying granular surfaces in vehicular areas

1. Permissible deviation from required levels, falls and cambers (maximum): ±20mm.
2. General: Spread and level in 150 mm maximum layers. As soon as possible compact each layer.
3. Dry weather: Lightly water layers during compaction.

380 Laying granular surfaces in pedestrian areas and cycle tracks

1. Permissible deviation from required levels, falls and cambers (maximum): ±12 mm.
2. General: Spread and level in 100 mm maximum layers. As soon as possible, compact each layer.
3. Dry weather: Lightly water layers during compaction.

390 Protection from traffic and plant

1. Paved areas: Restrict access to prevent damage.

Completion - Not Used

Ω End of Section

Q24
Interlocking brick/block roads/pavings

Clauses

2 To be read with preliminaries/ general conditions

Types of paving

110B Conventional concrete block paving for pedestrian paths

1. Description: PT2. Non-porous paving, pedestrian use Proprietary concrete block paving
2. Refer to Engineer's Specification and Details for all paving makeup requirements.
3. Blocks: To BS EN 1338.
    - 3.1. Manufacturer: Manufacturer: Charcon Ltd or equal approved Aggregate Industries, Hulland Ward, Ashbourne, Derbyshire DE6 3ET Tel. 01335 372222 Email: landscaping@aggregate.com. Product reference: Andover Textured.
        - 3.1.1. Product reference: Charcon Andover Textured or equal approved
    - 3.2. Sizes: 300x100x60mm depth laid staggered bond
    - 3.3. Special blocks: None required
    - 3.4. Colour/ Finish: Silver Fleck. Contractor to submit sample for approval
    - 3.5. Recycled content: 50% (minimum) to BS EN ISO 14021.
    - 3.6. Requirements:
        - 3.6.1. Freeze/ thaw resistance: Class 3
        - 3.6.2. Abrasion resistance: Class 3
        - 3.6.3. Slip/ Skid resistance: USRV greater than 40
4. Jointing:
    - 4.1. Material: In accordance with BS 7533-3.
    - 4.2. Joint width: 2-5 mm.
5. Sealer/ Stabilizer: Not required
6. Setting out:
    - 6.1. Bond: Stretcher, laying orientation to follow agreed strategy
    - 6.2. Features:
7. Accessories: None

110C Conventional concrete block paving for vehicle roads

1. Description: PT3. Non-porous paving, pedestrian use Proprietary concrete block paving
2. Refer to Engineer's Specification and Details for all paving makeup requirements.
3. Blocks: To BS EN 1338.
    - 3.1. Manufacturer: Manufacturer: Charcon Ltd or equal approved Aggregate Industries, Hulland Ward, Ashbourne, Derbyshire DE6 3ET Tel. 01335 372222 Email: landscaping@aggregate.com. Product reference: Andover Textured.
        - 3.1.1. Product reference: Charcon Andover Textured or equal approved
    - 3.2. Sizes: 300x100x80mm depth laid staggered bond
    - 3.3. Special blocks: None required
    - 3.4. Arrises: Pencil Chamfered Edge for carriageway use
    - 3.5. Colour/ Finish: Silver Fleck. Contractor to submit sample for approval

3.6. Recycled content: 50% (minimum) to BS EN ISO 14021.

3.7. Requirements:

3.7.1. Freeze/ thaw resistance: Class 3

3.7.2. Abrasion resistance: Class 3

3.7.3. Slip/ Skid resistance: USRV greater than 40

4. Jointing:

4.1. Material: In accordance with BS 7533-3.

4.2. Joint width: 2-5 mm.

5. Sealer/ Stabilizer: Not required

6. Setting out:

6.1. Bond: Herringbone

6.2. Features: None

7. Accessories: None

115 Permeable concrete block paving – total infiltration

1. Description: PT4. Porous paving, Shared/vehicular use Proprietary porous concrete block paving
2. Subgrade improvement layer: To Engineer's Details and Specification

2.1. Compacted thickness: To Engineer's Details and Specification

3. Geotextile below granular sub-base: To Engineer's Details and Specification
4. Granular sub-base: To Engineer's Details and Specification

4.1. Compacted thickness: To Engineer's Details and Specification

5. Geotextile below laying course
6. Laying course

6.1. Compaction: In accordance with BS 7533-3. Determine by trial the depth of loose bedding material needed to ensure specified bedding course thickness after final compaction of paving.

7. Blocks: To BS EN 1338.

7.1. Manufacturer: Charcon Ltd or equal approved
Aggregate Industries, Hulland Ward, Ashbourne, Derbyshire DE6 3ET Tel. 01335 372222
Email: landscaping@aggregate.com. Product reference: Andover Textured Infilta.

7.1.1. Product reference: High quality porous concrete block, Colour Silver Fleck

7.2. Sizes: 200x100x80mm depth laid herringbone

7.3. Special blocks: None

7.4. Spacer nibs: Required, e.g. 5mm.

7.5. Arrises: Pencil Chamfer.

7.6. Colour/ Finish: Light Grey, Contractor to submit sample for approval

7.7. Recycled content: : 50% (minimum) to BS EN ISO 14021

7.8. Requirements:

7.8.1. Freeze/ thaw resistance: Class 2

7.8.2. Abrasion resistance: : Class 3.

7.8.3. Slip/ Skid resistance: PTV to BS 7976-2 of 4

8. Jointing

8.1. Material: Single size 5 mm washed aggregate.

8.2. Joint width: 6 mm or as supplier recommendations

8.3. Conventional sand jointing: To Engineers Requirements.

9. Setting out
    9.1. Bond: Staggered stretcher bond with double stretcher course around perimeter / Laid 90 deg Herringbone to trafficked areas.
    9.2. Features: none
10. Accessories: none

160 Hard landscaping materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: B

Execution

200 Execution generally – concrete block and clay paver paving

1. Standard: In accordance with BS 7533-3.

220 Samples

1. General: Before ordering, submit samples of all blocks/ pavers/ setts that are representative of colour and appearance.

230 Control samples

1. General: Carry out sample area of finished work:
    1.1. Location: TBC
    1.2. Size (minimum): 3.0 x 3.0m
    1.3. Features to be included: - Channel;
    - Edging;
    - Kerb;
    - Recessed manhole cover infill;
    - Junction with building facade; and
    - Cutting to base of light column
2. Give notice: When ready for inspection.
3. Timing: Obtain approval of appearance before proceeding.

240 Adverse weather

1. General: Do not use frozen materials or lay bedding on frozen or frost covered sub-bases.

325 Drainage holes in existing bases

1. Location: Impervious layers of existing road/ paving.
2. Drainage: Form regular grid of holes, through base and any additional build up, down to sub-base:
    2.1. Spacing in both directions: To Engineer's Details and Specification
    2.2. Minimum clear opening: To Engineer's Details and Specification
    2.3. Do not weaken or excessively disturb road/ paving.
3. Completion
    3.1. Remove jagged or protruding edges.
    3.2. Fill holes with To Engineer's Details and Specification. Ram down to form flush smooth surface.

335 Planing and repairs to existing bases

1. Existing macadam/ asphalt surfaces: Plane to required levels.
2. Repairs: To Engineer's Details and Specification.

3. Building up to required levels: To Engineer's Details and Specification

350 Granular layer over existing bases

1. Material: To Engineer's Details and Specification
2. Thickness: To Engineer's Details and Specification
3. Compaction: To Engineer's Details and Specification
4. Blinding: To Engineer's Details and Specification

485 Laying blocks/ pavers/ setts

1. Setting out: Start from an edge restraint.
2. Cutting: Cleanly, accurately and vertically, without spalling. Do not mark or damage visible surfaces.
3. Cut edges: Turn inwards where possible; do not position against edge restraints or other features.
4. In situ mortar or concrete infill: Do not use
5. Compaction: Vibrate to produce thoroughly interlocked paving of even overall appearance with regular joints and accurate to line, level and profile. Do not mark or damage paving units, kerbs and adjacent work.
    5.1. Concrete blocks and clay pavers: In accordance with BS 7533-3, Annex F, to site category required for laying course material.

490 Laying permeable paving

1. General: In strict accordance with manufacturer's recommendations

495 In situ surrounds to obstructions

1. Locations: Around circular drainage fittings
2. Material: C35 air entrainand concrete in accordance with BS 7533-3, clause 5.4.3.2.
3. Shape and size: Rectangular, 100 mm (minimum) all round obstruction.
4. Thickness (minimum): Combined depth of blocks/ pavers/ setts and sand laying course.
5. Colour: To match paving units
6. Timing: Lay and allow to cure in advance of laying blocks/ pavers/ setts.

505 Regularity of paved surfaces

1. Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
2. Joints between paving units or utility access covers
    2.1. Joints flush with the surface: difference in level between adjacent units to be no more than twice the joint width (with a 5 mm max difference in level).
    2.2. Recessed, filled joints: difference in level between adjacent units to be no greater than 2 mm; the recess to be no deeper than 5 mm.
    2.3. Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.
3. Sudden irregularities: Not permitted.

Completion

615 Completion of paving

1. Final compaction of the surface course: In accordance with BS 7533-3.
2. Vacuum cleaning machines: Not allowed.

620 Slip resistance testing

1. Surfaces to be tested: All block paving
    1.1. Surface condition: Dry and wet
2. Timing: As agreed with contract administrator
3. Period of notice (minimum): 3 working days.
4. Test standard: To BS 7976-2
    4.1. Testing authority: A UKAS accredited laboratory
    4.2. Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Contract administrator.
    4.3. Report: Submit.
        4.3.1. Format: As required under BS 7976-2

Ω End of Section

Q25
Slab/brick/sett/cobble pavings

Clauses

2 To be read with preliminaries/ general conditions.

Natural stone paving selection criteria - Not Used

General

20 Manhole/inspection/service covers

1. Recessed manhole covers infilled with paving to match adjacent to be used wherever possible:
2. Manhole covers, inspection covers, service covers, etc., to align with paving bond wherever possible
3. Where covers cannot be aligned with paving coursing, single paving units should be cut neatly without small infill pieces
4. Adjacent/nearby covers to align with one another
5. Covers to be positioned so as to avoid overlap with proposed kerb alignment
6. Contractor to notify: Landscape Architect/CA of any manhole covers that cannot achieve the criteria set out above and agree an alternative solution before commencing paving in the affected area(s).

30 Recessed covers

1. Location: WHERE POSSIBLE / APPROVED BY UTILITY PROVIDER
2. Paving within recessed covers to be laid so as to achieve a seamless transition/continuation of the surrounding paving
    2.1. Paving materials to match surrounding paving
    2.2. Coursing to align and continue through/across full extent of recessed cover
    2.3. Transverse joints to align with joints in adjacent paving, i.e. a cut paving unit should appear 'whole', with all edges cut by the recessed cover continuing through to meet and form a corner
    2.4. Additional transverse joints to be provided, as required, to reflect the adjacent paving appearance/grain
3. Recessed cover to be aligned with paving, i.e. parallel/orthogonal to coursing
4. Paving to be cut neatly around lifting key holes, etc.
5. Narrow slivers of paving to be avoided

40 Core drilling

1. Paving units to be neatly core drilled on site to allow for installation of circular bases/fixings/posts to street furniture elements, for example (but not limited to):
    1.1. cycle stands
    1.2. lighting columns
    1.3. sign posts
    1.4. traffic control posts
    1.5. bench bases
    1.6. socket cores
    1.7. litter bins

2. Concrete infill to be avoided
3. Excessively wide mortar joints and/or patching to be avoided

50 Materials & workmanship

1. Paving to be cut neatly
2. Narrow slivers and/or small infill pieces to be avoided
3. Joints to be regular, tight and even, unless specified otherwise
4. Bonds to courses to be correctly staggered
5. Setts to be laid perpendicular to carriageway direction and kerbs, unless indicated otherwise
6. Excessively wide mortar joints and/or patching around service covers to be avoided
7. Refer to: drawingsfor further details/requirements

Paving systems - Not Used

System performance - Not Used

Products - Not Used

Paving accessories

520 Corduroy paving stips

1. Description: PT8 Corduroy strips for block paving units
2. Location: Top and bottom of steps
3. Supplier/Manufacturer: Urban finish. sales@urbanfinish.com or equal approved
   3.1. Product Reference: Corduroy strips for block paving units
4. Material: Stainless Steel, Satin Finish
5. Method of Fixing: To manufactures design and spec.
6. Sample: Submit to: for approval

520B Corduroy paving Strips

1. Description: Proprietary Stainless Steel Corduroy strips
2. Location: Refer to Drawings (Hard Landscape General Arrangement
3. Supplier/Manufacturer: Urban finish. sales@urbanfinish.com or equal approved
   3.1. Product Reference: Stainless Steel Corduroy strips
4. Material: Stainless Steel, Satin Finish
5. Method of Fixing: In accordance with supplier's recommendations
6. Sample: Submit to: Submit to Landscape Architect for approval
7. Additional Requirements:
   7.1. Compliant with the Department for the Environment, Transport and the Regions (DETR): Guidance on the Use of Tactile Paving Surfaces DETR 1998 & BS7997:2003

Execution

610 Material samples

1. Samples representative of colour and appearance of designated materials: Submit before placing orders.
   1.1. Designated materials: Refer to Samples Requirements, Clause A15/231

615 Control samples

1. Sample areas: Complete as part of the finished work.
    1.1. Types of paving: Clause 520 & 520B tactile items
    1.2. Location: TBA, in situ
    1.3. Size (minimum): 800mm x 800mm
    1.4. Included features: final spacing/positioning and fixing
2. Approval of appearance and surface: Obtain before proceeding.

620 Adverse weather

1. General
    1.1. Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a rising thermometer.
    1.2. Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases.
2. Paving with mortar joints and/ or bedding
    2.1. Protect from frost damage, rapid drying out and saturation until mortar has hardened.
3. Paving laid and jointed in sand:
    3.1. Stockpiled bedding sand: Protect from saturation.
    3.2. Exposed areas of sand bedding and uncompacted areas of sand bedded paving: Protect from heavy rainfall.
    3.3. Saturated sand bedding: Remove and replace, or allow to dry before proceeding.
    3.4. Laying dry-sand jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.

625 Laying pavings – general

1. Appearance: Smooth and even with regular joints and accurate to line, level and profile.
2. Falls: To prevent ponding.
3. Bedding of paving units: Firm so that rocking or subsidence does not occur or develop.
    3.1. Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units.
4. Slopes: Lay paving units upwards from the bottom of slopes.
5. Paving units: Free of mortar and sand stains.
6. Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.

630 Levels of paving

1. Permissible deviation from specified levels
    1.1. Generally: ± 6 mm.
2. Height of finished paving above features
    2.1. At gullies: +6 to +10 mm.
    2.2. At drainage channels and kerbs: +3 to +6 mm.

637 Regularity of paved surfaces

1. Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
2. Joints between paving units or utility access covers

2.1. Joints flush with the surface: difference in level between adjacent units to be no more than twice the joint width (with a 5 mm max difference in level).

2.2. Recessed, filled joints: difference in level between adjacent units to be no greater than 2 mm; the recess to be no deeper than 5 mm.

2.3. Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.

3. Sudden irregularities: Not permitted.

645 Protection

1. Cleanliness: Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
2. Materials storage: Do not overload pavings with stacks of materials.
3. Handling: Do not damage paving unit corners, arrises, or previously laid paving.
4. Mortar bedded pavings: Keep free from traffic after laying:

4.1. Pedestrian traffic (minimum): 4 Days

4.2. Vehicular traffic (minimum): 10 days

5. Access: Restrict access to paved areas to prevent damage from site traffic and plant.

650 Cementitious bases and sub-bases

1. General: Protect from moisture loss, if not covered by another pavement course within 2 hours of completion.

655 Condition of sub-bases/ bases before spreading laying course

1. Trenches and excavation of soft or loose spots in subgrade: Fill and thoroughly compact.
2. Granular surfaces: Lay and compact so as to be sound, clean, smooth and close-textured enough to prevent migration of bedding/ laying course materials into the sub-base during compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose material.
3. Prepared existing and new bound bases (roadbases): Sound, clean, free from rutting or major cracking. Remove sharp stones, projections and debris.
4. Sub-base/ Roadbase level tolerances: To BS 7533-7, Annex A.
5. Levels and falls: Accurate and within the specified tolerances.
6. Drainage outlets: Within 0-10 mm of the required finished level.
7. Features in sand bedded paving (including mortar bedded restraints and drainage ironwork): Complete to required levels; adequately bed and haunch in mortar.
8. Sub-bases containing cement/ hydraulic binder: Cure for minimum times specified in BS 7533-4.

660 Drainage holes in existing bases

1. Location: Impervious layers of existing road/ paving.
2. Drainage: Form regular grid of holes, through base and any additional build up, down to sub-base:

2.1. Spacing in both directions: To Engineer's specificatoin and details

2.2. Minimum clear opening: To Engineer's specificatoin and details

2.3. Do not weaken or excessively disturb road/ paving.

3. Completion: Remove jagged or protruding edges. Fill voids with To Engineer's specificatoin and details Ram down to form flush smooth surface.

661 Drainage holes in existing bases

1. In accordance with: Engineer's drawings & specification

667 Planing and repairs to existing bases

1. In accordance with: Engineer's details & specification

676 Laying geotextile sheet edging strips

1. In accordance with: Engineer's details & specification

Completion

915 Completion of paving with dry sand or fine aggregate filled joints

1. Sand dressing: Leave a thin layer of dry jointing sand/ fine aggregate over the paving, sweep clean before practical completion
2. Final compaction of the surface course: In accordance with BS 7533-3.
3. Vacuum cleaning machines: Not allowed.

930 Slip resistance testing

1. Surfaces to be tested: Clause 315A Concrete Slab Paving
    1.1. Surface condition: Dry and wet
2. Timing: As agreed with contract administrator
3. Period of notice (minimum): 3 working days.
4. Test standard: To BS 7976-2
    4.1. Testing authority: A UKAS accredited laboratory
    4.2. Witnessing/ Certification: Arrange for tests to be witnessed/ certified by: Contract administrator.
    4.3. Report: Submit.
        4.3.1. Format: As required under BS 7976

Ω End of Section

Q26
Special surfacings/ pavings for sport/ general amenity

Clauses

2 To be read with preliminaries/ general conditions.

Sports surfacing

140 Surface gradients, evenness and flatness

1. Surface regularity: As specified by BS 7044-4.
2. Deviation from the finished plane: When checked on a 10 m grid the difference in level between adjacent grid points, after taking design gradients into account, must not exceed ±6 mm.
3. Profile: Refer to Finished Levels General Arrangement
4. Gradients: Refer to Finished Levels General Arrangement

150 Suitability of base/ sub-base

1. Preparation: Before starting work ensure the following:
    1.1. Accuracy: Base/ sub-base will permit specified flatness/ regularity of finished surfacing.
    1.2. Falls/ camber: Accurately incorporated in the base/ sub-base.

Impact attenuating surfacings for play areas

300 Extent of impact attenuating surfacing

1. General: Lay to the impact areas shown in the relevant parts of BS EN 1176.

301 Extent of impact absorbing surfacing

1. General: Lay impact absorbing surfacing as indicated on drawings.

360 In situ synthetic surfacing

1. Sub-base: To Engineer's Details and Specification
    1.1. Thickness: To Engineer's Details and Specification. Note that within the RPZ of existing tree, bespoke footing solutions may be required. Contractor to seek advice from Arboricultural Consultant and investigate existing subbase
2. Base: In accordance with supplier's recommendations
    2.1. Thickness: In accordance with supplier's recommendations. Note that winthin the RPZ of existing tree, bespoke footing solutions may be required. Contractor to seek advice from Arboricultural and investigate existing subbase
3. Surface course: Wet pour, in situ laid polyurethane bound EPDM rubber crumb surface.
    3.1. Standard: To BS 7188.
    3.2. Manufacturer: Playtop Safety Surfacing Ltd or equal approved Tel. 01332 287418 Email: sales@playtop.co.uk
        3.2.1. Product reference: Playtop Safer Surface or equal approved; porous rubber crumb.
    3.3. Colour: JKL: Beige / FGHI: Rainbow Green. Contractor to submit sample for approval
    3.4. Critical fall height when tested to BS EN 1177: Varies. Refer also to Q52 for individual play equipment. Critical fall heights to be confirmed with each individual play equipment product supplier. Depth of play surface to be applied in strict accordance with supplier's recommendations to suit critical fall height requirements.
    3.5. Health and safety

3.5.1. Substance known to be toxic or carcinogenic on skin contact or released as vapour or dust during normal use: Not permitted.

4. Submit
   4.1. Resistance to abrasive wear, slip resistance, resistance to indentation and ease of ignition: Evidence of testing to BS 7188.
   4.2. Critical fall height: Evidence of testing to BS EN 1177.

Associated accessories - Not Used

Execution - Not Used

Completion

910 Sports surface testing

1. Standard: To BS EN 1177 and BS 7188, where applicable
2. Testing body: A United Kingdom Accreditation Service (UKAS) independent laboratory.
3. Timing: Within ten days of completing the surfacing works.
4. Test results: Submit.

930 Documentation

1. General: For all types of surfacing, provide the following:
   1.1. Name and contact details of installer.
   1.2. Date of installation.
   1.3. Name and contact details of manufacturer.
   1.4. Type/ description/ reference of products used.
   1.5. Manufacturer's recommended inspection and maintenance procedures to maintain safety and impact absorbing performance.
   1.6. Manufacturer's recommended cleaning and maintenance methods, where relevant.
2. Manufacturer's recommended cleaning and maintenance methods, where relevant.

940 Labelling

1. Signs: Provide permanent labelling in approved locations on all types of surfacing stating: Critical fall height; - Date of installation; - Manufacturer's name and contact details; and - Product name.

Ω End of Section

Q28
Topsoil and growing media

Clauses - Not Used

To be read with preliminaries/ general conditions.

2A To be read with preliminaries/ general conditions.

1. NOTE SOILING WITHIN THE LANDSCAPE SPECIFICATION RELATES SOLELY TO THE HORTICULTURAL GROWING MEDIA REQUIRED TO SUPPORT THE PHASE 3A & 3B LANDSCAPE PROPOSALS.

5 Section index

General

10 Reference documents

1. BS1377-1:2016: *Methods of test for soils for civil engineering purposes. General requirements and sample preparation.*
2. BS 1377 (Parts 2 - 9):1990: *Methods of test for soils for civil engineering purposes*
3. BS3882:2015: *Specification for topsoil*
4. BS4428:1989: *Code of practice for general landscape operations (excluding hard surfaces)*
5. BS5930:2015: *Code of practice for ground investigations*
6. BS6031:2009: *Code of practice for earthworks*
7. BS8000-0:2014: *Workmanship on building sites. Introduction & general principles.*
8. BS8000-1:1989: *Workmanship on building sites. Code of practice for excavating and filling*.
9. PD CR 13455:1999: *Soil improvers and growing media. Guidelines for the safety of users, the environment and plants.*

20 Groundworks generally

1. All groundworks to be carried out in accordance with the British Standards and guidelines listed above, unless specified otherwise hereafter.

40 Ongoing/previous work packages

1. Copies of package specifications, record drawings/as built surveys and photographic records of works in progress shall be available from: CA

50 Topsoil placement operations - acceptance of formation levels & subsoil placement

1. Prior to commencing fine grading, the: Landscape Contractorshall inspect/check the formation levels and be satisfied with the works before acceptance.
2. Written reason must be given immediately to the: CAif any formation levels placed by others are considered unsatisfactory.
3. The: Landscape Contractoris deemed to have inspected, accepted and approved the subsoil placement on commencement of topsoil placement operations.

55 Topsoil placement operations

1. The topsoil placement, preparation and amelioration works shall include the following:
    1.1. Fine grading of formation levels (top of subsoil levels), including any necessary adjustments, to achieve the specified finished levels with the topsoil depths prescribed
    1.2. Removal of weeds/vegetation from surfaces awaiting topsoiling, and/or within topsoil stockpiles
    1.3. Spreading, levelling, stone removal and light consolidation of site topsoil
    1.4. Supply, spreading, levelling and light consolidation of imported topsoil, if/where necessary
    1.5. Supply, placement and incorporation of all soil ameliorants required
    1.6. Final adjustments to achieve specified finished ground profiles

60 Bulking

1. The Contractor's attention is drawn to the fact that any measurements of excavation, and/or subsequent disposal, are net measured.
2. Therefore, the Contractor's price should allow for both an increase in bulk and for transportation of excavated material to and from temporary heaps, as may be necessary.
3. The Contractor shall make allowance in placing for settlement in order to achieve (after settlement) the depths/levels as specified.

70 Subsoil & topsoil storage

1. Refer to relevant clauses within Section: **D20** of this specification.

80 Contamination

1. General: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
    1.1. Corrosive, explosive or flammable.
    1.2. Hazardous to human or animal life.
    1.3. Detrimental to healthy plant growth.
2. Subsoil: In areas to receive topsoil, do not use subsoil contaminated with the above materials.
3. Give notice: If any evidence or symptoms of soil contamination are discovered on the site, or in topsoil to be imported.

System outline

125 Green roof growing media system

1. Description: Refer to proprietary product data sheets in Appendices (Bauder or equal approved) and relevant Architectural Specifications

145 Planting pit backfilling topsoil system for tree pits

1. Description:
2. Composition
   2.1. Topsoil: Imported topsoil to BS 3882 / proprietary urban tree soil for trees in hard landscape
   2.2. Ameliorants: To Clauses 400-420
   2.3. Accessories: Mycorrhizal inoculant to bare root stock

155 Mulching and top dressing system

1. Description: FOR SHRUB BEDS
2. Composition
   2.1. Material: Ornamental Bark Mulch

Existing site topsoil

201D Reuse of site-won topsoil and requirement for imported topsoil

1. Preliminary site investigations: have indicated that there will be insufficient suitable existing site topsoil available to complete the proposed soft landscape works
2. Therefore, any shortfall in suitable existing site topsoil for use within soft landscape areas, as shown: , shall be made up using imported topsoil in accordance with Section **Q28** of this specification
3. The Contractor is responsible for ascertaining accurate quantities of both existing site topsoil and imported topsoil necessary for the execution of the works
   3.1. Quantities to be confirmed, and agreed, with the: at Tenderstage
4. Any deficiency in suitable existing site topsoil (as agreed at: stage) shall be imported by the Contractor to fulfil the requirements of the Contract
5. Any deficiency in topsoil supply (additional to that agreed at: stage) shall be imported by the Contractor at no additional cost to the Contract
6. All imported topsoil to be in accordance with the relevant clauses of Section: **Q28** of this specification
7. Refer to: for requirements for amelioration of existing site topsoil to be reused
8. Refer also to relevant clauses in Section: **D20** of this specification

205 Reuse of site-won topsoil

1. Refer to relevant clauses of Section: **D20** of this specification for requirements relating to the preparation, stripping, treating, handling & storing of site-won topsoil

270 Site investigation

1. Report: See section: D20 and refer to Geotechnical Engineer's information (available from CA

280A Chemical & physical analysis of existing site topsoil

1. A chemical, horticultural and physical analysis of the existing site topsoil will be required in order to establish its suitability for reuse as a planting medium within the Contract Works.
2. Soil to be analysed: Representative samples from across entire site
   2.1. Spacing/Distribution:
3. Soil analyst: Tim O'Hare Associates, or equivalent & approved
4. Tim O'Hare Associates
5. Howberry Park
6. Wallingford

7. Oxfordshire
8. OX10 8BA
9. **T**: 01491 822653
10. **W**: www.timohare-associates.com
    10.1. Test laboratory to be accredited to BS EN IS/IEC 17025 by a recognised national or international accreditation body.
11. Samples: Collect in accordance with BS 3882
12. Testing/Analysis: To be in accordance with BS3882
13. Submit:
    13.1. Declaration of analysis:
    13.2. Visual description
    13.3. Soil texture
    13.4. Particle size (clay/silt/sand) analysis
    13.5. Stone/coarse fragment content by % weight (>2mm, >20mm, >50mm)
    13.6. pH value
    13.7. Electrical conductivity (1:2.5 soil/water extract)
    13.8. Total nitrogen (N) and carbon:nitrogen (C:N) ratio
    13.9. Extractable phosphorus (P), potassium (K) & magnesium (Mg)
    13.10. Microbial activity
    13.11. Mass loss on ignition/organic content
    13.12. Potentially phytotoxic contaminants - zinc (Zn), copper (Cu) & nickel (Ni)
    13.13. Zootoxic contaminants - Refer to BS3882 for guidance
    13.14. Evidence of physical contaminans or sharps
    13.15. Evidence of pernicious weeds
    13.16. Depth of topsoil at each survey location
    13.17. Soil Survey Plan clearly showing test sample locations and their corresponding reference numbers in: format
14. The results of the analysis should be presented in an interpretative report, to include the following:
    14.1. Assessment of the topsoil's suitability for reuse within the proposed scheme, e.g. as a topsoil/planting medium, as a component within a manufactured topsoil, and/or as subsoil
    14.2. Recommendations for treatment and/or additives to ameliorate the site-won topsoil to suit its intended use, to provide a growing medium that will optimise future plant establishmnent for each planting typology proposed, e.g. tree pits, formal hedgerows, native hedge/scrub planting, ornamental shrub planting, wildflower meadows, amenity grass/lawns, marginal/aquatic planting, etc..
    14.3. Assessment of quantity/depth of in situ site topsoil suitable for reuse, including a clear plan indicating location and corresponding depths
    14.4. Assessment of soil permeability and general site drainage conditions
    14.5. Certificate of analysis (clearly dated and referencing site/sample(s))
15. The assessment should take account of the specific demands/requirements of the scheme, i.e. the end user and their potential level of contact with the soil, planting character/species, etc..
16. The completed report and test results should be provided as a digital data file with an accompanying hard copy.
    16.1. The Soil Survey Plan should be provided in AutoCAD format - a clear and accurate system of AutoCAD layering should be developed whin producing the survey.
17. Additional Requirements: Refer to Geotechnical Engineer's report and Asbestos Investigation findings prior to commencing work.

285A Chemical & physical analysis of existing site subsoil

1. A chemical, horticultural and physical analysis of the existing site subsoil will be required in order to establish its suitability for reuse within the Contract Works.
2. Soil to be analysed: Representative samples from across entire site
   2.1. Spacing/Distribution: Submit proposals
3. Soil analyst: Tim O'Hare Associates, or equivalent & approved
4. Tim O'Hare Associates
5. Howberry Park
6. Wallingford
7. Oxfordshire
8. OX10 8BA
9. **T**: 01491 822653
10. **W**: www.timohare-associates.com
    10.1. Test laboratory to be accreddited to BS EN ISO/IEC 17025 by a recognised national or international accreditation body.
11. Samples: Collect in accordance with BS8601
12. Testing/Analysis: In accordance with BS8601
13. Submit:
    13.1. Declaration of analysis:
    13.2. Visual description
    13.3. Soil texture
    13.4. Particle size (clay/silt/sand) analysis
    13.5. Stone/coarse fragment content by % weight (>2mm, >20mm, >50mm)
    13.6. pH value
    13.7. Electrical conductivity
    13.8. Exchangeable sodium percentage (ESP), if applicable
    13.9. Carbonate content (%)
    13.10. Mass loss on ignition/organic content
    13.11. Potentially phytotoxic contaminants - zinc (Zn), copper (Cu) & nickel (Ni)
    13.12. Zootoxic contaminants - Refer to BS3882 for guidance
    13.13. Evidence of physical contaminans or sharps
    13.14. Evidence of pernicious weeds
    13.15. Depth of subsoil at each survey location
    13.16. Soil Survey Plan clearly showing test sample locations and their corresponding reference numbers in: Dwg & PDFformat
14. The results of the analysis should be presented in an interpretative report, to include the following:
    14.1. Assessment of the soil's suitability for reuse within the proposed scheme, e.g. as a component within a manufactured topsoil and/or as subsoil
    14.2. Recommendations for treatment and/or additives to ameliorate the site-won subsoil to suit its intended use
    14.3. Assessment of quantity/depth of in situ site subsoil suitable for reuse, including a clear plan indicating location and corresponding depths
    14.4. Assessment of soil permeability and general site drainage conditions
    14.5. Certificate of analysis (clearly dated and referencing site/sample(s))

15. The assessment should take account of the specific demands/requirements of the scheme, i.e. the end user and their potential level of contact with the soil, planting character/species, etc..
16. The completed report and test results should be provided as a digital data file with an accompanying hard copy.
    16.1. The Soil Survey Plan should be provided in AutoCAD format - a clear and accurate system of AutoCAD layering should be developed whin producing the survey.
17. Testing/Analysis: To be in accordance with BS3882
18. Additional Requirements: Refer to Geotechnical Engineer's report and Asbestos Investigation findings prior to commencing work.

Products - Not Used

Imported topsoil

300 Preparation materials generally

1. Purity: Free of pests and disease.
2. Foreign matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation, and the like.
3. Contamination: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
    3.1. Corrosive, explosive or flammable.
    3.2. Hazardous to human or animal life.
    3.3. Detrimental to healthy plant growth.
4. Subsoil: In areas to receive topsoil or planting media, do not use subsoil contaminated with the above materials.
5. Objectionable odour: None.
6. Give notice: If any evidence or symptoms of soil contamination are discovered on the site or in topsoil or planting media to be imported.

310 Materials not permitted

1. Materials: - Peat;
   - Products containing peat; and
   - River and canal dredgings.

325 Imported topsoil - general requirements

1. Full written analysis of any proposed imported topsoil will be required by the: CA/Landscape Architectfor approval before soil is transported to site, including the following:
    1.1. A report on the suitability of the proposed topsoil for its intended use, taking account of the different planting typologies, end user, etc.
    1.2. Recommendations for amelioration of the proposed topsoil based on its intended use, taking account of the different planting typologies, etc.
2. Sources of topsoil are to be identified, the preference is for local virgin soils.
3. Screened/manufactured soils without full and detailed analysis, origin history and samples will not be approved.
4. The written analysis must include a report on the suitability of the proposed topsoil for its intended use.
5. Before an order is placed for imported topsoil, the: CA/Landscape Architectshall give written approval of 5m³ sample load delivered to site.
6. Any topsoil brought onto the site without approval will be deemed to have been brought in at the Contractor’s risk, and if instructed to cart such topsoil off site, this will be at the Contractor’s expense.

7. All imported topsoil to be in accordance with BS3882
8. All imported topsoil to comply with the following threshold limits for levels of phytotoxic contaminants (by soil pH) (mg/kg dry solids) (Nitric acid extractable):
9. **pH<6.0 pH6.0-7.0 pH>7.0**
10. Nickel (total) <60 <75 <110
11. Zinc (total) <200 <200 <300
12. Copper <100 <135 <200
13. All imported topsoil to comply with current safe threshold limits for toxic elements, including, but not limited to, the following:
    13.1. Arsenic
    13.2. Cadmium
    13.3. Chromium
    13.4. Lead (total)
    13.5. Mercury (total)
    13.6. Selenium
    13.7. Nickel
    13.8. Boron (water soluble)
    13.9. Copper (total)
    13.10. Phenols
    13.11. Free Cyanide
    13.12. Complex Cyanides
    13.13. Thiocyanate
    13.14. Sulphate
    13.15. Sulphide
14. It is the Soil Testing Laboratory's responsibility to consider appropriate threshold limits for any contaminants/toxic elements present in the topsoil, both individually and in combination, and assess the topsoil's suitability for safe use within: Domestic Residential Gardens
15. The Contractor/Soil Testing Laboratory is responsible for ensuring that the concentrations of contaminants within the topsoil does not exceed those permitted by UK legislation (current at the time at which the topsoil is supplied) and shall confirm this in writing prior to the soil's delivery to site.
16. All imported topsoil to be free of contamination, e.g. weed seeds, roots of perennial weeds, sticks, subsoil and/or other foreign matter.

Topsoil additives, ameliorants, composts, etc.

361 Compost

1. Description: For all plant beds and topsoiled tree pits
2. Standard: In accordance with PAS 100.
3. Source: Amenity Land Services, or equivalent & approved
4. Amenity Land Services
5. Allscott Park
6. Allscott
7. Telford
8. Shropshire
9. TF6 5DY
10. T: 01902 255036

11. W: www.amenity.co.uk .
    11.1. Product reference: TPMC - Premier bio-organic tree & shrub planting compost
12. Horticultural parameters:
    12.1. pH (1:5 water extract): 7.0 - 8.7
    12.2. Electrical conductivity (maximum, 1:5 water extract): 200mS/m.
    12.3. Moisture content (m/m of fresh weight): 35-55%.
    12.4. Organic matter content (minimum): 25%.
    12.5. Grading (air dried samples): 99% passing 25 mm screen, and 90% passing: 10mm screen mesh apeture
    12.6. Carbon:Nitrogen ratio (maximum): 20:1.
13. Texture: Friable.
14. Objectionable odour: None.
15. Compost Certification Scheme certification: Required
16. Declaration of analysis: Submit.
17. Additional analyses: Not required
18. Samples: Supply 5 kg sample before ordering

390 Soil conditioner

1. Source: Alginure Products Ltd or equal approved
   Bells Yew Green
   Tunbridge Wells
   Kent TN3 9BQ
   Tel. 01892 750 664
   1.1. Product reference: Seanure Seaweed Soil Builder
2. Description: A natural seaweed soil conditioner that builds soil structure, enhances water retention and improves plant health & resistance

393 Compost additive

1. Source: J Arthur Bowers or equal approved
   Firth Road
   Lincoln LN6 7AH
   1.1. Product reference: Perlite
2. Description: Lightweight microporous granules used to improve aeration & drainage

395 Peat

1. Peat or products containing peat: Do not use.

Fertilizers

400 Organic fertilizer

1. Source: Organico Limited, or equivalent & approved
2. Organico Limited
3. Owen St
4. Coalville
5. Leicestershire
6. LE67 3DE
7. **T**: 01530 510060
8. **W**: www.6-x.co.uk

8.1. Product reference: 6X Easy Spread Pellets
9. Description: Organic, odourless pelleted chicken manure
10. Nutrient Content:
    10.1. Nitrogen (N): 5%
    10.2. Phosphorus (P): 3.3%
    10.3. Potassium (K): 2.2%
11. pH: 6.5-7.0

410 Slow release fertilizer

1. Supplier: Submit proposals
2. Manufacturer: ICL UK
3. Epsilon house
4. West Road
5. Ipswich
6. IP3 9FJ
7. **T**: 01473 237100
8. **E**: prof.sales@icl.group.com
9. **W**: www.icl-sf.com/uk-en/
    9.1. Product reference: Ficote Total 12-14M
10. Description: Coated slow release NPK fertilizer (17:9:10+2MgO+TE)
11. Nutrient Content:
    11.1. Nitrogen (Total) (N): 17%
    11.2. Phosphorus Pentoxide (P2O5): 9%
    11.3. Potassium Oxide (K2O): 10%
    11.4. Magnesium Oxide (MgO): 2%
    11.5. Iron (Fe): 0.22%
    11.6. Manganese (Mn): 0.03%
    11.7. Boron (B): 0.01%
    11.8. Copper (Cu): 0.025%
    11.9. Molybdenum (Mo): 0.01%
    11.10. Zinc (Zn): 0.008%

420 Grass pre-seeding fertilizer

1. Supplier: Submit proposals
2. Manufacturer: DLF Trifolium, or equivalent & approved
    2.1. Product reference: Pro Fert 3
3. Description: Granular, controlled release NPK fertilizer
4. Nutrient Content:
    4.1. Nitrogen (N): 12%
    4.2. Phosphorus (P): 9%
    4.3. Potassium (K): 10%
    4.4. Plus trace elements

Manufactured soils & planting media

520 Imported manufactured planting media - structural tree soil Pits in hard

1. Description: Structural tree soil pits in hard landscape
2. Source: Bourne Amenity Ltd, or equal and approved
   2.1. Product reference: -Topsoil (600mm) Bourne Amenity tree sand
   -Subsoil (below 600) Washed subsoil sand
3. Location: Refer to AGV-GRA-BZ-XX-DR-L-004001
4. Application: In accordance with manufacturer's specification
5. Obtainable from:
6. Bourne Amenity Ltd, The Wharf, Rye Road, Kent
7. TN18 5QG
8. T: 01797 252299
9. W: https://bourneamenity.co.uk/
10. Additional requirements: Mycorrhizal fungul additive to be applied at each planting station and fully incorporated. Rate of application in accordance with supplier recommendations e.g. Rootgrow Mycorrhizal Fungi or equal approved

Execution

600 Existing site topsoil

1. Any existing site topsoil found to be unsuitable for reuse within the soft landscape areas is to be stripped in accordance with Section: **D20** of this specification and disposed of off site, unless noted otherwise.

620 Importing topsoil

1. Give notice: Before stripping topsoil for transfer to site.
   1.1. Notice period: 14 days

625 Sample loads

1. Description: For imported topsoil
2. Deliver to site a sample load: of not less than 5m³
3. Give notice: Allow inspection before making further deliveries to site. Retain for comparison with subsequent loads.
   3.1. Notice period: 14 days

630 Documentation for imported topsoil

1. Description: For all areas
2. Timing: Submit at handover.
3. Contents
   3.1. Full description of all soil components.
   3.2. Record of source for all soil components.
   3.3. Record drawings showing the location and depth of all soils by type and grade.
   3.4. Declaration of analysis: in accordance with BS 3882, clause 6 and Table 1.
4. Number of copies: Three

635 Documentation for compost and composted materials

1. Description: For imported soil improvers
2. Timing: Submit at handover.
3. Contents
   3.1. Full description of all compost components.
   3.2. Record of source for all compost components.
   3.3. Analyst's report for each test carried out.
   3.4. Declaration of compliance: in accordance with PAS 100 and BSI PD CR 13456.
   3.5. Quality Compost Protocol certification: Not required
4. Number of copies: Three

650 Notice

1. Give notice before
   1.1. Setting out.
   1.2. Spreading topsoil.
   1.3. Applying herbicide.
   1.4. Applying fertilizer.
   1.5. Visiting site during maintenance period.
2. Period of notice: 1 week

655 Mechanical tools

1. Restrictions: Do not use within 100 mm of tree and plant stems.

Subsoil preparation, grading and formation levels

660 Grading subsoil for

1. Description: -grassed areas;
   - ornamental planting beds; and
   - amenity planting areas
2. Standard: In accordance with BS 8601.
3. General: Grade to smooth flowing contours to achieve specified finished levels of topsoil.
4. Areas of thicker topsoil: Excavate locally.
5. Avoid compaction.
6. Excess subsoil: Remove.

661 Subsoil handling, placing & grading

1. Refer to relevant clauses within Section: **D20** of this specification

662 Subsoil - fine grading

1. Grade to smooth flowing contours to achieve specified finished levels of topsoil
2. Carry out minor grading and regulating to remove local depressions and high spots
3. Levels to be brought to to a uniform and even surface
4. The use of a heavy roller to roll out humps will not be permitted
5. Any area that becomes unduly compacted during the grading operations shall be loosened by forking or harrowing

663 Subsoil decompaction

1. Decompact all areas of subsoil prior to topsoiling to a depth of 300mm using a 3-tine ripper with tines set at 600mm spacing, and by crossing the ground twice at 90° in two directions (after checking for service locations to ensure no damage will be caused)
2. Where stiff clays or other cohesive material is found, loosen subsoil with a single tine ripper, 450mm deep at 1m centres and drawn by a crawler tractor
3. The Contractor shall make allowance for the use of a long armed excavator, or a toothed excavator bucket, to carry out the operation on steep banks or if restricted or in areas where ripping using a tine is inappropriate

664 Subsoil surface preparation

1. Cultivated areas are to be thoroughly cleaned, and all extraneous matter, including broken brick, broken glass, tarmace and large stones (over 200mm dia), or organic matter exposed by this operation, are to be removed and disposed off site

665 Subsoil surface preparation for

1. Description: -grassed areas;
   - ornamental planting beds; and
   - amenity planting areas
2. Standard: In accordance with BS 3882.
3. General: Excavate and/ or place fill to required profiles and levels, as section D20.
4. Loosening:
   - 4.1. When ground conditions are sufficiently dry to allow breaking up of soils, loosen thoroughly to specified depth:
     - 4.1.1. Light and noncohesive subsoils: 150 mm
     - 4.1.2. Stiff clay and cohesive subsoils: 300 mm
     - 4.1.3. Rock and chalk subgrades: Lightly scarify to promote free drainage.
   - 4.2. Wet conditions: Do not loosen subsoils.
5. Stones: Immediately before spreading topsoil, remove stones larger than: 75 mm
6. Remove from site: Arisings, contaminants and debris and Builders rubble

670 Inspecting formations

1. Give notice: Before spreading topsoil for: lawn areas and planting beds
2. Notice period: 10 days

Topsoil storage & placement operations

685 Surplus materials to be removed

1. Topsoil removal from site: Topsoil remaining after completion of all landscaping work
2. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

692 Topsoil storage heaps general

1. In order to prevent compaction of topsoil during stockpiling, the stockpiles shall be formed by tipping in mounds which shall not subsequently be tracked over by vehicles
   - 1.1. Vehicles used to transport the topsoil, or any other vehicle, must not be allowed to run over the heaps at any time
2. Topsoil stored in stockpiles shall be carefully transported, in order to prevent compaction, to required locations and evenly spread to specified depths

3. Areas used as stockpiles shall be reinstated to the original condition or as directed by: the CA
   3.1. Areas designated for topsoil (or subsoil) storage shall be stripped of topsoil first
4. Topsoil, shall be deposited loose in spoil heaps and shall not be compacted by any means
5. Topsoil spoil heaps shall be 'turned' after a period of: 3 (three)months and shall be re-seeded with green manures as required
6. The spoil heaps are not to exceed: 2 m in height unless otherwise authorised by the CA/Landscape Architect
7. Heaps shall be shaped to prevent surface water accumulation.
   7.1. Mound batters should have appropriate gradients to avoid risk of slumping and to facilitate the maintenance of the stored soils
8. Topsoil shall not be allowed to be contaminated with subsoil or any other unsuitable materials
   8.1. Topsoil stockpiles shall be kept free of pollutants and other materials at all times
   8.2. Topsoil shall not be stored with subsoil
9. Stockpiles shall be kept free of pernicious weeds
   9.1. All arisings consequent upon this operation shall be removed off site to tip

700 Grading of topsoil

1. Topsoil condition: Reasonably dry and workable.
2. Contours: Smooth and flowing, with falls for adequate drainage.
   2.1. Hollows and ridges: Not permitted.
3. Give notice: If required levels cannot be achieved by movement of existing soil.

702 Topsoil level adjustment

1. Blade grading: May be used to adjust topsoil levels provided depth of topsoil is nowhere less than:
2. Give notice to: CA/Landscape Architect: If required levels cannot be achieved by movement of existing soil

705 Handling topsoil

1. Standard: In accordance with BS 3882.
2. Aggressive weeds: Give notice and obtain instructions before moving topsoil.
3. Plant: Select and use plant to minimize disturbance, trafficking and compaction.
4. Contamination: Do not mix topsoil with:
   4.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   4.2. Other grades of topsoil.
5. Multiple handling: Keep to a minimum. Use or stockpile topsoil immediately after stripping.
6. Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall or when it is wetter than the plastic limit: less 3%, to BS 1377-2

707 Spreading topsoil general

1. Cut from the vertical faces of the stockpiles thus incorporating material from the surface and base together, rather than removing the soil in horizontal layers. This process will promote biological activity throughout the soil that is spread, ensuring that nutrient cycling and organic matter decomposition processes are maintained.
2. Spread over prepared formation in layers not exceeding 150mm and firm each layer before spreading the next.
3. Immediately before topsoiling, remove all debris such as stones and bricks over 50mm Ø, metal, timber or decayed and contaminated matter existing on the surface or uncovered during

decompaction operations. Inform the: CA if any evidence or symptoms of soil contamination are discovered on the site.

4. Finished topsoil depths:
   4.1. Tree pits: As defined in Clause: 507A of this specification
5. Refer to Soiling General Arrangement AGV-GRA-BZ-XX-DR-L-004001
6. Undertake topsoiling operations when the climatic conditions are suitable and in accordance with BS 4428. Topsoiling operations shall not be undertaken when the soil is waterlogged or frozen and once spread only machinery necessary to carry out subsequent operations shall be allowed access to the area. Such machinery shall be light in weight or of a suitable type to prevent compaction of the topsoil on underlying subsoil.
7. Use hand tools around trees, plants and in confined spaces, where it is impracticable to use machinery.
8. Where finished levels are not given, the levels shall be such that the finished surface will be smooth, even fall (or gently rolling curve) between the finished levels on the boundaries of the areas and to avoid ponding hollows.
9. Correct any shrinkages below the specified levels during: the Contract and/or Defects Liability Period

715 Loose tipping of topsoil

1. Standard: In accordance with BS 3882.
2. General: Do not firm, consolidate or compact topsoil when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

716 Final cultivation of grass seeding/turf areas

1. Timing: After grading and fertilizing
2. Seed bed: Reduce to a fine tilth with good crumb structure
   2.1. Depth: 25mm
3. Surface Preparation: Rake to a true, even surface, friable and lightly firmed, but not over compacted
4. Remove surface stones/earth clods exceeding:
   4.1. General Areas: 25mm
   4.2. Fine Lawn Areas: 10mm
5. Adjacent levels: Extend cultivation into existing adjacent grassed areas sufficient to ensure full marrying in of levels

717 Final cultivation

1. Description: Ornamental grass, shrub and herbacous beds
2. Compacted topsoil: Break up to full depth
3. Tilth: Loosen, aerate and break up topsoil to a tilth suitable for blade grading
4. Depth: 75 mm
5. Particle size (maximum): 10 mm
6. Timing: Within a few days before planting
7. Weather and ground conditions: Suitably dry
8. Surface: Leave regular and even
9. Levels: As section D20 and Clause 721 below
10. Undesirable material brought to the surface:
    10.1. Remove visible weeds
    10.2. Remove roots and large stones/clay balls with any dimension exceeding: 30 mm

11. Soil within root spread of trees & shrubs to be retained: Do not dig or cultivate

721 Finished levels of topsoil after settlement

1. Unless otherwise stated, finished levels of topsoil shall be:
2. Shrub beds: Shall generally be finished: 30 mm higher than grass areas, but shall be graded down at edges to finish
   50mm below grass or paved areas
3. Grass areas:
   3.1. Grass areas shall be: 30mm above paving/kerbs
   3.2. Seeded areas: Extend cultivation into existing adjacent grassed areas sufficient to ensure full marrying in of levels
   3.3. Falls across grass areas should follow a rolling curve rather than a straight bonded line
   3.4. Thickness of turf or mulch: Included
4. Adjoining building(s): Not less than: 150mm below finished floor levels and/or DPC
5. Sportsfields: To even levels and within the following permitted deviations:
   5.1. From levels or gradients shown on drawings: ±75mm
   5.2. From line between boning rods 30m apart: ±25mm
6. Adjacent to Existing trees:
   6.1. Not more than 75mm above previous soil levels at butt of existing trees
   6.2. Within root spread of existing trees and shrubs to be retained: Do not dig or cultivate
7. Adjoining soil areas: Marry in

725 Finished topsoil conditions

1. The finished surface shall consist of a uniformly consolidated crumb for the full working depth
   1.1. The degree of consolidation shall be consistent with the use to which the area is to be put
   1.2. As topsoiling proceeds, all consolidated wheel tracks shall be forked over
2. The surface shall be uniformly smooth, free from sharp bumps, small mounds or hollows and sufficiently smooth to allow the types of mechanical plant likely to be used in its maintenance to be operated with ease and without damage to the surface or machines due to unevenness of the ground.
   2.1. The surface of all topsoiled areas are to be cleared free of rubble, bricks, stone, timber etc.
3. Stone Picking:
   3.1. Shrub beds and native thicket areas: Stones over: 50mm in any one direction shall be removed
   3.2. Grass seeded areas: Stones over: 30mm in any one direction shall be removed
   3.3. Turf areas: Stones over: 20mm in any direction shall be removed
4. Topsoil works shall only be carried out when a reasonably dry crumbling tilth exists
   4.1. No further landscape operations are to be commenced until the ground preparation works have been done

Site-made topsoil & growing media - Not Used

On site amelioration of topsoil

801 General

1. Refer to Drg No.: Soiling General Arrangement for location/extent of different topsoil regimes
2. Following approval of topsoil placement, spread and incorporate soil ameliorants in accordance with: Q28 of this specification

3. Soil amelioration to be carried out in such a way as to provide an intimate and even mixture, with a finished surface of a uniformly light consolidated crumb.
    3.1. The degree of consolidation shall be consistent with the use to which the area is to be put
4. Prior to commencing soil amelioration works, the Contractor must submit a detailed method statement to: the CA/Landscape Architectdescribling the proposed method(s) of ameliorant application and incorporation
5. When storing soil ameliorants they shall be stored in clearly identifiable stores and in strict accordance with the suppliers' recommendations.
    5.1. The Contractor shall ensure that no mixing between the materials occurs and that bagged ameliorants are not subject to overheating or water damage
6. Sequence of Operations:
    6.1. Prior to commencing fine grading, the Landscape Contractor shall inspect/check the formation levels and be satisfied with the works before acceptance
    6.2. Apply topsoil to depths as specified
    6.3. Fine grade and cultivate in preparation for soil amelioration
7. Additional amelioration for tree, shrub and bulb planting is required to be incorporated at individual planting stations, in accordance with Clause: Q28/865-895

805A Applying soil ameliorant

1. Description: All areas
2. Refer to Section Q28 above for full list of soil amelioration requirements, products and rates of application.

840 Applying mycorrhizal inoculant

1. Description: To all bare root stock
2. Depth: To manufacturer's/ supplier's recommendations

845 Applying loose mulch

1. Timing: Immediately after planting
2. Preparation: Ensure that soil is thoroughly moistened, applying water where necessary
3. Coverage of mulch (minimum):
    3.1. Planting beds (depth): 75mm
    3.2. Trees: 100 mm depth in circular area around tree, 1m diameter from base of tree
    3.3. Container planting: 50mm depth
4. Finished level of mulch: 30 mm below adjacent grassed or paved areas

870 Topsoil amelioration

1. Description: Shrub beds
2. Evenly apply: 100 mm depth of Compost (as Clause Q28/361) over placed topsoil
3. Evenly apply Organic Fertilizer (: as Clause Q28/400) at a rate of 200g/m²
4. Evenly apply Soil Conditioner (: as Clause Q28/390) at a rate of 70g/m²
5. Fully incorporate above items into top: 250 mm of soil achieving an intimate mix 350mm deep
6. Following incorporation of organic fertilizer, thoroughly water if deemed necessary
7. The planting bed should be left fallow for a period of 5 days prior to planting - Refer to suppliers' recommendations

895 Topsoil amelioration

1. Description: Tree trenches

2. Backfill trenches with a pre-blended ameliorated topsoil, comprising 4 parts Topsoil (: as Clause Q28/326D):1part Compost (as Clause Q28/361)
3. Over fill trenches to allow for settlement as specified and to approved profiles
4. Contractor to allow for top dressing and any necessary adjustment to turf during the maintenance period to make good profiles if excessive settlement occurs

Completion

900A Record drawings

1. On completion of topsoil placement and finishing, the Contractor shall prepare digital, full and accurately dimensioned record drawings showing the works as finally installed and surveyed confirming the following:
    1.1. Finished levels as spot heights (on 20m grid)
    1.2. Contours at 0.5m intervals
    1.3. Location of all soils by type and grade
2. The drawings shall be submitted for CA/Landscape Architect approval
3. The works shall not be accepted as complete until agreed and suitable drawings have been submitted and approved

905 Applying maintenance fertilizer to soil

1. Description:
2. Duration: Carry out the following operations from completion of seeding/ turfing until practical completion.
3. Time of year: March- April
4. Application: Evenly spread, carefully incorporating below mulch materials.
5. Rate: In accordance with manufacturer's recommendations.

Ω End of Section

Q30
Seeding/turfing

To be read with preliminaries/general conditions. - Not Used

General information/requirements - Not Used

Preparation - Not Used

Seeding - Not Used

Turfing - Not Used

Protecting/cutting

590 Cleanliness

1. Soil and arisings: Remove from hard surfaces.
2. General: Leave the works in a clean, tidy condition at Completion and after any maintenance operations.

Maintenance

610 Failures of seeding/ turfing

1. Duration: Carry out the following operations from completion of seeding/ turfing until: the end of the rectification period.
2. Defective materials or workmanship: Areas that have failed to thrive.
   2.1. Exclusions: Theft or malicious damage.
3. Method of making good: Recultivation and reseeding/ returfing.
4. Timing of making good: Submit proposals

620 Maintaining

1. Description: All amenity lawn areas
2. Duration: Carry out the following operations from completion of seeding/ turfing until: the end of the rectification period.
3. Maximum height of growth at any time: 100 mm
4. Preparation: Before each cut remove all litter and debris.
5. Cutting: As and when necessary to a height of 35 mm.
   5.1. Arisings: Remove
6. Bulb planting areas: Do not cut until bulb foliage has died down.
7. Trimming: All edges.
   7.1. Arisings: Remove.
8. Weed control: Substantially free of broad leaved weeds.
   8.1. Method: Application of a suitable selective herbicide.
9. Stones brought to the surface: Remove regularly.
   9.1. Size: Exceeding 25 mm in any dimension.
10. Areas of settlement: Make good.
11. Watering: Contractor's choice

650 Maintaining grassed areas with perennial wildflowers

1. Duration: Carry out the following operations from completion of seeding/ turfing until: the end of the rectification period.
2. Preparation: Before each cut remove all litter and debris.
3. Height and frequency of cut in first growing season
   - 3.1. Time of first cut: Sept/October
   - 3.2. Height of first cut: 50 mm
   - 3.3. Frequency of subsequent cutting (minimum): Single annual Autumn cut (before end October)
   - 3.4. Height of growth permitted (maximum): n/a
4. Height and frequency of cut in second growing season
   - 4.1. Time of cut: Single cut in October
   - 4.2. Height of cut: 50 mm
5. Trimming: All edges.
   - 5.1. Arisings: Remove.
6. Watering: Contractor's choice to ensure full establishment

695 Handover

1. No payment for reseeding or turfing shall be made to the Contractor if the seed or turf fails due to any cause whatsoever. The Contractor shall make good the soiling and repeat the seeding or turfing until a good sward is obtained.
2. Grass areas will be only be accepted when germination has proved satisfactory and all weeds have been removed.
3. Damage, failure or dying back of grass due to neglect, including lack of watering shall be the responsibility of the Contractor.
4. Responsibility for the replacement of any areas of scorched, failed or damaged grass will be by and at the Contractor’s expense.
5. Any areas of damaged turf shall be re-laid, including all necessary recultivation and levelling, to match with the surroundings.
6. Turves to be cut to enable a neat rectangular patch. Repairs shall use whole turves unless otherwise instructed i.e. torn or cut turves will not be accepted.
7. Pre-Practical Completion maintenance shall conform to the standards set for Post-Practical Completion maintenance. In particular, attention shall be paid to grass cutting weeding and watering. Maintenance shall be carried out at a time of year under weather conditions appropriate to each operation.

Ω End of Section

Q31
External planting

Clauses - Not Used

To be read with preliminaries/general conditions.

5 Section index

General

10 Reference documents

1. Horticultural Trades Association,: *National Plant Specification*
2. Committee of Plant Supply & Establishment,: *Handling and Establishing Landscape Plants*, November 1995
3. BS3936-1:1992: *Nursery stock. Specification for trees and shrubs*
4. BS3936-2:1990: *Nursery stock. Specification for roses*
5. BS3936-3:1990: *Nursery stock. Specification for fruit plants*
6. BS3936-4:2007: *Nursery stock. Specification for forest trees, poplars and willows*
7. BS3936-7:1989: *Nursery stock. Specification for bedding plants*
8. BS3936-9:1998: *Nursery stock. Specification for bulbs, corms and tubers*
9. BS3936-10:1990: *Nursery stock. Specification for ground cover plants*
10. BS3936-11:1984: *Nursery stock. Specification for container-grown culinary herbs*
11. BS 8545:2014: *Trees: From nursery to independence in the landscape - Recommendations*
12. BS 4962:1989: *Specification for plastic pipes and fittings for use as subsoil field drains*
13. BS 8545:2014: *Trees: From nursery to independence in the landscape. Recommendations.*

15 Supporting documents

1. Plant Schedules: AGC377-GRA-X-2A-SP-9002
2. Supporting Images & Specification Notes: Refer to Appendices

20 Planting operations general

1. Standard of Workmanship: All materials and horticultural workmanship shall be the best of their kind, and comply with this specification.
2. Carry out the work while soil and weather conditions are suitable for the relevant operations. Planting programme to be approved by: CA/Landscape Architect
3. Use only machinery and tools suitable for the site conditions and the work to be carried out

3.1. Use hand tools around trees, plants and in confined spaces where it is impracticable to use machinery

4. Watering: Attention must be paid to watering all plant material and particularly to containerised plant material before, during and after planting to ensure successful establishment

5. Notwithstanding any prevailing restrictions by the Statutory Undertakers on the use of water for watering plants, the Contractor shall be deemed totally responsible for making any special arrangements which may be necessary to ensure successful establishment.

5.1. The Contractor will not be released from the obligation to replace all dead and dying plants at the end of the first season of growth or any plants which have suffered visually due to a lack of an availability of water.

25 Plant handling general

1. All plants shall be lifted, handled, packaged and stored in accordance with: the HTA *National Plant Specification* and CPSE's *Handling and Establishing Landscape Plants,* except in so far as the recommendations in these documents are modified in the following clauses:

1.1. No deliveries to site shall be carried out on Mondays

1.2. Loading shall be undertaken immediately prior to delivery, ie. plants must not to be stored/loaded on lorries for a duration exceeding 16 hours

1.3. All packaging, for either container-grown or open ground plants, shall be adequate to protect the plants and prevent them from heating, drying out or damage of any kind during transportation

1.4. All plants must be in a turgid state and stacked in such a way that breakage or crushing by the weight of the plants above, or securing ropes, will not occur during transit

1.5. The plants shall be loaded in a manner suitable to facilitate simple unloading techniques that are not labour intensive and minimise the risk of damage

1.6. All bare root trees, shrubs and transplants should be root dipped to manufacturer’s recommendations **- Q31/330**

30 Notice

1. Give notice to: CA/Landscape Architect in order to give the Landscape Architectthe opportunity to be present during:

1.1. Selection of all tree stock at supplier's/grower's nursery

1.2. Selection of all plant stock at supplier's/grower's nursery

1.3. Setting out of all plant stock

1.4. Application of herbicide

1.5. Application of ameliorants

1.6. Delivery of plants/ trees

1.7. Excavation & preparation of tree pits

1.8. Planting of shrubs

1.9. Planting of trees into previously dug pits

1.10. Watering

1.11. Each site visit during maintenance period

2. Period of notice: Two weeks

35 Watering

1. Attention must be paid to watering all plant material (particularly containerised plant material) before, during and after planting to ensure successful establishment.

2. Notwithstanding any prevailing restrictions by the Statutory Undertakers on the use of water for watering plants, the Contractor shall be deemed totally responsible for making any special arrangements which may be necessary to ensure successful establishment.

3. The Contractor will not be released from the obligation to replace all dead and dying plants at the end of the first season of growth or any plants which have suffered visually due to a lack of an availability of water.

General information/ requirements - Not Used

Preparation for planting operations

110 Site clearance - general

1. Refer to Section: **D20**of this specification for requirements

118 Soil conditions

1. Soil for cultivating and planting: Moist, friable and (except in aquatic/ marginal planting) not waterlogged.
2. Frozen or snow covered soil: Give notice before planting. Provide additional root protection. Prevent planting pit sides and bases and backfill materials from freezing.

120 Climatic conditions

1. General: Carry out the work while soil and weather conditions are suitable.
   1.1. Strong winds: Do not plant.

125 Times of year for planting

1. Deciduous trees and shrubs: Late October to late March.
2. Conifers and evergreens: September/ October or April/ May.
3. Herbaceous plants (including marginal): September/ October or March/ April.
4. Container grown plants: At any time if ground and weather conditions are favourable.
   4.1. Watering and weed control: Provide as necessary.
5. Dried bulbs, corms and tubers: September/ October.
6. Colchicum (crocus): July/ August.
7. Green bulbs: After flowering in spring.
8. Wildflower plugs: Late August to mid November or March/ April.
9. Aquatic plants: May/ June or September/ October.

130 Mechanical tools

1. Restrictions: Do not use within 100 mm of tree and plant stems.

145 Watering

1. Quantity: Wet full depth of topsoil.
2. Application: Even and without damaging or displacing plants or soil.
3. Frequency: As necessary to ensure establishment and continued thriving of planting.

150 Water restrictions

1. General: If water supply is or is likely to be restricted by emergency legislation, do not carry out planting until instructed. If planting has been carried out, obtain instructions on watering.

Plant procurement & delivery to site

201 Plant procurement - advanced procurement/contract growing

1. Refer to Clauses: **Q31/800 - 899**for requirements

202 Plant procurement - supporting documents

1. The Committee for Plant Supply and Establishment,: *Handling and Establishing Landscape Plants*, November 1995
2. Plant Schedules: AGV-GRA-BZ-XX-SH-L-009001
3. Planting Plans: Softworks General Arrangements
4. AGV-GRA-BZ-XX-DR-L-005001

205 Plant procurement - quality of stock

1. To be read in conjunction with Clauses: **Q31/210 - Q31/216, Q31/225 & Q31/235**
2. Nursery Visit: Contractor to include in their price for the: Landscape Architect to visit the nursery/nurseries where the planting is to be procured in order to identify and tag the proposed tree and shrub stock. Travel and accommodation, where required, is to be organised and paid for by the Contractor in liaison with the nursery, and reasonable out of pocket expenses are to be reimbursed.
3. Plant Materials: All plant material shall be first grade stock of the highest quality achievable. The: Landscape Contractor/Landscape Architect shall place great emphasis on the quality of roots and overall branch form/structure when inspecting plants for approval. Trees and shrubs with poor quality roots will be rejected regardless of the quality of the shoot system.
4. All plants shall conform to: BS3936 (Parts 1 to 11) and to the HTA *National Plant Specification*, unless otherwise scheduled/specified

206 Plant procurement - origin & provenance

1. Preference shall be given to UK grown/origin stock
    1.1. In particular, field grown native transplants, native wildflower and native aquatics shall be of UK origin, grown from UK provenance seed, cuttings, bud wood or grafts, etc.
    1.2. All UK native species must be UK grown origin with a fully traceable history and with a preference for local provenance, where feasible
2. Where plant stock is to be supplied from outside the UK
    2.1. Preference will be given to northern European nurseries
    2.2. All plants shall be properly hardened off before delivery
    2.3. Any stock sourced from outside of northern European nurseries must be acclimatized and fully hardy before delivery
3. All supplying nurseries (and their sub-suppliers) must:
    3.1. be fully compliant in respect of all restrictions regarding bringing certain plants and trees into the UK from the EU and beyond
    3.2. conform with all necessary notifications in respect of any import, particularly in respect of plant passports and all latest recommendations and associated guidance from the Animal and Plant Health Agency (APHA) and the Department for Environment Food & Rural Affairs (DEFRA)
4. Additional advice and notifications may also include consultation with:
    4.1. Forestry Commission (FC)
    4.2. Royal Horticultural Society (RHS)
    4.3. Horticultural Trades Association (HTA)
    4.4. International Association of Horticultural Producers (AIPH)
    4.5. Arboricultural Association (ARB)
    4.6. Landscape Institute (LI)
5. All species listed as notifiable, and requiring plant passports, must be UK grown/origin stock, with a traceable history and valid plant passport confirming that they have been sourced from a disease-free area/site.

5.1. Particular requirements relating to specific notifiable diseases and pests are set out in Clauses **A02/70 - 80** .

210 Plant procurement - trees

1. Form:
2. Transplants: Shall have been transplanted or undercut at least once in their life. The age and height shall be stated and in accordance with the plant schedules. Root collar shall be as scheduled. All transplants shall have a well-developed fibrous root system, strong central leader (where appropriate) and well-structured laterals.
3. Feathered Trees: Shall have a upright central leader and a stem furnished with evenly spread and balanced lateral growth down to, or within, 300mm of ground level.
4. Standard Trees: Shall have a substantially upright central stem, clean of lateral growth, supporting an even balanced/proportioned and well-branched crown.
   4.1. The crown shall have a central leader and branching appropriate for the species. No main branches shall cross.
   4.2. The clear stem shall be clean, free of recent legging up marks.
5. Semi Mature Trees: Shall be transplanted as specified in the Plant Schedules and great emphasis shall be placed upon this, ie a 5x tree will have a field spacing and root structure which confirms its history.
   5.1. They shall have a substantially upright central stem, clean of lateral growth, supporting an even balanced/proportioned and well-branched crown.
   5.2. The crown shall have a central leader and branching appropriate for the species. No main branches shall cross.
   5.3. They shall be selected to meet the very best quality and form available.
6. Multi Stem Trees: Shall have a minimum number of main stems and main stem to break from below ground level, as specified.
   6.1. They shall be true multi stem trees, i.e. originating from one root system.
   6.2. The minimum stem girth shall be in accordance with the Plant Schedules.
   6.3. The tree structure shall be balanced and well-branched with a minimum crown diameter in accordance with the plant schedules.
7. Bushy Trees: Shall have many main stems arising from or very near to ground level, growing from one root system.
   7.1. They shall be of a height and diameter in accordance with the Plant Schedules.
   7.2. The structure/crown shall be well balanced and dense with the majority of stems of equal diameter.
8. Age/Condition or No. of Times Transplanted: :
9. Age/condition shall be in accordance with the Plant Schedules. All trees shall be transplanted a sufficient number of times to encourage a compact and fibrous root system. Rootball holes at the supply nursery are to confirm this.
10. Root Collar Girth or Diameter:
11. Girth Trees: Shall be measured 1 metre above the ground level, and shall be in accordance with the Plant Schedules. All trees shall be tagged by colour marking ribbon using the standard industry code.
12. Root Collar Diameter (Transplants): Must be typical of species and representative of the specified height. Generally this should be 8/10mm or 10/12mm range.
13. Root Condition: :
14. The root system must be well developed by good nursery practice. The system must not show any coiled main roots close to the collar, nor any physical damage.
15. Bare root Trees / Shrubs:

16. Shall be supplied in bags, containing and enclosing the whole root system. All shall be root dipped in accordance with: **Q31/330**. Rootballs shall be firm and solid and they must be well 'rooted through'. Rootballs must be enclosed in Hessian (Burlap). The size of the rootball must be appropriate for the species and cultivar, and its age and growth rates under the cultural and soil conditions in which it is growing.
17. For standard trees of girth 12-14cm and larger, and the equivalent size of multi stemmed trees, the rootballs must be additionally protected with ungalvanised wire netting.
18. Container Grown Trees:
19. Shall be grown in the container for sufficient time for the root growth to have substantially penetrated the medium but not be root bound. Rooting must be well balanced in accordance with the container size. Plants are to be centred in the container, well rooted, firm and moist on delivery, with the growing medium coming within a suitable depth of the pot rim. The surface of the growing medium shall be maintained moss, liverwort and weed free at all times. Plants shall be supplied in rigid containers. The compost shall not contain peat from UK sites of Special Scientific Interest or equivalent designated from other countries.
20. Top / Bottom Working: :
21. All trees shall be bottom worked unless otherwise specified

211 Plant procurement - shrubs

1. Age/Condition: The overall height and/or spread shall be in accordance with the Plant Schedules
2. Root Condition: The root system must be well developed by good nursery practice. The system must not show any coiled main roots close to the collar, nor any physical damage.
3. Container Grown Shrubs: Shall be grown in the container for sufficient time for the root growth to have substantially penetrated the medium but not be root bound. Rooting must be well balanced in accordance with the container size.
4. The requirements set out in the schedules are a guide to the required heights and number of breaks (in the lower 1/2 of the plants). Whilst it is recognized that these may vary they will be regarded as a target for measurement for a production regime of 'pinching' or trimming to produce a bushy subject.
5. Plants are to be centred in the container, well rooted, firm and moist on delivery, with the growing medium coming within a suitable depth of the pot rim. The surface of the growing medium shall be maintained moss, liverwort and weed free at all times. Plants shall be supplied in rigid containers. The compost shall not contain peat from UK sites of Special Scientific Interest or equivalent designated from other countries. The compost must be of open texture yet retain adequate moisture to encourage a good rooting system. The compost will hold sufficient reserves of nutrients, to be a slow release from 14-16 months, to maintain the plant in a satisfactory condition for a reason period from the time after leaving the supplier's nursery.
6. After potting or when growth dictates, or as instructed ,all plant stock shall be spaced at a minimum of half pot width apart, depending upon species type , to facilitate a full and uniform leaf coverage to develop, to the crown evenly radiating around the pot . Stock which is allowed to grow into each other and is materially substandard shall be rejected. The Supplier shall make full allowances for maintaining the regime throughout the contract grow/reservation period.
7. Habit:
    7.1. A plant scheduled as 'bushy' shall have numerous lateral shoots arising from either a central point or elsewhere (subject to variety). The plants shall be dense with an evenly balanced head with growth generally covering the pot.
    7.2. A plant scheduled as 'leader & laterals' shall have a single dominant shoot with significant side shoots. In particular, shrubs scheduled as hedging planting and are to be fit for this purpose, ie. a dense even head through the plants height.

212 Plant procurement - climbers

1. Root Conditions: The root system must be well developed by good nursery practice. The system must not show any coiled main roots close to the collar, nor any physical damage.

2. Container Grown Climbers: Shall be grown in the container for sufficient time for the root growth to have substantially penetrated the medium but not be root bound. Rooting must be well balanced in accordance with the container size.
3. Plants are to be centred in the container, well rooted, firm and moist on delivery, with the growing medium coming within a suitable depth of the pot rim. The surface of the growing medium shall be maintained moss, liverwort and weed free at all times. Plants shall be supplied in rigid containers. The compost shall not contain peat: from UK sites of Special Scientific Interest, or equivalent designations from other countries.
4. Habit: Climbers shall have several shoots (unless otherwise stated) arising from ground level
   4.1. The number of breaks shall be in accordance with the Plant Schedules.
   4.2. Shoot structure shall be strong and of even spread / growth and girth.
   4.3. Climbers shall be supplied on an approved fan framework which fully supports the plant for its full height and be designed to have a service life of minimum 2No. seasons following delivery.

213 Plant procurement - herbaceous perennials & bulbs

1. **Plants**
2. Root System: The root system must be well developed and correspond to the species/cultivar, and its age and growth rates under the cultural and soil conditions within which it is growing. The system must show a good balance between the growing parts, ie. the buds and the roots and no physiological damage. This is especially important for plants grown from divisions.
3. Plants which have been stored in cool conditions must have good viability, must not have been allowed to dry out, and must be free from fungal infections. Perennials from cold store which are potted and grown on must have established a strong and vigorous root system before delivery. Perennials which are delivered out of cold storage after 1 May must be designated as cooled plants. The root system must not be allowed to dry out at any time.
4. Root Condition and Form: Plants in containers shall have a good root system applicable to the species/cultivars. Plants in growth must stand well and upright in the container, the pot or container must be filled for a least 90% with plant roots and soil and the compost must be moist. The surface growing medium shall be free of moss, liverwort and weeds. The compost shall not contain peat: from UK sites of Special Scientific Interest or equivalent designated from other countries.
5. The Nursery will be expected to ensure that appropriate species are suitably grown to encourage full flowering in the year of planting. All plants shall show a high degree of extension growth typical of the species and appropriate to the specified container size. The plants shall be spaced on the nursery to allow full and uniform branch/ leaf structure coverage to develop, evenly radiating around the pot.
6. **Bulbs**
7. All bulbs and corms shall be in accordance with BS 3936-9:1998: *Nursery Stock - Specification for bulbs, corms & tubers*, and be clean and healthy, sound and ripe, free from pests and diseases, virus free and conform to the size and type scheduled.
8. When scheduled as: *Topsize*, the largest grade bulb commercially available is required.

215 Plants/ trees - specification criteria

1. Name, forms, dimensions, provenance and other criteria: As scheduled and defined in the: *National Plant Specification* (available on CS Design Software Limited's website).

220 Preferred suppliers/nurseries - trees

1. The preferred suppliers/nurseries for tree stock are:
2. **Wyevale Nurseries**:
   Wyevale nurseries Ltd
   Kings Acre
   Hereford, HR4 7AY

Tel: 01432 845200
Contact: Andy Congera - andyc@wyevale-nurseries.co.uk

Von Ehren Nurseries:
Pflanzenhandel Lorenz von Ehren GmbH & Co.
KGMaldfeldstr. 4 | D-21077
Hamburg
Tel: +49 40 76108 271 / +44 (0)1865 910261
Contact:- Peter Flugge - peter@LvE.de- Sebastian Beindorff - sebastian@LvE.de

Van den Berk Nurseries:
Nursery Gebr. van den Berk
B.V.Donderdonk 45492
VJ Sint-Oedenrode
Netherlands
Tel: +31 (0)413 480482
Contact: Jan van Vechel - jan@vdberk.nl

221 Preferred suppliers/nurseries - shrubs & herbaceous perennials

1. The preferred suppliers/nurseries for shrub and herbaceous plant stock are:
2. **Wyevale Nurseries**:
   Wyevale nurseries Ltd
   Kings Acre
   Hereford, HR4 7AY
   T: 01432 845200Contact: Andy Congera - andyc@wyevale-nurseries.co.uk

   Johnsons of Whixley:
   Johnsons of Whixley
   Whixley
   York
   TO26 8AQ
   T: 01423 330234

   Robin Tacchi Plants:
   Fen Farm
   Garboldisham
   Norfolk,
   IP22 2RL
   T: 01953 681312
   E: rtp@robintacchiplants.com
   W: www.robintacchiplants.com

225 Bulbs/ corms/ tubers

1. Condition: Firm, entire, not dried out or shrivelled.
2. Health: Free from pests, diseases and fungus.
3. Handling: Remove from packaging immediately.
4. Storage: Permitted only when necessary.
   4.1. Location: Well ventilated, dark, covered, rodent proof container, away from exhausts and fruit.
   4.2. Duration: Minimum period.
   4.3. Temperature: 18-21°C.

235 Container grown plants/ trees

1. Growing medium: With adequate nutrients for plants to thrive until permanently planted.

2. Plants: Centred in containers, firmed and well watered.
3. Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
4. Hardiness: Grown in the open for at least two months before being supplied.
5. Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

245 Labelling and information

1. General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling for delivery to site, showing:
   1.1. Full botanical name.
   1.2. Total number.
   1.3. Number of bundles.
   1.4. Part bundles.
   1.5. Supplier's name.
   1.6. Employer's name and project reference.
   1.7. Plant specification, in accordance with scheduled National Plant Specification categories.
2. Additional information: Submit on request: - Country of Origin
   - Date supplied and consignment details or reference
   - Impact of Pest/Disease
   - Potting dates, and
   - Type of Container

260 Plant/ tree substitution

1. Plants/ trees unobtainable or known to be likely to be unobtainable at time of ordering: Submit alternatives, stating:
   1.1. Price.
   1.2. Difference from specified plants/ trees.
2. Approval: Obtain before making any substitution.

265A Plant handling, storage transport and planting

1. Standard: To CPSE ': *Handling and establishing landscape plants*'.
2. Frost: Protect plants from frost.
3. Handling: Handle plants with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.
4. Plant packaging: Coextruded polyethylene bags with black interior and white exterior
5. Packaging of bulk quantities: Adequate to protect the plants and prevent drying out or heating or damage of any kind during transportation
6. Planting: Upright or well balanced with best side to front.
7. All plants must be in a turgid state and stacked in such a way that breakage or crushing by the weight of the plants above or securing ropes will not occur in transit.
8. The plants shall be loaded in a manner suitable to facilitate simple unloading techniques which are not labour intensive and minimise risk of damage.
9. No plant deliveries on Mondays. Loading shall be undertaken immediately prior to delivery, i.e. plants are not to be stored/loaded on lorries for durations exceeding 16 hours.
10. All bare root trees, shrubs and transplants are to be root dipped in a 1: 3 Alginure root dip solution to manufactuer's recommendations.

279 Plant spacing general

1. Setting Out: Clearly mark boundaries of planting areas and location of trees and obtain approval before starting work
2. Tree positions shall be set out on site well before planting or pit excavation and marked with canes or stakes
3. The: Landscape Architectis to be given notice/opportunity to approve setting out prior to planting holes being excavated
4. Plant Spacing: To be carried out in accordance with the drawings and schedules
5. The: Landscape Architectreserves the right to adjust the exact position of specimen shrubs after they have been pegged out and the Contractor is deemed to have included for such adjustments within the tender
6. The intention is to space the plants evenly so when established they will completely fill the area indicated

280 Treatment of tree wounds

1. Cutting: Keep wounds as small as possible.
    1.1. Cut cleanly back to sound wood using sharp, clean tools.
    1.2. Leave branch collars. Do not cut flush with stem or trunk.
    1.3. Set cuts so that water will not collect on cut area.
2. Fungicide/ Sealant: Do not apply unless instructed.

285 Protection of existing grass

1. General: Protect areas affected by planting operations using boards/ tarpaulins.
    1.1. Excavated or imported material: Do not place directly on grass.
    1.2. Duration: Minimum period.

290 Surplus material

1. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

Plant containers - Not Used

Planters/plant containers - Not Used

Preparation of planting beds/ planting materials

302 Chemicals generally

1. Weed clearance shall only be by hand or mechanical means only
    1.1. Chemicals may only be used with the written approval of the: CA
2. Use only where specified or approved, and then only products on the current list of the Agricultural Chemicals Approval Scheme.
3. Where work is near water, drainage ditches or land drains, comply with the Department for Environment, Food & Rural Affairs (DEFRA) Code of Practice for the use of herbicides on weeds in water courses and lakes.
4. Observe all precautions recommended by the manufacturer and remove containers from site immediately they have been emptied or are no longer required.

304 Herbicide application general

1. Herbicide application shall only be carried out by persons legally qualified to do so. The Contractor shall submit evidence of such qualifications to: CA prior to the application of herbicide
2. The Contractor shall not carry out spraying during unsuitable conditions, e.g. during rainfall or when extensive rainfall is forecast or during windy weather etc. which may cause spray to drift onto adjoining land. The Contractor will be held responsible for any damage or injury to persons or property resulting from this operation and must indemnify the Client against all claims from damage.
3. Spraying or spreading equipment shall be of an approved design and suitable for the type or terrain. Knapsack sprayers and other forms of portable equipment shall be used on banks and areas with difficult access. All spray equipment shall be fitted with a guard to prevent spray reaching the trees and shrubs to be retained. Any trees or shrubs (defined as to be retained) damaged by chemicals shall be replaced by and at the Contractor's expense.
4. All relevant Acts of Parliament, in particular 1998 COSHH Regulations, and the manufacturer's instructions concerning the handling, use and storage of chemicals shall be followed. Containers and other contaminated equipment shall be cleared from site after each days work.

310 Fertilizers, soil ameliorants, conditioners, composts, etc.

1. Refer to Section: **Q28** of this specification for details/requirements

320 Topsoil cultivation

1. Refer to Clause: **Q28/717** for requirements

330 Mycorrhizal inoculant

1. Description: All bare root stock
2. Manufacturer: Tilco-Alginure GmbH, or equivalent & approved
3. Hollanderkoppel 1a
4. 23858 reinfeld
5. Germany
6. **T**: 00 49 4533 2080023
7. **E**: monnet@tilco-biochemie.de
8. **W**: www.alginure.de
   8.1. Product reference: Alginure Root Dip
9. Application: Apply to roots of bare root plants before planting and backfilling

Planting shrubs/ herbaceous plants/ bulbs

407 Planting shrubs and transplants

1. Plant at the same depth as previously grown, care being taken to avoid damage to the root system and stems
2. Position showing their best side to the front
3. Bare roots shall be carefully spread out and packed around with soil. The plants shall be gently shaken to allow the fine soil to surround the roots. As the rest of the soil is returned, it shall be well consolidated and firmed round the roots to eliminate all air pockets.
4. Sufficient soil shall be taken out from the bed to enable the roots to be fully spread.
5. All plants shall be pit planted in accordance with: **Q31/408**
6. Notch planting of transplants will not be approved

408 Soft landscape planting pit requirements

1. The diameter of each pit shall be a minimum 300 mm greater than the average spread of the root system at the time of planting, i.e. minimum 150mm between edge of rootball and planting pit.
2. Where the depth of the pit(s) exceed(s) the ameliorated topsoil depth (e.g. shrubs within grass areas), subsoil shall be removed and replaced with the soil prescription as scheduled below, i.e. non-ameliorated subsoil/topsoil shall not form part of the backfill
3. Refer to Clauses: **Q28/345 - 395** for details of topsoil ameliorants
4. This schedule gives the minimum pit sizes for guidance only: , for Tender purposes, and should be read in conjunction with the planting plans, topsoiling plans and soft landscape details. The actual size required will depend on a number of factors, e.g. containerized v. rootball stock, and should be derived from the above provision:
5. Ground cover:
6. Pit Size/Depth: 300 x 300 x 250mm Dp
7. Backfill: Ameliorated soil (as dug)
8. Containerised Shrubs:
9. Pit Size/Depth: 300 x 300 x 300mm Dp
10. Backfill: 30g Soil Conditioner (**Q28/390**), blended with 3(three) parts ameliorated topsoil (as dug) and 1 (one) part Organic Compost (**Q28/361**)
11. 1+2 transplants:
12. Pit Size/Depth: 300 x 300 x 250mm Dp
13. Backfill: 30g Slow Release Fertilizer (**Q28/410**)per pit, in accordance with manufacturer's recommendations, backfilled with as dug ameliorated topsoil (as dug)
14. Specimen shrubs (5L+):
15. Pit Size/Depth: 450 x 450 x 300mm Dp
16. Backfill: 75g Soil Conditioner (**Q28/390**), blended & back-filled with 3 (three) parts ameliorated topsoil (as dug) and 1 (one) part Organic Compost (**Q28/361**)
17. **Bulbs**:
18. Refer to Clause: **Q31/450**

409 Post planting operations

1. Immediately after planting shrubs, carefully cut back any damaged, dead or diseased branches and remove any weak, thin or malformed growth. Where and to the extent appropriate for the species, cut back to encourage growth.
2. Water plants thoroughly, immediately after planting, using a fine rose.
3. Allow for cutting back shrubs and transplants as directed by the Landscape Architect

420A Climbing plants

1. Planting: 150 mm clear of supporting structure (e.g. wall/ fence) with roots spread outward.
   1.1. Branches: Lightly secured to supports.
2. Climber supports: Horticultural plastic covered wire ties as necessary to support individual climbers to fence. Canes/trellis supplied with plants to be retained in-situ post planting to establishment.

435 Climbing plants used as ground cover

1. Planting
   1.1. Canes or other supports: Remove.
   1.2. Arrangement: Spread stems.
2. Fixing: Pinned to ground to ensure good contact.

445 Planting bulbs/ Corms/ Tubers

1. Depth: Top of bulb/ corm/ tuber at a depth of approximately twice its height, base in contact with bottom of hole.
2. Backfilling: Finely broken soil. Lightly firm to existing ground level.
3. Naturalized planting in existing grassed areas
    3.1. Scattering: Random. Plant bulbs/ corms/ tubers where they fall.
    3.2. Planting: Neatly remove a plug of turf and replace after planting.

450 Bulbs general operations

1. Throw on the ground in loose drifts to ensure natural spacing then carefully planted with a trowel, bulb planter or other approved planting methods to the following depth:
    1.1. Medium bulbs (eg Alliums): 100mm
    1.2. Small bulbs (eg Bluebells): 50mm
2. All bulbs and corms shall be planted in the appropriate season with a suitable planting tool of appropriate pattern and at the correct depth.
3. The hole formed shall be of sufficient diameter to accommodate the bulb or corm which shall have its base in contact with the soil at the bottom.
4. In fine turf, a plug or turf shall be neatly removed and replaced after planting.
5. Within lawns, extent of bulb planting to be pegged out and agreed with: Landscape Architect
6. **All Allium bulbs shall be backfilled with sufficient quantities of approved propriety fibrous bulb planting compost to base of hole to ensure good free draining amelioration.**

470 Formal hedges

1. Shrubs for hedges: Consistent in species, cultivar and clone to ensure a uniform hedge.
2. Planting: In trenches large enough to take full spread of roots. Set out plants evenly.

480 After planting

1. Watering: Immediately after planting, thoroughly and without damaging or displacing plants or soil.
2. Firming: Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
3. Top dressing: Mulching and top dressing system, as section Q28
    3.1. Depth: 25-30 mm

482 Watering:

1. During establishment of planting ensure that sufficient water is applied to maintain healthy growth. Attention must be paid to watering all plant material and particularly to containerised plant material before, during and after planting to ensure successful establishment
2. Notwithstanding any prevailing restrictions by the Statutory Undertakers on the use of water for watering plants, the Contractor shall be deemed totally responsible for making any special arrangements which may be necessary to ensure successful establishment. The Contractor will not be released from the obligation to replace all dead and dying plants at the end of the first season of growth or any plants which have suffered visually due to a lack of an availability of water

487 Mulch - ornamental bark mulch

1. Description: All plant beds and tree planting stations
2. Description: Ornamental bark mulch
3. Supplier: Melcourt Industries Ltd or equal approved
   Boldridge Brake,
   Long Newnton,

Tetbury,
Glocs GL8 8RT
Tel. 0166 502711
Email: mail@melcourt.co.uk
Web: www.melcourt.co.uk

3.1. Product Reference: Ornamental Bark Mulch or equal approved

4. Location: All plant beds unless noted otherwise. See also Clause 488.
5. Depth: 75mm
6. Application: Immediately on completion of planting, mulch the whole surface of completed planting bed
7. Size: Graded bark mulch to have an even particle size distribution between: 5-35mm
8. All dust and fine material to be excluded
9. The mulch shall be pest, disease, fungus, weed and contamination free
10. The mulch shall entirely comprise chipped bark and shall be free from 'white' wood, twigs, leaves, etc.
11. Submit samples and product data sheets to: Landscape Architect for approval prior to use/order
12. Remove any spillage of soil, ameliorants and mulches from all hard surfaces and grassed areas and leave the works in a clean tidy and pristine condition at Practical Completion
13. Additional requirements: - Fire tested in accordance with BS4790:1987- Forest Stewardship Council (FSC) Certified source

488 Mulch - washed gravel

1. Description: Trees within hard landscape unless noted otherwise
2. Description: Clean washed angular gravel
3. Supplier: CED Ltd or equal approved
   728 Thurrock Road
   Grays,
   Essex RM20 3LU
   Tel. 01708 867237
   Email: enquiries@cedstone.co.uk

   3.1. Product Reference: Scotia Grey Aggegrate (Granite)
4. Location: Trees within hard landscape unless noted otherwise
5. Depth: 75mm depth typically
6. Application: Immediately on completion of planting, mulch the whole surface of completed planting bed
7. Size: 10mm nominal dimension in any direction
8. Submit samples and product data sheets to: Landscape Architectfor approval prior to use/order
9. Remove any spillage of soil, ameliorants and/or mulches from all hard surfaces and leave the works in a clean, tidy and pristine condition at Practical Completion
10. Additional requirements: None

491 Mulching - trees in soft landscape areas

1. Material: As Clause 487

   1.1. Purity: Free of pests, disease, fungus and weeds.
2. Preparation: Clear all weeds. Water soil thoroughly.
3. Coverage: In a circular area of 800 mm radius measured from the tree stem
4. Depth: 75mm
5. Finished level of mulch: 30 mm below adjacent grassed or paved areas

Planting trees

501 Planting rootball plants

1. Plant to the depth of the nursery soil mark on the stem. The soil shall be distributed evenly around the root system.
2. All work shall comply with BS 8545:2014: *Trees: From nursery to independence in the landscape. Recommendations*.
3. During periods of intense and prolonged frost, measures shall be taken to protect the bottom and sides of the excavated trench and the root balls of trees awaiting planting
4. Dig pits, taking care not to glaze or compact the surface. If any glazing or compaction occurs it shall be thoroughly roughened and worked to ensure unrestricted movement of water.
5. Orientate plants to present the best face to an edge of road or building as agreed with the: Landscape Architect
6. Prior to planting the rootball shall be measured and any necessary adjustments to the pit/trench made
7. The tree shall be set in the pit/trench so that the top of the rootball is: 50mm proud of surrounding ground levels to allow for settlement
8. Plant to give a vertical trunk and leader
9. The outer surface of the rootball shall be examined for damage, where required by the: Landscape Architect, by rolling back or cutting the burlap. Any hard surfacing or glazing shall be carefully slit or scarified.
10. Fertiliser shall be incorporated into the backfill in accordance with the schedule(s) in: **Q31/408 & 508**
11. Root balls of all trees under this Contract shall be seated on a watering pipe, as specified, installed around the rootball and coming to surface as detailed. The end of the pipe shall be flush with adjacent ground levels and pipe ends shall be fitted with a hinged inspection cap to: Landscape Architect approval.
    11.1. Refer to Clause: **Q31/514**
12. The Contractor shall ensure that openings to watering pipes are kept free from ingress of all materials
13. The trees shall be securely anchored so that the rootball does not pivot in the soil under windy conditions
14. On completion of planting any broken branches shall be pruned, damaged areas of bark shall be neatly pared back to sound tissue

505 Tree pits

1. Sizes: As Clause 508
2. Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout.
3. Excavated material: Refer to D20, Q28 and Clause 508.
4. Pit bottoms: Excavate with slightly raised centre: Break up base to a depth of 150 mm.
    4.1. Treatment: As Clause 508
5. Pit sides: Scarify.
6. Backfilling material: As Clause 508

508 Soft landscape tree planting pit requirements

1. These tree pit dimensions are given as guidance only: , for Tender purposes, and should be read in conjunction with the planting plans, topsoiling plans and soft landscape details
2. The diameter of each pit shall be a minimum: 150mm greater than the average spread of the root system at the time of planting

3. Where the depth of the pit(s) exceed(s) the ameliorated topsoil depth (e.g. specimen trees), subsoil shall be removed and replaced with the soil prescription as scheduled below, i.e. non-ameliorated subsoil/topsoil shall not form part of the backfill
4. Refer to Clauses: **Q28/345 - 395**for details of topsoil ameliorants
5. All tree pits to have a gravel drainage layer to base in accordance with: **Q31/521**
6. This schedule gives minimum pit sizes. The actual size required will depend on a number of factors, e.g. root condition (containerized/air-pot/rootball), and should be derived from the above provision: and the tree pit details:
7. Trees : **(including small multi-stem)**:
8. Pit Size/Depth: 1200 x 1200 x 900mm Dp
9. Backfill: Pre blended backfill comprising of: 300g Soil Conditioner (**Q28/390**),
   5L Compost Additive (**Q28/393**),
   120LOrganic Compost (**Q28/361**)plus
   ameliorated topsoil
10. Trees 18cm-30cm girth: :
11. Pit Size/Depth: 1750 x 1750 x 1200mm Dp
12. Backfill: Pre blended backfill comprising of: 300g Soil Conditioner (**Q28/390**),
    15L Compost Additive (**Q28/393**),
    120L Organic Compost (**Q28/361**)plus
    ameliorated topsoil
13. Trees 30cm - 60cm girth:
14. Pit Size/Depth: 2000 x 2000 x 1500mm Dp
15. Backfill: Pre blended backfill comprising of: 400g Soil Conditioner (**Q28/390**),
    30L Compost Additive (**Q28/393**),
    160L Organic Compost (**Q28/361**) plus
    ameliorated topsoil
16. Trees 60cm+ girth:
17. Pit Size/Depth: 2500 x 2500 x 1650mm Dp
18. Backfill: Pre blended backfill comprising of: 400g Soil Conditioner (**Q28/390**),
    30L Compost Additive (**Q28/393**),
    240L Organic Compost (**Q28/361**) plus
    ameliorated topsoil

510 Tree pit root barriers

1. Locations: Tree pits, refer to typical tree pit details and Softworks/Soiling General Arrangement Plans for locations. Protection of all drainage and utilities to Engineer's details and specification.
2. Manufacturer: Dendro-Scott (Peter Scott Tree Care) Ltd or equal approved
   30 Ravensbury Ave
   Morden
   Surrey SM4 6ET
   Tel. 020 8254 5889
   Email: sales@rootbarrier.com
   Web: www.rootbarrier.com

   2.1. Product reference: Dendro-Scott Root Barrier or equal approved
3. Thickness: 0.3mm
4. Barrier depth: Typically 1.0m, unless detailed otherwise. Supplied as a roll with compatible tape for jointing.
   Note specific requirements for TP01 pit type - refer to Tree Pit Details
5. Foil liner: n/a
6. Top of root barrier in relation to finished topsoil level: Flush
7. Installation: With sides vertical. Remove all sharp objects adjacent to barrier.

514 Aeration pipes

1. All trees and specimen shrubs within this contract are to be planted incorporating tree pit irrigation systems
2. Supplier: Greenleaf, or equal & approved
   2.1. Product Reference: Root Rain Metro
3. Cap Types:
   3.1. Trees in soft landscape areas: Plastic cap, i.e. RR1 - RR4
   3.2. Trees in hard landscape areas: Metal cap with chain, i.e. RRMC4
4. Note: All to be fitted in accordance with suppliers recommendations and sized as scheduled by suppliers information pack.

521 Tree drainage general

1. The Contractor is responsible for the supply and installation of tree pit drainage & tree drains as shown on the contract drawings: Engineer's drainage drawings and specification
2. Generally:
   2.1. Install to all connections and falls to ensure the drains are fit for purpose
   2.2. Provision for all connections of tree drains to service chambers (installed by others) shall be included in the Contractor's rates
3. Before starting work, check the invert levels and positioning of the existing drains, sewers, catch pits, inspection chambers and service holes against the information shown on the drawings and report any discrepancies to the: CA
4. Adequately protect existing drains to be retained and maintain their normal operation during work
5. Pipes shall be non-PVC flexible plastic perforated land drains to BS 4962:1989 *Specification for plastic pipes and fittings for use as subsoil field drains*

522 Tree pit drainage

1. Locations: All tree pits
2. Depth of excavation: Increase from specified size to allow for aggregate layer, with base slightly falling to outlet.
3. Aggregate layer: Clean gravel or broken stone, with no fines, graded 40 to 20 mm.
   3.1. Depth: Minimum 300mm, base of pit laid to fall
4. Drainage pipes:
   4.1. Type: As Clause 521
   4.2. Diameter: Refer to Engineer's Details and Specification
   4.3. Position: Lay around perimeter of pit within aggregate layer.
   4.4. Discharge: Subject to infiltration rates of made ground; connect to land drains. Refer to Engineer's drainage drawings and specification
5. Geotextile filter:
   5.1. Manufacturer: Terram Ltd or equal approved
      5.1.1. Product reference: T1000 or equal approved
   5.2. Position: Lay over aggregate before installing tree or backfill. To be installed in accordance with the Manufacturer's recommendations.
6. Completed pits: Test for free drainage before planting.

523 Installation of tree drains

1. Lay pipes in good weather conditions using methods suitable for the site conditions to prevent compaction, smearing, top ponding and damage to the soil structure

1.1. Pipes shall be laid to line and gradient on a firm bed free from loose soil backfill or slurry

1.2. Pipe junctions between branches and mains shall be formed with purpose made components

1.3. Pipes shall be carefully backfilled with filter material ensuring the pipes are not damaged, distorted or displaced

1.4. Plastic pipes shall not be laid at temperatures lower than 5°C

1.5. Laying of pipe work beyond the tree pit/trench shall be in accordance with the Engineer's details & specification

2. Granular fill shall be: clean local stone shingle, nominally 10-20mmØ
- submit proposals for approval

3. Geotextile membrane: As Clause 522

3.1. Lay and wrap filter membrane around granular fill to prevent ingress of fines into pipe

525 Tree securing schedule

1. All trees shall be secured as scheduled below
2. All trees are to be secured so as to ensure that all trees remain firm and upright at all times
3. The details given below are for guidance only, and should be read in conjunction with: the tree pit details and agreed with the Landscape Architectprior to order
4. Stakes: Refer to Clause: **Q31/536** for requirements
5. Trees up to 12cm girth:

5.1. Single stake at 45 degrees, minimum: 750mm into ground

5.2. Or, vertical stake set minimum: 900mm into ground and just below first break

5.3. Type to be determined on site in liason with: CA/Landscape Architect

5.3.1. **Multistem tree, 1.8-2.1m height**:

5.4. 3No. stakes to form triangle around tree (providing mowing protection) set circa: 300mm above ground with approved strap and tie system

5.4.1. **Trees 16cm-20cm girth (excluding evergreen trees - see below)**:

5.5. Triple staked with 3No. stripped chestnut poles: - Refer to tree pit details

5.5.1. **Trees 20cm+ girth**:

5.6. Proprietary underground guying system: - **Q31/527**

5.7. System to be capable of high wind loading and secure fixing into areas of fill

5.7.1. **Evergreen Trees Large**:

5.8. Approved overhead or underground guying system

5.9. To be fully adjustable with rootball protective matting

5.9.1. **Evergreen Small**:

5.10. Approved staking/cane system to provide robust but visually unobtrusive fixing

5.11. Tie to be adjustable

527 Underground guying for

1. Description: All trees
2. Manufacturer: Platipus Ltd or equal approved
Kingsfield Business Centre
Philanthropic Road
Redhill
Surrey RH1 4DP
Tel. 01737 762300

2.1. Product reference: Submit proposals to comply with the requirements below:

3. Anchoring system: 3 no. drive-in anchors
4. Installation: - Ensure tree is positioned correctly and vertically prior to tightening guy line tensioners
   - Anchoring system to be installed strictly in accordance with the manufacturer's recommendations, including the size, number and type of kit required
   - Anchoring system to be selected to suit size of tree, ground conditions and anticipated wind loads and micro-climate conditions
   - All rootballs to be protected with protective mats (as part of the anchoring system specified above), installed in accordance with the supplier's specification
5. Additional Requirements: The Contractor should consider using: Deadman anchors where trees are planted in close proximity to underground services. **Refer also to TP01 Tree Pit details.** Refer to clause **Q31/528**

528 Deadman anchors

1. Location: As defined above and indicated on the drawings
2. Contractor to submit proposals for deadman anchors for approval
3. Deadman anchors to be secured using: - submit propposals
4. System to be capable of high wind loading and secure fixing/suport within areas of fill
5. Care to be taken during installation of deadman anchors to ensure that any lining to tree pits/trenches is not penetrated.

594 Stem wrapping

1. Trees equal to or greater than: 20cm girth to be wrapped using a proprietary reed mat (Phragmites) wrap to cover the extent of clear stem, up to 2 metres above ground level
   1.1. Wrap to be securely fastened to achieve secure fit to stem whilst allowing air to circulate
   1.2. Submit proposals for: Landscape Architect'sapproval

595 Tree ties

1. Description: Black plastic strap and buckle type with rubber spacers
2. Supplier/manufacturer: J Toms Ltd or equal approved
   7 Marley Farm
   Headcorn Road
   Smarden
   Ashford
   Kent TN27 8PJ
   2.1. Product reference: Tom Ties or equal approved
3. Installation: In accordance with supplier recommendations, ensuring method will not cause bark damage to the tree during establishment

Woodland/ matrix/ buffer zone planting - Not Used

Protecting/ maintaining/ making good defects

715 Maintenance

1. The Contractor is responsible for the maintenance of soft landscape and planting works, at no additional cost to the Contract, during:
   1.1. Progress of works on site up until Practical Completion
   - The Defects Liability Period/Maintenance Period as set out in Clause **A15/270**
2. Frequency of maintenance visits: In accordance with the agreed Maintenance Schedule. Refer also to the Landscape Management Plan
3. Scope/requirements: In accordance with the following clauses

720 Failures of planting

1. Defects due to materials or workmanship not in accordance with the Contract: Plants/ trees/ shrubs that have failed to thrive.
   1.1. Exclusions: Theft or malicious damage after completion.
   1.2. Rectification: Replace with equivalent plants/ trees/ shrubs.
2. Replacements: To match size of adjacent or nearby plants of same species or match original specification, whichever is the greater.
3. Timing of making good: During the next suitable planting season

725 Plant replacements pre practical completion

1. At Practical Completion all plants shall be: **Healthy and in pristine condition**
2. Replacement planting to make good defects Pre-Practical Completion shall be replaced immediately (or at the earliest opportunity during the next planting season as agreed with: the CA/Landscape Architect) by the Contractor at no additional cost to the Contract
3. Any plants found defective at Practical Completion shall be replaced immediately (or at the earliest opportunity during the next planting season as agreed with: the CA/Landscape Architect) by the Contractor at no additional cost to the Contract
4. Plants damaged by vandalism prior to Practical Completion shall be noted by the Contractor and shall be replaced by and at the Contractor's expense at the earliest opportunity during the planting season immediately following damage/loss
5. Any stakes, ties, guys, etc., shall be replaced as soon as possible after being found defective
6. The relevant planting rates shall be deemed to include all such costs and no additional payment will be made for defective work under any circumstances
7. Any/all replacement plants that are planted after Practical Completion, e.g. due to seasonal constraints, will be subject to a separate/new Defects Liability Period, of the same duration as originally specified (refer to Clause: A15/270), starting from the date at which the replacement planting is approved by the CA/Landscape Architect

730 Protective fencing

1. Fencing type: Contractor's choice.
2. Erection: On completion of planting.
3. Removal: Fencing will remain the property of the Contractor. Remove and refill post holes following acceptance of rectified defects

740 Cleanliness

1. Soil and arisings: Remove from hard surfaces and grassed areas.
2. General: Leave the works in a clean tidy condition at completion and after any maintenance operations.

745 Pre-practical completion maintenance

1. In accordance with the requirements for Post-Practical Completion maintenance (: **Q31/746**), except where specified otherwise
2. In particular, attention shall be paid to planted and grass areas, including cutting, weeding and watering
3. The cost of Pre-Practical Completion maintenance shall be included in the tender
4. The number of visits carried out prior to Practical Completion shall not form part of the total identified in Clause: **Q35/102**

746 Post-practical completion maintenance

1. In accordance with Section: **Q35** of this specification

750 Planting maintenance generally

1. Weed control: Maintain weed free area around each tree and shrub.
   1.1. Diameter (minimum): The larger of 1 m or the surface of original planting pit.
   1.2. Keep planting beds clear of weeds: By hoeing
2. Planted areas: Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows. Take care not to reduce depth or effect of mulch.
3. Precautions: Ensure that trees and shrubs are not damaged by use of mowers, nylon filament rotary cutters and similar powered tools.
4. Firming up: Gently firm loosened soil around trees/ shrubs. Straighten leaning trees/ shrubs.
5. Trees: Spray crown when in leaf during warm weather.
   5.1. Timing: After dusk.
6. Tree accessories: Check condition of stakes, ties, guys, guards and irrigation and ventilation systems.
   6.1. Broken or missing items: Replace.
   6.2. Loose stakes: Re-firm in the ground or replace as necessary to provide support to the tree.
   6.3. Loose guys: Re-firm anchor points and adjust as necessary to provide support to the tree.
   6.4. Ties: Adjust to accommodate growth and prevent constriction or abrasion.
   6.5. Damage to bark: Cut back neatly with sharp knife. Prevent further damage.
   6.6. Frequency of checks: As schedule
7. Watering: As required for healthy establishment, depending on weather conditions

751 Maintenance key operations

1. Watering:
2. Attention must be paid to watering all plant material, including grass, during the construction period of the works
   2.1. For requirements following Practical Completion, refer to: **Q35**
3. Carry out all watering as necessary to ensure the successful establishment of all plant material and grass areas
4. Special attention to watering is particularly required during the first spring /summer months following planting
5. Include within the tender rates for the watering of all transplants and trees (via irrigation tubes) by the use of: bowseror similar approved means
6. Include with the tender an indicative programme of watering, schedule of quantities to be applied for grass areas, shrub/herbaceous perennial areas, hedges, transplant planting and trees (litres per tree), and detailed methodology confiming machinery and water sources
7. Watering should be stopped and a report made to the: CA/Landscape Architectif the soil is seen to have become water-logged or if any symptoms of bad drainage, sour soil, or yellowing of foliage are seen.
8. Site Cleanliness:
9. The Contractor shall carry out all necessary measures to ensure that drains and plant areas are kept clear of litter and fallen leaves at all times.
10. Weed Control - Generally:
11. The Contractor shall suppress weed growth to planted areas either by hand or approved mechanical means
12. Shrub, forestry and ground cover areas shall be kept free from weed growth at all times

13. Hoe and weed all cultivated areas, removing weeds to tip as required to maintain a clean and tidy appearance
14. All perennial weeds, unless instructed otherwise, shall be removed and their roots destroyed.
15. Growing plants shall not be disturbed by hoeing
16. All planted areas are to be maintained weed free by mechanical or manual methods
17. The use of herbicides may only be used if so directed by the: CA
    17.1. Herbicides shall be applied strictly in accordance with the manufacturer's instructions
    17.2. The Contact herbicide shall contain ingredients which do not persist in the soil in a toxic form

760 Planting maintenance – pruning

1. General: Prune to promote healthy growth and natural shape.
    1.1. Dead, dying, diseased wood and suckers: Remove.
    1.2. Timing: In accordance with the agreed maintenance schedule and as appropriate to the species
    1.3. Trees: Favour a single central leading shoot.
2. Arisings: Remove.

772 Pest and diseases

1. Monitor all plant material for any pests and diseases and report to the: CA of any symptoms and proposed recommendations/actions
2. Allow for treatment of any problematic plant disease or erradication of pests via approved means

780 Maintenance instructions

1. General: Before end of the maintenance period, submit printed instructions recommending procedures to be established by the Employer for maintenance of the planting work for one full year: Provide a schedule of any ongoing maintenance problems experienced during the rectification period.

790 Final mulching

1. Timing: At end of the maintenance period.
2. Watering: Ensure that soil is thoroughly moistened prior to remulching, applying water where necessary.
3. Planting beds: Remulch.
4. Depth (minimum): In accordance with the specified depth
5. Trees: Remulch.
6. Depth (minimum): 75 mm

Plant procurement - advance procurement & contract growing

800 Advance procurement / contract growing - scope of works

1. The works generally comprise, but are not limited to, the following:
    1.1. The advance procurement /contract growing of plant material as specified and scheduled on the Contract documents listed in Clause **Q31/805** below
    1.2. The arrangement and coordination of all Nursery visits/inspections as deemed necessary by this document
    1.3. The holding/storage of plant material, including all maintenance operations as necessary to maintain the plants in a healthy, vigorous and pristine condition until call up/dispatch
    1.4. Dispatch and delivery of plant material to site

805 Advance procurement / contract growing - contract schedules & drawings

1. **Document No.Title**
2. AGV-GRA-BZ-XX-SH-L-009001
3. AGV-GRA-BZ-XX-DR-L-005001

806 Advance procurement / contract growing - nomenclature

1. Plant names shall conform to the nomenclature of 'Standardised Plant Names' set out within BS3936: *Nursery Stock* series.
2. Names of varieties not listed therein shall conform generally with names accepted in the nursery trade.
3. Clonal types shall be true.

807 Advance procurement / contract growing - measurement

1. Plants shall be measured in units of girth, height and clear stem as specified on the contract schedules.
2. The height and clear stem shall be the fair average between the minimum and maximum sizes specified.

810 Advance procurement / contract growing - workmanship & deliveries

1. All materials and horticultural workmanship shall be the best of their kind, and comply with the specification.
2. All nursery staff shall be competent and fully experienced in all aspects of the work on which they are engaged.
3. The nursery shall include in their tender for all necessary works and purchase of materials that they deem necessary to meet the specified standard
4. The nursery shall ensure that all plant material is in full compliance with this document and conforms to the specified sizes in time for the required planting season

815 Advance procurement / contract growing - start date on site/deliveries

1. This shall be confirmed by: CA
2. The nursery is deemed to have included within the tender for staged deliveries.
3. Within their tender, the Nursery shall include for phased and partial delivery of the various schedules.
4. The Nursery shall assume deliveries are to be completed in accordance with the following provisional programme:
5. TBC

820 Advance procurement / contract growing - co-ordination & maintenance (pre-delivery)

1. The Nursery shall be responsible for all tasks necessary to maintain the health and vigor of plants throughout the duration of the contract until delivery to site/acceptance by: Landscape Contractor/CA
2. It will be the responsibility of the Contractor to make direct contact with the Nursery and to make all necessary arrangements for safe and secure deliveries of plant material by the Nursery.
3. The: CA will inform the Nursery of the name and address of the Contractor and will forward the necessary plant order and delivery notice.
4. The Contractor shall give the supply Nursery a minimum of: 14 days notice of delivery, together with any restrictions of access to the site.

5. On receipt of the Delivery Notice, the Nursery shall forthwith confirm that delivery will be made at the required time and shall inform the Contractor of the type and number of mechanical aids required to off-load the plants.

825 Advance procurement / contract growing - sourcing

1. The Nursery shall include within its tender return:
   1.1. A written notice of suppliers and the sources of supply
   1.2. A list of names and addresses of all anticipated supply nurseries from whom it is intended to obtain materials necessary for the execution of this contract. Within two weeks of being appointed, the Nursery shall submit a definitive list of all suppliers and sources.
2. The: Landscape Architect & Landscape Contractorrequire to inspect, approve or reject as necessary, all plant material at the Nursery/in the field with the objective to selecting the very best materials from a presented range.
3. Special attention shall be given to the selection of trees and it is anticipated that all these shall be tagged in ‘’the field’ and at the earliest opportunity in order to secure the highest quality stock.
4. The Nursery shall coordinate all plant inspections and liaise with the: Landscape Contractorand supply nurseries in order to enable all inspections to be completed in time so as to to ensure the satisfactory procurement of plant stock
5. The Nursery shall include within its tender for all travel and accommodation expenses, as deemed necessary, to meet the specified inspection requirements defined above. The Nursery shall include for inspection/attendance by: 3No. design team members, eg. Landscape Architect & Landscape Contractor & Clients Represenative
6. If during inspection no suitable stock is presented, then the tender is deemed to have allowed for any subsequent visits and associated expenses until such stock is procured.

830 Advance procurement / contract growing - inspections (pre-delivery)

1. The Client, or any person nominated by the Client, may inspect and monitor the plants at the nursery at all reasonable times, as required, on giving reasonable notice to the nursery.
2. Such inspection or monitoring shall not be interpreted as acceptance of the plants.

835 Advance procurement / contract growing - inspections (delivery)

1. The Contractor shall supervise the unloading of the plants and shall inspect carefully all plants on delivery to the site and ensure themselves of the health and vigor of the specimens before accepting them
2. If the Contractor is reasonably of the opinion that the plants are not in accordance with the terms and conditions of this contract, or are not of an acceptable quality, or are not fit for their purpose, they shall be rejected by the Contractor immediately issuing a written notice to: CA/Nursery
3. The Nursery shall reload rejected plants and remove them immediately from site at their own cost
4. Upon rejection of any plants, the Contractor shall immediately confirm in writing to the Nursery the number and type of plants rejected (the ‘Rejection Notice’) and the Nursery shall, within: Five working days of such notice, deliver replacement plants which shall be to the satisfaction of Landscape Architect & Landscape Contractor
5. All plants off loaded by the Contractor shall be deemed to be accepted by the Contractor

840 Advance procurement / contract growing - plant failure

1. The Nursery shall be liable to replace plants which die or fail to thrive as a result of latent diseases, or damage to/contamination of the rootball, which is present but not evident by careful inspection by: Landscape Contractorwhen off loading plants from the supplier.
2. The Contractor shall be responsible for replacing all other losses (after delivery/acceptance) from whatever cause(s) other than those stated above.

845 Advance procurement / contract growing - rejected plants

1. The Landscape Architect reserves the right to reject material, which will, in their opinion, fail to meet the specified size or quality by the supply date.
2. The nursery shall supply alternative stock at their cost.
3. Plants as inspected, and considered by the: Landscape Architect/Landscape Contractor not to meet the standards set out within this document, shall be replaced by the Nursery with plants of the required standard at the Nursery's expense and all within fiveworking days of notification.

850 Advance procurement / contract growing - approved samples

1. Prior to bulk ordering, potting up, etcc., if deemed necessary by: Landscape Architect , the Nursery shall make provision for supplying to site a representative sample of the bulk quantity plant species for approval.
2. The samples are to give a fair indication of the quality of the bulk intended to be supplied.
3. Approved samples shall be set aside, maintained in a healthy and vigorous condition, so all other plants may be judged against them.

855 Advance procurement / contract growing - transporting & handling

1. Generally all plants shall be lifted, handled, packaged and stored all in accordance with the HTA: *National Plant Specification* and CPSE *Plant Supply and Establishment*, except where modified by the following clauses.
    1.1. In particular all tree trunks are to be adequately protected and compression damage must be avoided, e.g. tree containers must not to rest on adjacent tree trunks
    1.2. No deliveries to site shall be carried out on Mondays.
    1.3. Loading shall be undertaken immediately prior to delivery, i.e. plants must not to be stored/loaded on lorries for a duration exceeding 16 hours.
    1.4. All packaging for either container grown or open ground plants shall be adequate to protect the plants and prevent their heating, drying out or damage of any kind during transportation.
    1.5. Delicate foliage shrubs and herbaceous plants shall be transported in Dutch trays or similar.
    1.6. Bulbs shall be delivered in vermin proof containers with individual species and varieties clearly labeled and separate.
    1.7. All plants must be in a turgid state and stacked in such a way that breakage or crushing by the weight of the plants above or securing ropes will not occur during transit.
    1.8. The plants shall be loaded in a manner suitable to facilitate simple unloading techniques that are not labour intensive and minimise the risk of damage.
2. The Nursery shall ensure that all bare root trees, shrubs and transplants are root dipped in an approved microrrhizal inoculant root dip solution in accordance manufacturer's recommendations. Refer to Clause: **Q31/330**
    2.1. Root dipping must take place immediately prior to transportation.
3. Unless otherwise agreed, the cost of any plants shall be deemed to include packaging and carriage to the site.

860 Advance procurement / contract growing - method statement

1. The Nursery shall submit with their tender a detailed method statement defining how they are to achieve the requirements of this document.
2. In particular, the method statement should address the following items:
    2.1. Key personnel and qualifications
    2.2. Procurement - sources and suppliers of materials and anticipated number of inspection visits required.
    2.3. Potting up, growing media specification, fertiliser regimes, etc.

2.4. Plant quantities, i.e. strategy allowance for failures/rejects during growing season

2.5. Control of pest and diseases

2.6. Specialist management regimes, i.e. training of trees including framework details (temporary and permanent) to be adopted by the Landscape Contractor.

2.7. General maintenance & storage of plant material at the nursery

2.8. Programme related issues, e.g. programming of specific tasks to ensure plants are at established and at specified sizes or larger when required on site. The phasing of tasks related to herbaceous and wildflower plants will be of particular importance.

2.9. Acclimatisation of stock, i.e. trees sourced from outside northern European nurseries, if relevant

865 Advance procurement / contract growing - alternative specification

1. Where a particular plant specification is scheduled or implied by this document, and the nursery is not sure that the preference specified will satisfy the requirements of the document, then the nursery shall make alternative proposals when submitting their price, e.g. increasing container size to attain the specified heights.

870 Advance procurement / contract growing - excluded works

1. The nursery shall, when submitting their tender, clearly describe any work necessary for the proper completion of the contract which has not been included for in the Tender and which the nursery may require to be executed and paid for by others
2. Any such work not specifically stated & described shall be deemed to have been included for in their Tender.

875 Advance procurement / contract growing - maintenance at the nursery

1. The Nursery shall make provision for, and include for, all maintenance tasks required to maintain the health and vigour of all plant stock until it is delivered to site.
2. As well as general maintenance tasks, e.g. watering, fertilising, control of pests and weeding, etc., it may be necessary to carry out the following:
   2.1. Potting on stock to avoid plants becoming pot bound. If necessary to maintain the health of the plant, this is deemed to include for potting up into containers larger than specified.
   2.2. Tree canopy management
   2.3. Shrub pruning
   2.4. Thinning/division of wildflowers and/or aquatics
3. All stock shall be held on nursery beds, i.e. within clearly defined areas, and maintained to good horticultural practice in order to provide optimum growing conditions.
4. Each tree and batch of shrubs shall be legibly labeled in the name of: Clienton a waterproof label, with its generic and specific name.
   4.1. Any plants so marked shall not be disposed of to any third party without the consent of Client .
   4.2. All plants shall be labeled true to name for the duration of the contract, and labelled individually upon delivery.
5. **The nursery shall keep the Contract Administrator fully informed of any decline or anticipated decline of stock that may result from changes to the delivery programme set out with this document.**

880 Advance procurement / contract growing - reserve stock

1. The nursery is deemed to have included for the reservation of circa: 10% stock surplus stock in order to ensure that if failure occurs during growing on, or specimens are damaged in transit, replacement stock will be immediately available.
2. The nursery shall confirm the replacement strategy within their tender return

885 Advance procurement / contract growing - cold storage

1. When requested, the nursery/supplier shall temporarily place the stock in a cold store
2. All operations in this respect shall be carried out according to good horticultural practice

890 Advance procurement / contract growing - defects liability

1. In the event of stock losses occurring in each and every single species supplied being greater than: 10 % within 12months of the issue of a Certificate of Practical Completion (or from the date of similar failures), the supplier/nursery shall, within 28 (twenty eight)days of being requested to do so by Landscape Architect/Landscape Contractor:
   1.1. Supply replacement stock in accordance with the specification at their own expense
   1.2. Or, shall notify CA that they is unable to do so, whereupon the Client /Landscape Contractor shall be entitled to obtain from any other source such quality of the stock as the supplier has been unable to supply
2. The costs thereof, including any consequential costs, shall be at the supplier’s/nursery's expense.
3. Losses due to theft or malicious or accidental vandalism are excluded from this liability.
4. In the assessment of losses, due regard will be given to extreme and/or unusual climatic factors and to the horticultural standards of the planting and maintenance operations.

Ω End of Section

Q35
Landscape maintenance

Clauses - Not Used

To be read with preliminaries/ general conditions.

5 Section index

General requirements

10 Landscape maintenance - scope of specification

1. The following clauses set out the requirements for: Post-Practical Completion landscape maintenance works only, including the following:
   - Hard and soft landscape to the extents of Phase 2A works
   - Refer also to the approved Agar Grove Regeneration Landscape Management Plan

20 General requirements

1. Duration: For the entirety of the Defects Liability Period and Maintenance Period as defined in Clause **A15/270**
2. Scope: Hard & soft landscape works implemented under the Contract, as defined within this Specification and on the Contract drawings
3. Definition: ‘Maintenance' as applied to work included in this Contract will include the following:
4. - all operations necessary to ensure the successful establishment of, and ongoing proper growth of, all plants within the works
   - all operations necessary to keep the works in a neat & tidy condition
   - all operations necessary to keep all hard landscape elements, e.g. paving, kerbs, walls, drainage channels, etc., in a clean, safe & sound condition
   - all operations necessary to keep all street furniture elements, e.g. seating, play equipment, bins, handrails, balustrades, tree grilles, fencing, signage, etc., in a clean, safe & fully-functioning condition
   - all operations necessary to keep all external lighting elements in a clean, safe & fully-functioning condition
   - regular and thorough inspections of all hard and soft landscape works implemented under this contract

30 Site cleanliness

1. The Contractor shall take all necessary measures to ensure that all hard and soft landscape areas within the Contract Works, including planted areas and drains, are kept clear of litter and fallen leaves at all times

40 Method statement

1. The Contractor shall submit a proposed method statement for carrying out the landscape maintenance works to the: CA/Landscape Architectfor approval

50 Post-practical completion maintenance - frequency of visits

1. The Contractor is responsible for making regular maintenance visits to the site
2. The Contractor shall carry out minimum of: 35 visits per year, giving the Landscape Architect 72 (seventytwo) hoursnotice of the intention to commence work on each operation
3. The number of maintenance visits shall be increased as necessary to maintain the specified standards
4. The maximum intervals between visits by the Contractor shall be:
   4.1. April to October (inclusive): 7days (to an agreed programme)
   4.2. November to February (inclusive): 20days (to an agreed programme)

55 Maintenance reports

1. Within: two working days of each maintenance visit the Landscape Contractor shall submit to CA record report outlining the condition of the works, a schedule of the works carried out and any items that require the attention of, or the approval of CA/Landscape Architect, including drainage problems, areas of suspected soil toxicity or vandalism.
2. Payment for maintenance work will only be certified for correctly recorded, approved work in accordance with this clause.

60 Post-practical completion maintenance - inspections

1. At the end of the first growing season (Sept/Oct) of the Defects Liability Period (i.e. within 12 months of the start of the Defects Liability Period), the: CA/Landscape Architect and the Landscape Contractorshall carry out a joint inspection of the works
2. At the end of the second growing season (Sept/Oct) of the Defects Liability Period (i.e. between 12 & 24 months of the start of the Defects Liability Period) the: CA/Landscape Architect and the Landscape Contractorshall carry out a second and final inspection of the works

70 Post-practical completion - defects & replacements

1. During Defects Liability Period: Any materials, trees or other plants which are found to be defective (e.g. does not show leaf, make adequate growth, or shows signs of excessive stress) during the Defects Liability Period must be replaced by the Contractor, at no additional cost to the Contract, during the planting season immediately following their loss
   1.1. Any/all replacement plants will be subject to a separate/new Defects Liability Period, of the same duration as originally specified (refer to Clause: **A15/270**), starting from the date at which the replacement planting is approved by the CA/Landscape Architect
2. Vandalism: : CA/Landscape Architecture
3. Any stakes, ties, guys, etc., found to be defective are to be replaced as soon as possible
4. The relevant planting rates shall be deemed to include all such costs and no additional payment will be made for defective work under any circumstances
5. Any plants subject to a 24 (twenty four) month Defects Liability Period (as defined in Clause: **A15/270**) that fail during the first 12 (twelve) month period must be replaced by the 31st December of that same year, or the planting season immediately following their loss, whichever is earlier

80 Labour

1. The Contractor shall employ an approved competent Supervisor on the works, who is to be present during all maintenance visits, and any instruction given to the Supervisor by the: CA/Landscape Architect shall be deemed to have been given to the Contractor

2. All work people employed on site by the Contractor shall be competent and experienced in all aspects of work on which they are engaged
3. The Contractor's Tender shall include a preliminary maintenance programme confirming the minimum number of staff employed on site during each maintenance visit

90 Weed control

1. The Contractor shall ensure that all hard and soft landscape areas within the Contract Works are maintained in a neat, weed-free condition
2. The Contractor shall suppress weed growth to planted areas: either by hand or by approved mechanical means
   2.1. Remove weeds to tip as required
3. All perennial weeds, unless instructed otherwise, shall be removed and their roots destroyed
4. Growing plants shall not be disturbed by hoeing
5. Herbicides may only be used if approved by: CA
   5.1. Submit proposals for approval
   5.2. Herbicides must be applied strictly in accordance with the manufacturer's instructions
   5.3. Herbicides containing ingredients that persist in the soil in a toxic form must not be used
6. Adjacent plants, trees & grass: Do not damage
7. Refer also to the following clauses for further requirements: **Q35/95**, **Q35/185**, **Q35/340-345**, **Q35/645 - 670** & **Q35/897-899**

95 Harmful, injurious and/or non-native invasive weeds

1. The Contractor is to ensure that harmful, injurious and/or non-native invasive weeds, as defined by: Schedule 9 of the *Wildlife and Countryside Act 1981 (Variation of Schedule 9) England and Wales Order 2010* and within the *Weed Act 1959*, Water Framework Directive *Alien Species Alarm List*, including (but not limited to) the following, are prevented from establishing within the Works:
2. - Common ragwort (Senecia jacobaea)
   - Spear thistle (Cirsium vulgare)
   - Creeping or field thistle (Cirsium arvense)
   - Broad-leaved dock (Rumex obtusifolius)
   - Curled dock (Rumex crispus)
   - Japanese knotweed (Fallopia japonica/Polygonum cuspidatum)
   - Giant hogweed (Heracleum mantegazzianum)
   - Himalayan balsam (Impatiens glandulifera)
   - Rhododendron (Rhododendron ponticum)
   - Stonecrop (Crassula helmsii)
   - Water fern/Fairy fern (Azolla filiculoides)
   - Parrot's feather (Myriophyllum aquaticum)
   - Floating pennywort (Hydrocotyle ranunculoides)
   - Floating water primrose (Ludwigia peploides)
   - Fanwort (Cabomba caroliniana)
   - Canadian pondweed (Elodea canadensis)
3. Contractor to notify: CA immediately should any harmful, injurious and/or non-native invasive weeds be found within the works
4. Contractor to submit proposals for control/removal of harmful, injurious and/or non-native invasive weeds to: CA for approval
   4.1. Control/removal to be carried out by suitably qualified (specialist) personnel
   4.2. Contractor to notify Environment Agency as required/appropriate
5. This clause should be read in conjunction with Clause(s): **Q35/90** above

Generally

100 Seasonal constraints

1. Pruning to be carried out in the appropriate season for each species
   1.1. Winter pruning must not be carried out during frosting weather
2. Further seasonal requirements/constraints are set out in individual clauses including, but not limited to,: **Q35/420**, **543**, **570**, **580** & **605**

105A Maintenance objectives

1. Refer to the approved phase 2a landscape management plan

110 Notice

1. Give notice before
   1.1. Application of herbicide.
   1.2. Application of fertilizer.
   1.3. Watering.
   1.4. Each site maintenance visit.
2. Period of notice: 2 weeks

130 Reinstatement

1. Damage or disturbance to soil structure, planting, grass, fencing, hard landscaping, structures or buildings: Reinstate to original condition.

135 Recultivation

1. Allow for the re-cultivation of planting areas, by approved hand or machinery means, that have become compacted due to any cause whatsoever
   1.1. To gentle cambers, without hollows
2. Remove/reapply mulch as required to maintain specified depth/effect
3. Submit proposals for approval

140 Control of mammalian pests

1. Specialist firms: Submit proposals
   1.1. Method: Submit proposals

145 Control of invasive animal species

1. Specialist firms: Submit proposals
2. Species: Brown rat, Canada goose
3. Location: Whole site
4. Method: Submit proposals

160 Water restrictions

1. General: If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

165 Watering general

1. Attention must be paid to watering all soft landscape areas/plants, including grass areas, during the maintenance period of the works

2. Carry out all watering as necessary to ensure the successful establishment of all plant material and grass areas
3. Special attention to watering is particularly required during the first spring/summer months following planting
4. Include within the Tender:
    4.1. rates for the watering of each planting typology, e.g.: ornamental planting, woodland planting, grass areas, trees, etc., as defined on the Contract Drawings
    4.2. an indicative programme of watering
    4.3. a schedule of quantities to be applied for each planting typology
    4.4. a detailed methodology confirming machinery and water sources
5. Watering shall be stopped and a report made to: CA/Landscape Architectif the soil is seen to have become water-logged or if any symptoms of bad drainage, sour soil or yellowing of foliage are seen

167B Irrigation/watering supply

1. For roof level irrigation please refer to the Architectural and M+E Specifications. External taps will be provided for manual watering of the ground level landscape: will be installed as part of this Contract and will be available to the Contractor for landscape maintenance purposes only
    1.1. in accordance with approved quantities/schedules
2. Refer to: CA & M+E Engineer's details and specificationfor futher details/requirements

170 Disposal of arisings

1. General: Unless specified otherwise, dispose of arisings as follows:
    1.1. Biodegradable arisings: Remove to recycling facility
    1.2. Grass cuttings: Remove to recycling facility
    1.3. Tree roots and stumps: Remove from site
    1.4. Shrub and tree prunings: Remove to recycling facility
    1.5. Litter and nonbiodegradable arisings: Remove from site

175 Disposal of arisings

1. General: Unless specified otherwise, dispose of arisings as follows: Remove from site.

180 Chipping or shredding

1. General: Not permitted on site.

181 Mechanical equipment

1. General: Minimize.
2. Prohibited equipment: Chippers, leaf blowers, litter vacuums
3. Timing: TBC

185 Hand weeding

1. General: Remove weeds entirely, including roots
2. Disturbance: Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible
3. Completion: Rake area to a neat, clean condition
4. Mulch: Reinstate to original depth

190 Litter

1. Extraneous rubbish not arising from the contract work: Collect and remove from site.

195 Protection of existing grass

1. General: Protect areas affected by maintenance operations using boards/tarpaulins. Do not place excavated or imported materials directly on grass.

197 Cleanliness

1. Soil and arisings: Remove from hard surfaces.
2. General: Leave the works in a clean, tidy condition at completion and after any maintenance operations.

Grassed areas - Not Used

Grass seeding & turf areas

250 Leaf removal

1. Operations: Collect fallen leaves.
2. Special requirements: Remove by hand raking
3. Disposal: Remove from site for recycling

345 Control of japanese knotweed

1. Operations: Spot treat in June and September during suitable weather conditions and when plants are growing vigorously.
2. Herbicide: In accordance with the Environment Agency 'Managing Japanese knotweed on development sites. The knotweed code of practice'
3. Application: In accordance with the Environment Agency 'Managing Japanese knotweed on development sites. The knotweed code of practice'
4. Arisings: In accordance with the Environment Agency 'Managing Japanese knotweed on development sites. The knotweed code of practice'

350 Fertilizer - spring application

1. Type: Organic
2. Application rate: 60 g/m² or in accordance with supplier recommendations

360 Fertilizer - autumn application

1. Type: Organic
2. Application rate: 60 g/m² or in accordance with supplier recommendations

Flower beds/ seasonal beddings - Not Used

Ornamental planting

400 Ornamental planting - introduction

1. The following clauses cover the maintenance of areas of Ornamental Planting including, but not limited to, the following:
2. - Ornamental shrub planting- Ornamental grass & fern planting- Herbaceous perennial planting- Planting beds of annuals- Bulb planting
3. The: *Ornamental Planting* clauses should be read in conjunction with clauses set out within other planting typology sections, e.g. *Grass Seeding & Turf Areas*, *Structure Planting*, etc.

410 Top-up mulch

1. Maintain (at all times) mulch areas to their original specified depths
2. Top-up mulch to meet requirements of original mulch specification
   2.1. Refer to Clause: Q31/487, 488

420 Bulbs & herbaceous planting - cutting back & dead-heading

1. Bulbs and herbaceous perennials shall be dead headed at a time and frequency appropriate to their species
2. Each autumn, or as appropriate to each plant, withered or dead herbaceous material shall be cut out of the plant (unless directed otherwise) and removed from site to keep each plant in a tidy condition

430 Reinstatement of ornamental planting areas

1. Dead and damaged plants: Remove & replace
2. Mulch/ matting materials:
   2.1. Carefully move to one side and dig over the soil, leaving it fit for replanting
3. Do not disturb roots of adjacent plants
4. Replacement plants:
   4.1. Use pits and plants: To original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater
   4.2. Additional requirements: Submit details and cost of plants before ordering
5. Dressing: Slow release fertilizer:
   5.1. Type: Organic
   5.2. Application rate: As manufacturer's recommendations

460 Beds of perennials or perennials and annuals

1. Plant supports: Stake and tie plants using: flower canes
   1.1. Length: To suit plant height
   1.2. Maintain throughout the growing season.
2. Gaps in planting: Refill by replanting.
3. Watering:
   3.1. New plants: Before and after planting out.
   3.2. Ongoing: As necessary for the continued thriving of all planting.
4. Operations at end of growing season:
   4.1. Trim: Older flowering stems of herbaceous perennials.
   4.2. Remove: Redundant plant supports, litter, debris and arisings.
   4.3. Cultivate: Fork over the soil, taking care not to cause undue disturbance to plants.
   4.4. Top dress: Apply: sanitized and stabilized compost top dressing

Shrubs/trees/hedges

501 Structure planting - introduction

1. The following clauses cover the maintenance of areas of Structure Planting including, but not limited to, the following:
2. - Woodland and/or scrub transplant planting- Non-ornamental shrub planting- Hedge planting- Tree planting

3. The: *Structure Planting* clauses should be read in conjunction with clauses set out within other planting typology sections, e.g. *Grass Seeding & Turf Areas*, *Ornamental Planting*, etc.

502 Establishment of new planting – fertilizer

1. Time of year: March or April.
2. Type: Organic
3. Spreading: Spread evenly. Carefully lift and replace any mulch materials.
   3.1. Application rate: As manufacturer's recommendations

505 Tree stakes & ties/fixings

1. Trees stakes shall be maintained secure and vertical
2. Blocks and belts shall be maintained secure but not over tight
3. The Contractor shall monitor the stems of staked trees and take any action necessary to prevent damage

510 Tree stakes and ties

1. Inspection/ Maintenance times: At each visit and after periods of high winds
2. Stakes
   2.1. Replace loose, broken or decayed stakes to original specification.
   2.2. If longer than half of clear tree stem height, cut to this height in spring. Retie to tree firmly but not tightly with a single tie.
3. Ties: Adjust, refix or replace loose or defective ties, allowing for growth and to prevent chafing.
   3.1. Where chafing has occurred, reposition or replace ties to prevent further chafing.
4. Removal of stakes and ties: During spring when no longer required to support the tree
   4.1. Fill stake holes with lightly compacted soil.

515 Tree guy wires

1. Inspection/ Maintenance times: Immediately after strong winds
2. Operations
   2.1. Replace or resecure loose or missing guy wires.
   2.2. Adjust to suit stem growth and to provide correct and uniform tension.
3. Removal: During spring when no longer required to support the tree

516 Adjustment of tree guys, ties & training wires

1. Tree anchors to be maintained tight at all times
2. Anchors to be re-tensioned periodically to prevent excessive wind rock and to compensate for settlement
3. Protective covering to be checked regularly and made good where necessary

520 Refirming of trees and shrubs

1. Timing: After strong winds, frost heave and other disturbances.
2. Refirming: Tread around the base until firmly bedded.
3. Collars in soil at base of tree stems, created by tree movement: Break up by fork, avoiding damage to roots. Backfill with topsoil and refirm.

527 Aeration pipes

1. Aeration pipes to be kept fully operational at all times

2. To be kept free of ingress of any material
3. Replace damaged or missing caps to pipes

537 Nesting wild birds

1. Survey: Not required
2. Accidental disturbance: Report immediately.

540 Pruning generally

1. Pruning: In accordance with good horticultural and arboricultural practice.
    1.1. Removing branches: Do not damage or tear the stem or bark.
    1.2. Wounds: Keep as small as possible and cut cleanly back to sound wood.
    1.3. Cutting: Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area.
    1.4. Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
2. Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well balanced natural appearance.
3. Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
4. Disease or infection: Give notice if detected.
5. Growth retardants, fungicide or pruning sealant: Do not use unless instructed.

542 Sympathetic pruning

1. The Contractor shall be experienced with pruning techniques and plant responses to pruning
2. Pruning shall be carried out with due regard to natural growth patterns, and shall accentuate natural tendencies
3. Allow for the cutting back or light pruning of shrubs to encourage correct shaping and bushiness
4. Where plants have out grown their position and hard cutting back is required, pruning shall reflect the natural form of the plant (unless specified otherwise) and shall: **not** be clipped to a formal shape (forming straight lines and edges), unless specified otherwise

543 Pruning - seasonal requirements

1. Light pruning to control spread, the removal of obstacles and the removal and repair of damage may occur at any time of year, and shall be carried out at the time it first becomes apparent.
2. Branches that hang too low from the weight of leaves or fruit may be thinned during the growing season.
3. Formative pruning and crown management for broad leaved trees shall be carried out in the dormant season between September and February.
4. Species that are prone to bleeding, particularly Carpinus, Betula and Acer species shall only be pruned in late July or August.

545 Pruning of excessive overhang

1. Timing: Annually or as instructed for safety reasons
2. Operations: Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires.
3. Special requirements: Allow ground cover plants to partially overlap paths and lawns

550 Pruning of excessive height

1. Timing: As instructed

2. Operations: Remove excessive height As instructed.

555 Pruning trees and shrubs

1. Standard: To BS 7370-4.
2. Special requirements: None

570 Formative pruning of young trees

1. Standard: Type and timing of pruning operations to suit the plant species.
2. Time of year: Do not prune during the late winter/ early spring sap flow period.
3. Young trees up to 4 m high
    3.1. Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well balanced head and ensure the development of a single strong leader.
    3.2. Remove duplicated branches and potentially weak or tight forks. In each case cut back to live wood.
4. Whips or feathered trees: Do not prune.
5. Operatives: Approved specialist contractor

575 Pruning ornamental shrubs

1. General: Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour.
2. Suckers: Remove by cutting back level with the source stem or root.

580 Pruning flowering species of shrubs and roses

1. Time of year
    1.1. Winter flowering shrubs: Spring.
    1.2. Shrubs flowering between March and July: Immediately after the flowering period.
    1.3. Shrubs flowering between July and October: Back to old wood in winter.
    1.4. Rose bushes: Early spring to encourage basal growths and a balanced, compact habit.

590 Pruning particular species

1. Species to be pruned to separate specific instructions: Shrub species to private driveways/public realm to be maintained to a consistent plinth, heights to meet requirements of Plant Schedules.

600 Trimming rapidly establishing hedges

1. General: Allow to reach planned height as rapidly as possible.
    1.1. Form: Trim back lateral branches moderately.

605 Trimming slowly establishing hedges

1. Operations
    1.1. Timing: Cut back hard in June and September to encourage bushy growth down to ground level.
    1.2. Form: Allow to reach planned dimensions only by gradual degrees, depending on growth rate and habit.

620 Removal of dead plant material

1. Operations: At the end of the growing season, check all shrubs and remove all dead foliage, dead wood, and broken or damaged branches and stems.

625 Climbing plants

1. Pruning: Remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.
2. Insecure growth: Attach to supporting wires or structures using 1 mm diameter black plastics coated steel wire.
3. Supporting structures: Check and repair as necessary.

630 Dead and diseased plants

1. Removal: Within 1 week of notification
2. Replacement: In the next suitable planting season unless instructed otherwise in accordance with the agreed programme

632 Reinstatement of structure planting areas

1. Dead and damaged plants: Remove
2. Mulch/ matting materials:
    2.1. Carefully move to one side and dig over the soil, leaving it fit for replanting
3. Do not disturb roots of adjacent plants
4. Replacement plants:
    4.1. Use pits and plants: To original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater
    4.2. Additional requirements: Submit details and cost of plants before ordering
5. Dressing: Slow release fertilizer:
    5.1. Type: Organic
    5.2. Application rate: As manufacturer's recommendations

641 Thinning and re-firming

1. Remove by approved means any plants which are out-competing other plants and adversely affecting the development of adjoining plants
    1.1. Including plants identified for removal/thinning by: the Landscape Architect
    1.2. Submit proposals to: Landscape Architectfor approval
2. All plant materials shall be re-firmed in the spring following planting
    2.1. The Landscape Contractor shall ensure that all plants loosened due to late frosts, strong winds or surface water movement shall be firmed as required

655 Weed cutting by hand or machine

1. Undesirable grass, brambles and herbaceous growth: Cut down cleanly to a maximum height of 25 mm.
2. Herbicides: Give notice before use - see also Clause 657. Note preference for hand/mechanical operation only

657 Herbicide to kill regrowth

1. Type: Suitable foliar acting herbicide to kill regrowth.
2. Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

675 Digging over

1. General: Dig over beds. Do not damage existing plants, bulbs and roots.
    1.1. Depth of dig (minimum): 75 mm

680 Soil aeration

1. Compacted soil surfaces
    1.1. Prick up: To aerate the soil of root areas and break surface crust.
    1.2. Size of lumps: Reduce to crumb and level off.
    1.3. Damage: Do not damage plants and their roots.

685 Soil level adjustment

1. Level of soil/mulch at edges of beds: Reduce to 50 mm below adjacent grass or hard surface.
    1.1. Arisings (if any): Spread evenly over the bed.

690 Maintenance of loose mulch

1. Thickness (minimum): 75 mm
    1.1. Top up: Every 3 months
2. Mulch spill on adjacent areas: Remove weeds and rubbish and return to planted area.
3. Weeding: Remove weeds growing on or in mulch by hand weeding.

695 Fertilizing established trees and shrubs

1. Time of year: After flowering and in accordance with the approved Landscape Management Plan
2. Type of fertilizer: Organic
3. Application: Spread evenly.
    3.1. Rate: As manufacturer's recommendations

700 Snow removal from shrubs/ trees

1. Standard: To BS 7370-4.
2. Plants subject to snow removal: As instructed
3. Timing: When instructed

705 Winter leaf removal

1. Operations: Take down temporary leaf fences. Collect accumulations of drifted leaves from the vicinity and from planting beds.
2. Arisings: Distribute evenly over all planting beds

Tree work

805 Tree work generally

1. Identification: Before starting work agree which trees, shrubs and hedges are to be removed or pruned
2. Protection: Avoid damage to neighbouring trees, plants and property
3. Standards: To BS 3998 and Health & Safety Executive (HSE) 'Forestry and arboriculture safety leaflets'
4. Removing branches: Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater
5. Appearance: Leave trees with a well balanced natural appearance
6. Chain saw work: Operatives must hold a Certificate of Competence
7. Tree work: To be carried out by an approved member of the Arboricultural Association
8. Frequency: Canopy management to be carried out: a minimum of once per annum
9. Timing: Canopy management to be carried out in the appropriate season for each species

9.1. Avoid carrying out winter pruning in frosty weather

815 Additional work

1. Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

820 Prevention of wound bleeding

1. Standard: To BS 3998.

825 Prevention of disease transmission

1. Standard: To BS 3998.

832 Cleaning out and deadwooding

1. Remove & dispose of: - Dead, dying, or diseased wood, broken branches, limbs and stubs
   - Water shoots, epicormic growths or suckers occurring around the base of trees
   - Fungal growths and fruiting bodies
   - Rubbish, wind blown or accumulated in branch forks
   - Wires, clamps, boards and metal objects, if removable without causing further damage and not part of a support structure that is to be retained
   - Other unwanted objects, e.g. tree houses, swings

   1.1. Climbing plants: Seek approval

835 Cutting and pruning generally

1. Tools: Appropriate, well maintained and sharp.
2. Final pruning cuts

   2.1. Chainsaws: Do not use on branches of less than 50 mm diameter.

   2.2. Hand saws: Form a smooth cut surface.

   2.3. Anvil type secateurs: Do not use.
3. Removing branches: Do not damage or tear the stem.
4. Wounds: Keep as small as possible, cut cleanly back to sound wood leaving a smooth surface, and angled so that water will not collect on the cut area.
5. Cutting: Cut at a fork or at the main stem to avoid stumps wherever possible.
6. Large branches: Remove only with prior approval

   6.1. Remove in small sections and lower to ground with ropes and slings.
7. Dead branches and stubs: When removing, do not cut into live wood.
8. Unsafe branches: Remove epicormic shoots and potentially weak forks that could fail in adverse weather conditions.
9. Disease or fungus: Give notice if detected. Do not apply fungicide or sealant unless instructed.

840 Crown reduction/ shaping

1. General: Cut back selectively to lateral or sublateral buds or branches to retain flowing branch lines without leaving stumps.
2. Operations: Seek approval

845 Crown lifting

1. Clearances: Remove branch systems to give clearance.

   1.1. Height: Min. 2.2m above circualtion routes unless instructed otherwise
2. Removing branches: Remove whole branches back to the stem, or cut lower portions of branches back to lateral or sublateral buds or branches. Do not leave stumps.

850 Crown thinning

1. Removing branches: Remove inward growing, crossing, rubbing, dead and damaged branches.
2. Thinning: Selectively remove secondary and small live branch growth evenly throughout the crown.
    2.1. Quantity: 15 %
3. Cutting: Make no cuts of more than 25 mm diameter.
    3.1. Branches: Cut back to lateral or sublateral buds or branches without leaving stumps.
4. Appearance: Leave a uniform and well balanced structure of branches and foliage.

855 Cutting tree roots

1. Excavating: Use hand tools only.
2. Protected area: Do not cut roots within an area which is the larger of:
    2.1. The branch spread of the tree.
    2.2. An area with a radius of half the tree's height, measured from the trunk.
3. Outside protected area: Give notice of roots exceeding 50 mm in diameter. Do not cut without approval.
4. Cutting
    4.1. Cutting: Make clean smooth cuts with a hand saw.
    4.2. Wounds: Minimize. Avoid ragged edges.
    4.3. Finishing: Pare cut surfaces smooth with a sharp knife.
5. Backfilling
    5.1. Protection: Cover cut roots with clean sharp sand.
    5.2. Material: Backfill with original topsoil.

860 Removing trees, shrubs and hedges

1. Standards: To BS 3998 and Health & Safety Executive (HSE)/ Arboricultural and Forestry Advisory Group Safety Leaflets.
2. Existing services: Check for below and above ground services. Give notice if they may be affected.
3. Shrubs and smaller trees: Cut down and grub up roots.
4. Tree stumps
    4.1. Treatment: Remove mechanically to a minimum depth of 300 mm below ground level
    4.2. Removal by winching: Give notice. Do not use other trees as supports or anchors.
5. Protection: Avoid damage to neighbouring trees, plants and property
6. Work near retained trees: Where tree canopies overlap and in confined spaces generally, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
7. Filling holes
    7.1. Material: Use as-dug material and/ or imported soil as required.
    7.2. Finishing: Consolidate and grade to marry in with surrounding ground level.

865 Bark damage

1. Wounds
    1.1. Do not attempt to stop sap bleeding.
    1.2. Bark: Remove ragged edges using a sharp knife.
    1.3. Wood: Remove splintered wood from deep wounds.
    1.4. Size: Keep wounds as small as possible.
2. Liquid or flux oozing from apparently healthy bark: Give notice.

870 Cavities in trees

1. Investigation: Remove rubbish and rotten wood. Probe the cavity to find the extent of any decay, and give notice.
2. Water filled cavities: Do not drain.
3. Sound wood inside cavities: Do not remove.
4. Cavity openings: Do not cover

Water areas - Not Used

Water areas, marginal & aquatic planting - Not Used

Hard landscape areas/fencing - Not Used

Hard landscape areas, street furniture, etc.

905 Hard landscape maintenance - general

1. All hard landscape & street furniture elements, e.g. paving, kerbs, drainage gullies/channels, seating, signage, play equipment, bins, bollards, etc. to be kept in a clean, weed-free, safe, sound and functional condition at all times.
2. Contractor to carry out regular inspections of all hard landscape & street furniture elements to check for defects and/or potential health & safety risks
    2.1. Contractor to advise: CA immediately of any defects and/or potential health & safety risks and provide remedial/protective measures as necessary to prevent risk of injury to users
    2.2. Submit proposals for approval

910 Hard surfaces and gravel areas

1. Herbicide: Apply a suitable foliar acting or residual herbicide. Allow recommended period for herbicide to take effect before clearing arisings.
2. Hard surfaces: Remove litter, leaves and other debris.
3. Surface gutters and channels: Remove mud, silt and debris.
4. Drainage gullies: Empty traps and flush clean.
5. Gravel areas: Rake over. Remove weeds, litter, leaves and debris, and level off.
6. Repairs to flexible bituminous pavings: In accordance with the original paving specification or BS 7370-2, clause 4.12.
7. Stain removal: In accordance with BS 7370-2, table 4.

920 Fencing

1. Fences: Inspect and repair to maintain protection against: Intruders. Note all fences and gates to be inspected at each visit and repaired as necessary to maintain safe boundary and access conditions for all users

925 Snow and/or ice clearance

1. Contractor to ensure that all hard landscape areas are kept in a safe and useable condition, free from ice and snow, in accordance with the following:
2. Snow Clearance: When instructed
3. Deicing: To roads and footpaths
    3.1. Material: Acetate based granules
    3.2. Timing: When instructed
    3.3. Application rate: Spread evenly at a rate of: As manufacturer's recommendations

930 Graffiti removal

1. Method: Submit proposals appropriate to the damaged surface material/finish
2. Subsequent treatment: Seek approval. Transparent, two part, anti-graffiti coating preferred subject to damaged surface material/finish
   2.1. Finish: Matt

945 Street furniture maintenance

1. Street furniture elements, e.g.: seating, bins, bollards, signage, etc., to be regularly maintained & inspected for defects and wear & tear, in accordance with manufacturer's requirements
2. Street furniture to be maintained in a clean, safe, sound & functioning condition at all times
3. Replacement parts to be sourced & installed in accordance with manufacturer's requirements
4. Contractor to advise: CAof any requirements for repairs, repainting, etc.
   4.1. submit proposals for approval
5. Contractor to ensure that any/all maintenance/repair operations do not in any way invalidate any warranties/guarantees

Green roofs & walls - additional requirements - Not Used

Ω End of Section

Q40
Fencing

Fencing systems

340 Steel vertical bar fencing

1. Manufacturer: Lang + Fulton Ltd or equal approved
   Technical & Sales, Newbridge Industrial Estate,
   Newbridge, Edinburgh, EH28 8PJ
   T: 0131 441 1255
   E: sales@langandfulton.co.uk
   1.1. Product reference: Description: Como-66
   66×132 mm pressure locked grating infill panels with RHS posts.
   Shop drawings to be submitted for Landscape Architect's approval prior to fabrication or ordering.
2. Standard: To BS 1722-14
3. Height: 2.2m tall
4. Verticals: TBC
5. Posts:
   5.1. Finish: Galvanised steel, zinc primed with powder coated
   5.1.1. Colour: Black, RAL 9005
6. Centres of posts (maximum): TBC
7. Accessories: 2No. Single Leaf soft close gated access to match. Note:
   - Min. 1.0m clear opening required for building maintenance access.
   - Security / locking system subject to confirmation with Client and building access control strategy.
8. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.

340B Steel vertical bar fencing

1. Manufacturer: Alpha Rail Ltd or equal approved
   Nunn Brook Rise,
   County Estate, Huthwaite,
   Nottinghamshire,
   NG17 2PD
   Tel: 01623 750 214
   Description: Flat infill bar fencing with horizontal top and bottom rail.
   Shop drawings to be submitted for Landscape Architect's approval prior to fabrication or ordering.
2. Standard: To BS 1722-14
3. Height: 1.8m tall
4. Verticals: TBC
5. Posts:
   5.1. Finish: Galvanised steel, zinc primed with powder coated
   5.1.1. Colour: Black, RAL 9005
6. Centres of posts (maximum): TBC
7. Accessories: Single Leaf soft close gate access to match. Note:
   - Min. 1.0m clear opening required for building maintenance access.
   - Security / locking system subject to confirmation with Client and building access control strategy.
8. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.

340C Steel vertical bar fencing

1. Manufacturer: Alpha Rail Ltd or equal approved
   Nunn Brook Rise,
   County Estate, Huthwaite,
   Nottinghamshire,
   NG17 2PD
   Tel: 01623 750 214
   Description: Flat infill bar fencing with horizontal top and bottom rail.
   Shop drawings to be submitted for Landscape Architect's approval prior to fabrication or ordering.
2. Standard: To BS 1722-14
3. Height: 1.1m tall
4. Verticals: TBC
5. Posts:
   5.1. Finish: Galvanised steel, zinc primed with powder coated
      5.1.1. Colour: Black, RAL 9005
6. Centres of posts (maximum): TBC
7. Accessories: double leaf soft close gated access to match. Note:
   - Min. 3.0m clear opening required for access.
   - Security / locking system subject to confirmation with Client.
8. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.
9. Notes: : Top line of gates to marry with top line of adjacent fence line. Baseplate fixed below coping with anchor bolts to supplier recommendations, fixed to low retaining wall. No visible fixings. Posts and panels to be demountable.

Gates, posts and stiles - Not Used

Accessories

635 Gate openers

1. Description: - MAIN ENTRANCE GATE
2. Manufacturer: Contractor to provide options for landscape architect approval.
3. Colour: To match ral colour of fence
4. Accessories: All gates to incorporate soft close mechanism with anti-finger trap design, in strict accordance with best practice and RoSPA guidance, including compliant ground clearance, gate stop and maximum swing.
   Top line of all gates to marry in with topline of adjacent fencing.

Execution

710 Installation generally

1. Set out and erect
   1.1. Alignment: Straight lines or smoothly flowing curves.
   1.2. Tops of posts: Following profile of the ground.
   1.3. Setting posts: Rigid, plumb and to specified depth, or greater where necessary to ensure adequate support.
   1.4. Fixings: All components securely fixed.

715 Competence

1. Operatives: Contractors must employ competent operatives.
2. Qualifications: Submit certification of training.

2.1. NHSS Sector Scheme 2A sub categories:

2.2. NHSS Sector Scheme 2C sub categories:

720 Setting posts in concrete

1. Standard: To BS 8500-2.
2. Mix: Designated concrete not less than GEN1 or Standard prescribed concrete not less than ST2.
3. Alternative mix for small quantities: 50 kg Portland cement to 150 kg fine aggregate to 250 kg 20 mm nominal maximum size coarse aggregate, medium workability.
4. Admixtures: Do not use.
5. Holes: Excavate neatly and with vertical sides.
6. Filling: Position post/ strut and fill hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
7. Backfilling of holes not completely filled with concrete: Excavated material, well rammed and consolidated.

730 Exposed concrete foundations

1. Filling: Compact until air bubbles cease to appear on the upper surface.
2. Finishing: Weathered to shed water and trowelled smooth.

740 Setting posts in earth

1. Holes: Excavated neatly, with vertical sides and as small as practicable to allow refilling.
2. Filling: Position posts/ struts and replace excavated material, well rammed as filling proceeds.

750 Driven posts

1. Damage to heads: Minimize.
   1.1. Repair: Neatly finish post tops after installation.

780 Making good galvanized surfaces

1. Treatment of minor damage (including on fasteners and fittings): Low melting point zinc alloy repair rods or powders made for this purpose, or at least two coats of zinc-rich paint to BS 4652.
2. Thickness: Apply sufficient material to provide a zinc coating at least equal in thickness to the original layer.

790 Site painting

1. Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

Completion

910 Cleaning

1. General: Leave the works in a clean, tidy condition.
2. Surfaces: Clean immediately before handover.

920 Fixings

1. All components: Tighten.
   1.1. Timing: Before handover.

930 Gates

1. Hinges, latches and closers: Adjust to provide smooth operation. Lubricate where necessary.

1.1. Timing: Before handover.

Ω End of Section

Q50
Site/street furniture/equipment

Clauses

2 To be read with preliminaries/ general conditions.

Gates, barriers and parking controls

190 Bollards

1. Description: Stainless Steel Bollard
2. Manufacturer: Marshalls Or similar Approved
   2.1. Product reference: RS001 Bollard dia 129 Root Fix. Anti-Ram
3. Material: Steel
   3.1. Finish as delivered: Hot-dip galvanized. Brushed satin. to BS EN ISO 1461
   3.2. Colour: Grey Aluminium as supplied
4. Height above ground: 1000 mm
5. Method of fixing: To manufacturers guidelines. suitable as anti-collision/building protection item. Root fixed, no visible fixings.

Site and street furniture

210A Cycle stands

1. Manufacturer: Proprietary Sheffield style stainless steel cycle stands. Broxap or equal approved.
   1.1. Finish: Stainless steel Satin Finish
   1.2. Colour: As supplied
      1.2.1. • Accessories: None.
      1.2.2. • Method of fixing: Baseplate bolted to 400x400mm concrete base, 100mm below surface finishes
      - in accordance with supplier recommendations. No visible fixings. .

220A Benches

1. Description: Kiwi Bench, with backrest and armrests. Refer to drawing: AGC377-GRA-2A-DR-L-1003
2. Manufacturer: Escofet, available from Marshalls Ltd or equal approved Tel. 03333 053504 Email: info@marshalls.co.uk.
   2.1. Finish: Powder coated finish.
   2.2. Colour: Silver
3. Size: 180cm length
4. Accessories/ Special requirements: None.
5. Method of fixing: In accordance with manufacturer's recommendations
6. End brackets for ground fixing, M10 x 16 bolt fixings.Note: Fixing detail to ensure no exposed footings. Refer also to Details. Localised concrete footing required to each seat location, to Engineer's details and specification.

220B Benches

1. Description: Cube seating. Refer to drawing: AGV-GRA-BZ-XX-DR-L-001003

2. Manufacturer: Bramhall1840 Ltd or equal approved Unit 5, Clarence Works Effingham Road Sheffield S4 7YS Tel. 0845 643 9882
   2.1. Material: FSC Certified Solid Hardwood timber cubes e.g. Seasoned Oak or equal approved.. Planed and sanded, free from burrs and splinters..
   2.2. Colour: Natural, as supplied
3. Size: 450mm wide x 450mm length x 550mm high.:
4. Method of fixing: Concealed fixings and footings.

350B Bird boxes

1. Manufacturer: Black Redstart nest box: e.g. Schwegler open fronted brick box 1HE (www.schwegler-nature.com) or equal approved.
   Location: Roof level, Plot B1, mounted to upstand element in north-facing position with maintenance access from roof level.
   Peregrine Ledge: e.g. Schwegler Peregrine Falcon nestbox (www.schwegler-nature.com)
   Location: Roof level, Plot B2 to outer edge of roof with maintenance access from roof level.
   1.1. Product reference: non- combustible range
2. Material: Stainless steel boxes, with integral finish to match Architectural façade finishes. Type and size to suit target species. Refer to Drawings for number and type. Orientation and height guidance to Ecologist's advice.
3. Method of fixing: To supplier's recommendations, and in accordance with the facade design requirements eg. mortared in place
4. Location : Starling and swift boxes to be incorporated into the facade details. Refer to Architectural elevations for locations.

350C Bat boxes

1. Manufacturer: The Bird Bat House Company
   1.1. Product reference: non- combustible range
2. Material: Stainless steel boxes, with integral finish to match Architectural façade finishes. Type and size to suit target species. Refer to Drawings for number and type. Orientation and height guidance to Ecologist's advice.
3. Method of fixing: To supplier's recommendations, and in accordance with the facade design requirements eg. mortared in place
4. Location : Bat boxes to be incorporated into the facade details. Refer to Architectural elevations for locations.

Timber structures

360 Bug Hotel

1. Manufacture : Contractor to suggest product for approval.

Installation

510 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: Designated, not less than GEN 1
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

530 Preservative treated timber

1. Surfaces exposed by minor cutting and drilling: Treated by immersion or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
2. Heavily worked sections: Re-treat.

540 Building in to masonry walls

1. Components being built in: Accurately positioned and securely supported. Set in mortar and pointed neatly to match adjacent walling.
2. Temporary support: Maintain for 48 hours (minimum) and prevent disturbance.

545 Erection of timber and prefabricated structures

1. Checking: 5 days (minimum) before proposed erection date, check foundations, holding down bolts, etc.
2. Inaccuracies or defects in prepared bases or supplied structures: Report immediately. Obtain instructions before proceeding.

550 Damage to galvanized surfaces

1. Minor damage in areas up to 40 mm² (including on fixings and fittings): Make good.
    1.1. Material: Low melting point zinc alloy repair rods or powders made for this purpose or at least two coats of zinc-rich paint to BS 4652.
    1.2. Thickness: Sufficient to provide a zinc coating at least equal to the original layer.

552 Damage to painted surfaces

1. In accordance with Section: **M60** of this Specification
2. Contractor to notify: CAof any damage to powder coated elements/finishes (e.g. street furniture, railings, etc.) immediately in order to agree a rectification/repair/replacement strategy
3. Any rectification/repair works, and/or replacements, are to be carried out by the Contractor at no additional cost to the Contract

555 Damage to powder coated surfaces

1. In accordance with Section: **Z31** of this Specification
2. Contractor to notify: CAof any damage to powder coated elements/finishes (e.g. street furniture, railings, etc.) immediately in order to agree a rectification/repair/replacement strategy
3. Any rectification/repair works, and/or replacements, are to be carried out by the Contractor at no additional cost to the Contract

560 Site painting

1. Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

Ω End of Section

Q52
Play and sports equipment

General - Not Used

System performance - Not Used

Products

320 Buddy Board See Saw

1. Standard: To BS EN 1176-1.
2. Manufacturer: Wicksteed Playscapes or equal approved Wicksteed Leisure Ltd Digby Street, Kettering Northamptonshire NN16 8YJ Tel: 01536 517028 Email: sales@wicksteed.co.uk
   2.1. Product reference: Buddy Board See Saw. 6060-089
3. Materials: High Density Polyethylene seat / Steel
4. Method of fixing: In strict accordance with supplier's details and recommendations..

320B Wicksteed Flyer

1. Standard: To BS EN 1176-1.
2. Manufacturer: Wicksteed Playscapes or equal approved Wicksteed Leisure Ltd Digby Street, Kettering Northamptonshire NN16 8YJ Tel: 01536 517028 Email: sales@wicksteed.co.uk
   2.1. Product reference: Wicksteed Flyer. 6070-179
3. Materials: High Density Polyethylene seat / Steel
4. Method of fixing: In strict accordance with supplier's details and recommendations..

320C Wicksteed Flyer Carriage

1. Standard: To BS EN 1176-1.
2. Manufacturer: Wicksteed Playscapes or equal approved Wicksteed Leisure Ltd Digby Street, Kettering Northamptonshire NN16 8YJ Tel: 01536 517028 Email: sales@wicksteed.co.uk
   2.1. Product reference: Wicksteed Flyer Carriage 6070-180-18
3. Materials: High Density Polyethylene seat / Steel
4. Method of fixing: In strict accordance with supplier's details and recommendations..

320D Rain Wheel

1. Standard: To BS EN 1176-1.
2. Manufacturer: Broxap Ltd. Rowhurst Industrial Estate Chesterton ST5 6BD
   2.1. Product reference: Rain Wheel/ Ref: BX/HMP 650004
3. Materials: High Density Polyethylene seat / Steel
4. Method of fixing: In strict accordance with supplier's details and recommendations..

320E : Messy Play Kitchen

1. Standard: To BS EN 1176-1.
2. Manufacturer: Broxap Ltd. Rowhurst Industrial Estate Chesterton ST5 6BD
   2.1. Product reference: Messy Play Kitchen. Ref BX/HMP 250041
3. Materials: High Density Polyethylene seat / Steel
4. Method of fixing: In strict accordance with supplier's details and recommendations..

Execution

710 Play equipment installation generally

1. Standard: To manufacturer's written instructions provided in accordance with BS EN 1176-1.

   NOTE:
2. NOTE TO ALL PLAY EQUIPMENT INSTALATION: Play equipment to be installed in strict accordance with supplier recommendations. Note that within the RPZ of existing trees, bespoke footing solutions may be required.

720 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: Designated, not less than GEN 1 or Standard prescribed, not less than ST2.
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

725 Setting components in concrete

1. Holes:
2. Components: Accurately positioned and securely supported.
3. Concrete fill: Fully compacted as filling proceeds.
4. Concrete foundations exposed to view: Finished to weathering profile to shed water and trowel smooth.
5. Temporary component support: Maintain undisturbed for minimum 48 hours.

Completion

910 Inspection

1. Standard: To BS EN 1176-1
2. Timing: 2 weeks prior to date when work is expected to be practically complete.
   Note: Independent RoSPA inspection of all play equipment, surfacing and access points to be carried out prior to handover. Results to be included in the O+M Manual.
3. Period of notice (minimum): 3 working days.

920 Cleaning

1. General: Leave the works in a clean, tidy condition.
2. Surfaces: Clean immediately before handover.

930 Testing

1. Standard: To BS EN 1176-1.

940 Labels

1. Standard:
2. Labels: Provide permanent labelling on all types of play equipment.
3. Location: Where visible when erected on site.

950 Documentation

1. Standard: : To BS EN 1176-1
2. Contents
   2.1. Copies of test reports.
   2.2. General product information.
   2.3. Installation information.
   2.4. Inspection and maintenance information.
3. Number of copies: 3
4. Submission: 2 weeks prior to date when work is expected to be practically complete

970 Operating tools

1. Tools: Supply tools required for operation, maintenance and cleaning purposes.

Ω End of Section

V91
Electrical systems - landscape

Clauses - Not Used

General

99A General

1. Refer to lighting engineer's drawings and specifiation for all external lighting requirements. refer to m+e engineer's drawings and specification for all other external power requirements.

System performance - Not Used

Products - Not Used

Execution - Not Used

Completion - Not Used

Ω End of Section

Z11
Purpose made metalwork

To be read with preliminaries/ general conditions.

54 Welding of steel

1. Method: Metal arc welding to BS EN 1011-1 and -2.

Products

310 Materials generally

1. Grades of metals, section dimensions and properties: To appropriate British Standards. When not specified, select grades and sections appropriate for the purpose.
2. Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.
3. Fasteners: To appropriate British Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish.

Products

310 Materials generally

1. Grades of metals, section dimensions and properties: To appropriate British Standards. When not specified, select grades and sections appropriate for the purpose.
2. Prefinished metal: May be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected
3. Fasteners: To appropriate British Standards and, unless specified otherwise, of same metal as component being fastened, with matching coating or finish

Fabrication

515 Fabrication generally

1. Contact between dissimilar metals in components: Avoid.
2. Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
   2.1. Moving parts: Free moving without binding.
3. Corner junctions of identical sections: Mitre.

520 Cold formed work

1. Profiles: Accurate, with straight arrises.

527 Welding

1. Description: -
2. Welding procedures:
   2.1. Method and standard: Metal arc welding to BS EN 1011-1 and -2.
   2.2. Welding Procedure Specification (WPS): Not required
3. Preparation:
   3.1. Joint preparation: Clean thoroughly.
   3.2. Surfaces of materials that will be self-finished and visible in the completed work: protect from weld splatter.
4. Jointing:

4.1. Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
4.2. Dissimilar metals: Welding not permitted
4.3. Strength requirements: Welds to achieve design loads.
4.4. Heat straightening: Submit proposals
4.5. Complex assemblies: Agree priority for welding members to minimize distortion caused by subsequent welds.
4.6. Tack welds: Use only for temporary attachment.
4.7. Jigs: Provide to support and restrain members during welding.
4.8. Filler plates: Submit proposals
4.9. Lap joints: Minimum 5 x metal thickness or 25 mm, whichever is greater.
4.10. Weld terminations: Clean and sound.

Fabrication

515 Fabrication generally

1. Contact between dissimilar metals in components: Avoid.
2. Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
   2.1. Moving parts: Free moving without binding.
3. Corner junctions of identical sections: Mitre.
4. Prefinished metals: Do not damage or alter appearance of finish.

520 Cold formed work

1. Profiles: Accurate, with straight arrises.

Finishing

710 Finishing welded and brazed joints visible in complete work

1. Standard: To BS EN ISO 8501-3.
   1.1. Preparation grade: P2
2. Butt joints: Smooth, and flush with adjacent surfaces.
3. Fillet joints: Neat.
4. Grinding: Grind smooth where indicated on drawings.

745 Preparation for application of coatings

1. General: Complete fabrication, and drill fixing holes before applying coatings.
2. Paint, grease, flux, rust, burrs and sharp arrises: Remove.

780 Galvanizing

1. Standard: To BS EN ISO 1461.
2. Preparation:
   2.1. Vent and drain holes: Provide in accordance with BS EN 14713-1 and -2. Seal after sections have been drained and cooled.
   2.2. Components subjected to cold working stresses: Heat treat to relieve stresses before galvanizing.
   2.3. Welding slag: Remove.
   2.4. Component cleaning: To BS EN ISO 8501-3.

2.5. Grade: St 2½

Finishing - Not Used

Ω End of Section

Z20
Fixings/adhesives

Clauses

2 To be read with preliminaries/ general conditions.

Products

310 Fasteners generally

1. Materials: To have:
   1.1. Bimetallic corrosion resistance appropriate to items being fixed.
   1.2. Atmospheric corrosion resistance appropriate to fixing location.
2. Appearance: Submit samples on request.

320 Packings

1. Materials: Noncompressible, corrosion proof.
2. Area of packings: Sufficient to transfer loads.

340 Masonry fixings

1. Light duty: Plugs and screws.
2. Heavy duty: Expansion anchors or chemical anchors.

350 Plugs

1. Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

390 Adhesives

1. Standards
   1.1. Hot-setting phenolic and aminoplastic: To BS 1203.
   1.2. Thermosetting wood adhesives: To BS EN 12765.
   1.3. Thermoplastic adhesives: To BS EN 204.

410 Powder actuated fixing systems

1. Types of fastener, accessories and consumables: As recommended by tool manufacturer.

Execution

610 Fixing generally

1. Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
2. Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers/ sleeves to avoid bimetallic corrosion.
3. Appearance: Fixings to be in straight lines at regular centres.

620 Fixing through finishes

1. Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

630 Fixing packings

1. Function: To take up tolerances and prevent distortion of materials and components.
2. Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
3. Locations: Not within zones to be filled with sealant.

640 Fixing cramps

1. Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centres.
2. Fasteners: Fix cramps to frames with screws of same material as cramps.
3. Fixings in masonry work: Fully bed in mortar.

670 Pelleted countersunk screw fixing

1. Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
2. Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
3. Finished level of pellets: Flush with surface.

680 Plugged countersunk screw fixing

1. Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
2. Plugs: Glue in to full depth of hole.
3. Finished level of plugs: Projecting above surface.

690 Using powder actuated fixing systems

1. Powder actuated fixing tools: To BS 4078-2 and Kitemark certified.
2. Operatives: Trained and certified as competent by tool manufacturer.

700 Applying adhesives

1. Surfaces: Clean. Adjust regularity and texture to suit bonding and gap filling characteristics of adhesive.
2. Support and clamping during setting: Provide as necessary. Do not mark surfaces of or distrort components being fixed.
3. Finished adhesive joints: Fully bonded. Free of surplus adhesive.

Ω End of Section

Z21
Mortars

To be read with preliminaries/ general conditions.

10 Mortar mixes

1. Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

Cement gauged mortars

110 Cement gauged mortar mixes

1. Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

120 Sand for site made cement gauged masonry mortars

1. Standard: To BS EN 13139.
2. Grading: 0/2 (FP or MP).
    2.1. Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5-6):
        2.1.1. Lower proportion of sand: Use category 3 fines.
        2.1.2. Higher proportion of sand: Use category 2 fines.
3. Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.

135 Site made lime:sand for cement gauged masonry mortars

1. Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
2. Lime: Nonhydraulic to BS EN 459-1.
    2.1. Type: CL 90S.
3. Mixing: Thoroughly mix lime with sand, in the dry state. Add water and mix again. Allow to stand, without drying out, for at least 16 hours before using.

160 Cements for mortars

1. Cement: To BS EN 197-1 and CE marked.
    1.1. Types: Portland cement, CEM I.
        1.1.1. Portland limestone cement, CEM II/A-L or CEM II/A-LL.
        1.1.2. Portland slag cement, CEM II/B-S.
        1.1.3. Portland fly ash cement, CEM II/B-V.
    1.2. Strength class: 32.5, 42.5 or 52.5.
2. White cement: To BS EN 197-1 and CE marked.
    2.1. Type: Portland cement, CEM I.
    2.2. Strength class: 52.5.
3. Sulfate resisting Portland cement:
    3.1. Types: To BS EN 197-1 Sulfate resisting Portland cement, CEM I/SR and CE marked.
        3.1.1. To BS EN 197-1 fly ash cement, CEM II/B-V and CE marked.
    3.2. Strength class: 32.5, 42.5 or 52.5.
4. Masonry cement: To BS EN 413-1 and CE marked.

4.1. Class: MC 12.5.

180 Admixtures for site made cement gauged mortars

1. Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
2. Other admixtures: Submit proposals.
3. Prohibited admixtures: Calcium chloride, ethylene glygol and any admixture containing calcium chloride.

210 Making cement gauged mortars

1. Batching: By volume. Use clean and accurate gauge boxes or buckets.
   1.1. Mix proportions: Based on dry sand. Allow for bulking of damp sand.
2. Mixing: Mix materials thoroughly to uniform consistency, free from lumps.
   2.1. Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.
3. Working time (maximum): Two hours at normal temperatures.
4. Contamination: Prevent intermixing with other materials.

Cement gauged mortars - Not Used

Lime:sand mortars - Not Used

Lime:sand mortars - Not Used

Ω End of Section

Z22
Sealants

Products

310 Joints

1. Description: Tbc
2. Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

Products - Not Used

Execution

610 Suitability of joints

1. Presealing checks:
   1.1. Joint dimensions: Within limits specified for the sealant.
   1.2. Substrate quality: Surfaces regular, undamaged and stable.
2. Joints not fit to receive sealant: Submit proposals for rectification

620 Preparing joints

1. Surfaces to which sealant must adhere:
   1.1. Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
   1.2. Clean using materials and methods recommended by sealant manufacturer.
2. Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
3. Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
4. Protection: Keep joints clean and protect from damage until sealant is applied.

630 Applying sealants

1. Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
2. Environmental conditions: Do not dry or raise temperature of joints by heating.
3. Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
4. Sealant profiles:
   4.1. Butt and lap joints: Slightly concave.
   4.2. Fillet joints: Flat or slightly convex.
5. Protection: Protect finished joints from contamination or damage until sealant has cured.

Execution

610 Suitability of joints

1. Presealing checks
   1.1. Joint dimensions: Within limits specified for the sealant.
   1.2. Substrate quality: Surfaces regular, undamaged and stable.
2. Joints not fit to receive sealant: Submit proposals for rectification.

620 Preparing joints

1. Surfaces to which sealant must adhere
   1.1. Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
   1.2. Clean using materials and methods recommended by sealant manufacturer.
2. Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
3. Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
4. Protection: Keep joints clean and protect from damage until sealant is applied.

630 Applying sealants

1. Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
2. Environmental conditions: Do not dry or raise temperature of joints by heating.
3. Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
4. Sealant profiles
   4.1. Butt and lap joints: Slightly concave.
   4.2. Fillet joints: Flat or slightly convex.
5. Protection: Protect finished joints from contamination or damage until sealant has cured.

Ω End of Section

Z31
Powder coatings

To be read with preliminaries/ general conditions.

120 Powder coating materials

1. Manufacturer: Obtain from one only of the following: Contractor's choice.
2. Selected manufacturer: Submit details before commencement of powder coating including:
   2.1. Name and contact details.
   2.2. Details of accreditation schemes.
   2.3. Technical data of product including current Agrément certificates.

205 Working procedures

1. Requirement: Comply with:
   1.1. Aluminium backgrounds: BS EN 12206-1:2004: *Paints and varnishes. Coating of aluminium and aluminium alloys for architectural purposes. Coatings prepared from coating powder*.
   1.2. Galvanized Steel backgrounds: BS EN 13438:2013: *Paints and varnishes. Powder organic coatings for hot dip galvanised or sherardised steel products for construction purposes*
   1.3. British Coatings Federation: *Code of safe practice - Application of thermosetting powder coatings by electrostatic spraying*
   1.4. Powder coating manufacturer’s guarantee
   1.5. Aluminium backgrounds: Qualicoat Standard

210 Working procedures

1. Comply with the follow following standards.
   1.1. Aluminium components: To BS 6496 or BS EN 12206-1.
   1.2. Steel components: To BS EN 13438.
   1.3. Safety standards: To British Coatings Federation 'Code of safe practice - Application of thermosetting powder coatings by electrostatic spraying'.

215 Powder coating applicators

1. Applicator requirements:
   1.1. Approved by powder coating manufacturer
   1.2. Currently certified to BS EN ISO 9001
   1.3. Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer
   1.4. Applicator to use only one plant
2. Aluminium backgrounds: Qualicoat Approved Applicator - Architectural powder coating to Qualicoat Standard from an approved supplier.
3. Selected applicator: Submit details before commencement of powder coating including:
   3.1. Name and contact details
   3.2. Details of accreditation schemes

220 Powder coating applicators

1. Applicator requirements
   1.1. Approved by powder coating manufacturer.
   1.2. Currently certified to BS EN ISO 9001.

1.3. Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.

1.4. Applicator to use only one plant.

1.5. Selected applicator: Submit details before commencement of powder coating including:

1.5.1. Name and contact details.

1.5.2. Details of accreditation schemes.

225 Guarantees

1. Powder coating manufacturer and applicator guarantees

1.1. Submit sample copies before commencement of powder coating.

1.2. Submit signed project specific copies on completion of work.

230 Control samples

1. Sequence: Prior to ordering materials for the works, obtain approval of appearance for:

1.1. Powder coated samples: Of various grades and forms of background metal to be used, showing any colour, texture and gloss variation.

1.2. Fabrication samples: Showing joint assembly, how powder coating is affected and how any cut metal edges are finished and protected.

2. Samples to include the following information

2.1. Product reference.

2.2. Colour.

2.3. Reference number.

2.4. Name.

2.5. Gloss level.

250 Component design

1. Condition of components to be powder coated

1.1. To comply with relevant recommendations of BS 4479-1, -3, and -4.

1.2. Of suitable size to fit plant capacity.

1.3. Of suitable thickness to withstand oven curing.

310 Pretreatment of aluminium components

1. Condition of components to be pretreated

1.1. Free from corrosion and damage.

1.2. All welding and jointing completed and finish off as specified.

1.3. Free from impurities including soil, grease, oil.

1.4. Suitable for and compatible with the pretreatment process.

2. Conversion coating requirements

2.1. Chromate system: To BS 6496 or BS EN 12206-1.

2.2. Chromate-free system: To BS EN 12206-1. Submit details before using.

3. Rinsing requirements: Use demineralized water. Drain and dry.

320 Pretreatment of steel components

1. Condition of components to be pretreated

1.1. Free from corrosion and damage.

1.2. All welding and jointing completed and finish off as specified.

1.3. Free from impurities including soil, grease, oil.

1.4. Suitable for and compatible with the pretreatment process.

2. Conversion coating requirements: To BS EN 13438.
3. Rinsing requirements: Use demineralized water. Drain and dry.

430 Extent of powder coatings

1. Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 6496 or BS EN 13438 performance requirements.

435 Application of powder coatings

1. Surfaces to receive powder coatings: Free from dust or powder deposits.
2. Powder colours: Obtain from one batch of one manufacturer.
3. Commencement of powder coating: To be continuous from pretreatment.
4. Jig points: Not visible on coated components.
5. Curing: Controlled to attain metal temperatures and hold periods recommended by powder coating manufacturer.
6. Stripping and recoating of components: Only acceptable by prior agreement of powder coating manufacturer. Stripping, pretreatment and powder coating are to be in accordance with manufacturer's requirements.
7. Overcoating of components: Not acceptable.

440 Performance and appearance of powder coatings

1. For aluminium components

1.1. Standard: To BS 6496 or BS EN 12206-1.

2. For steel components

2.1. Standard: To BS EN 13438.

3. Visual inspection after powder coating: Significant surface viewing distances to be as specified in the relevant Standard, unless specified otherwise.
4. Colour and gloss levels: To conform with approved samples.

450 Aluminium alloy fabrications

1. Units may be assembled

1.1. Before powder coating.

1.2. From components powder coated after cutting to size.

1.3. Where approved, from components powder coated before cutting to size.

2. Exposure of uncoated background metal: Not acceptable.
3. Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

460 Steel fabrications

1. Unit assembly: Wherever practical, before powder coating.
2. Exposure of uncoated background metal: Not acceptable.
3. Assembly sealants: Compatible with powder coatings. Obtain approval of colour if sealants are visible after fabrication.

470 Fixings

1. Exposed metal fixings: Powder coat together with components, or coat with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.

480 Damaged components – repair or replacement

1. Before delivery to site: Check all components for damage to powder coatings. Replace damaged components.
2. Site damage: Submit proposals for repair or replacement.

510 Protection

1. Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.
2. Protective coverings: Must be:
   2.1. Resistant to weather conditions.
   2.2. Partially removable to suit building in and access to fixing points.
3. Protective tapes in contact with powder coatings: Must be:
   3.1. Low tack, self adhesive and light in colour.
   3.2. Applied and removed in accordance with tape and powder coating manufacturers' recommendations. Do not use solvents to remove residues as these are detrimental to the coating.
4. Inspection of protection: Carry out monthly. Promptly repair any deterioration or deficiency.

535 Documentation

1. Submit the following information for each batch of powder coated components
   1.1. Supplier.
   1.2. Trade name.
   1.3. Colour.
   1.4. Type of powder.
   1.5. Method of application.
   1.6. Batch and reference number.
   1.7. Statutory requirements.
   1.8. Test certificates.
   1.9. Maintenance instructions.

540 Completion

1. Protection: Remove.
2. Cleaning and maintenance of powder coatings: Carry out in accordance with procedures detailed in powder coating manufacturer and applicator guarantees.

Ω End of Section

Specification created using NBS Chorus

APPENDICES

Appendices references for Landscape Specification AGC377-GRA-2A-SP-L-9003:

Appendix 01 - Drawing List
Appendix 02 - Plant Schedules
Appendix 03 – Horticultural Trade Association CPSE
Appendix 04 - Urban Tree Soil
Appendix 05 – Bauder Living Roofs
Appendix 06 – Charcon Concrete Block
Appendix 07 – Breedon Gravel
Appendix 08 – Jakob Inox wall mounted trellis
Appendix 09 – Tobermore Step Units
Appendix 10 – Safety Surface
Appendix 11 – Green Blue Urban Tree Pit

Appendix 01: Drawing List

grant associates
Landscape Architecture
Urban Design
Ecology

22 Milk Street, Bath BA1 1UT
Telephone (+44)1225 332664
Email info@grant-associates.uk.com

AGAR GROVE REGENERATION
PHASE 2A
DRAWING LIST

DWG NO./REPORT	DESCRIPTION	SCALE	SIZE
PLANS			
AGC377-GRA-2A-DR-L-1001	Site Wide Masterplan	1:500	A1
AGC377-GRA-2A-DR-L-1003	Phase 2A General Arrangement	1:200	A1
AGC377-GRA-2A-DR-L-2001	Finished Levels Strategy	1:200	A1
AGC377-GRA-2A-DR-L-3001	Hard Landscape General Arrangement	1:200	A1
AGC377-GRA-2A-DR-L-4001	Soiling General Arrangement	1:200	A1
AGC377-GRA-2A-DR-L-5001	Soft Landscape General Arrangement	1:200	A1
AGC377-GRA-2A-DR-L-9001	Legend	NTS	A1
SECTIONS/ELEVATIONS			
AGC377-GRA-2A-DR-L-1301	Section AA	1:50	A1
AGC377-GRA-2A-DR-L-1302	Section BB	1:50	A1
AGC377-GRA-2A-DR-L-1303	Section CC	1:50	A1
AGC377-GRA-2A-DR-L-1304	Section DD	1:50	A1
AGC377-GRA-2A-DR-L-1305	Section GG	1:50	A1
AGC377-GRA-2A-DR-L-1306	Sections HH & II	1:50	A1
AGC377-GRA-2A-DR-L-1307	Sections JJ	1:50	A1
AGC377-GRA-2A-DR-L-1308	Sections KK	1:50	A1
DETAILS			
AGC377-GRA-2A-DR-L-3501	Typical Boundary Details	1:10	A1
AGC377-GRA-2A-DR-L-3502	TypicalHandrail Details	1:10	A1
AGC377-GRA-2A-DR-L-5501	Typical Tree Pit Details	1:20	A1
AGC377-GRA-2A-DR-L-5502	Typical Tree Pit Details	1:20	A1
AGC377-GRA-2A-DR-L-5503	Typical Planting Details	1:10	A1
AGC377-GRA-2A-DR-L-5504	Typical Planting Details	1:10	A1
LANDSCAPE REPORTS			
AGC377-GRA-2A-SP-L-9003	Hard & Soft Landscape Specification	NA	A4
AGC377-GRA-2A-SH-L-9001	Planting Schedules	NA	A4

update drawing references (reattach drawing issue sheet)

Appendix 02: Plant Schedules

REFER TO DOCUMENT AGV-GRA-BZ-XX-SH-L-009001

Appendix 03: Horticultural Trade Association (CPSE)

HANDLING AND ESTABLISHING LANDSCAPE PLANTS

Published by
The Committee for Plant Supply
and Establishment

Revised edition - November 1995

INTRODUCTION

Most of the amenity tree and shrub species used in the United Kingdom can be reliably and easily transplanted, provided:-

the planting soil is properly prepared, drained and will support the chosen plants
the plants are healthy and have been carefully lifted, stored and transported as relatively fragile living organisms

the planting is done correctly and in the right season

the planting is followed by proper after care.

For large scale planting the ideal conditions are difficult to achieve and there are often large numbers of plant failures or very little growth for the first few years after planting. This code of practice shows how this can be avoided and recommends the essential minimum standards that are required to achieve satisfactory planting and establishment. For the most part they are based on the accumulated experiences of the horticultural and landscaping industry and supplemented by an increasing body of scientific and systematic research, all of which support the following general principles.

1. Hardy nursery stock plants, even when they are dormant, are living organisms and although they have a certain "shelf life" they will quickly die if they are not properly stored or handled. There is evidence that after bad commercial practice some plants may be incapable of surviving even before thev are planted.

2. Small stock, seedlings and transplants will generally transplant and establish better than standard trees and other large stock. However, they obviously have much less early impact in a landscaping scheme and they are rather more susceptible to root drying and failure if they are not handled correctly, and to damage by weeds and rabbits.

3 Root drying is the most common source of plant failure and lethal drying can take place very quickly if lifted plants are left unwrapped. Root dips may provide some protection against drying but are not a substitute for, or provide any significant advantage over proper handling and root protection.

4 Black polythene bags are an essential aid for keeping bare roots moist. However, in sunlight they will rapidly absorb heat and thus warm up any plant material inside to potentially lethal temperatures. Co-extruded black and white polythene bags, though more expensive, do not suffer from this fault and are strongly recommended as the best practical protection for lifted bare root plants where shaded storage is not available.

5. Small stock in particular is sensitive to rough handling and the physical shock of repeated dropping or crushing will significantly reduce the survival rate.

6. Cell grown stock, usually small seedlings, are much more able to survive poor storage and handling but do not necessarily show any distinct advantage over well handled bare root seedlings.

7. Container grown plants are a much more reliable form of planting stock and can be successfully planted at almost any time of the year, if adequate watering is available. They are, however, considerably more expensive to grow and transport.

8. At all stages between lifting and establishment, plants are susceptible to rodent damage and protective measures should be taken.

9. Even the best quality and carefully handled stock will not flourish in waterlogged or infertile soils (apart from willows and a few other species). Adequate drainage and soil preparation are therefore just as important as plant handling.

10. Finally, professional after care is essential if the plants are to survive and establish beyond the planting stage. In particular it is important to ensure that appropriate watering is available in dry spells and the competition for soil moisture is reduced by rigorous weed control.

In attempting to give concise guidance a number of aspects of good management practice have only been touched on or have been omitted. Fuller details for specific sectors of the landscape and forestry planting industry can be found in the publications that are listed on page 19. Similarly, the formal requirements of contract arrangements are not covered in the booklet as in many planting schemes the number of parties and the links between them can be complex. However, it is essential that the contractual responsibilities are clearly defined if cost effective results are to be obtained.

Finally, although this booklet is mainly directed towards hardwood trees and shrubs, similar recommendations also apply to herbaceous species.

November 1995

CONTENTS

PART I
RECOMMENDATIONS FOR PLANT HANDLLNG - FROM LIFTING UNTIL DISPATCH

1.0 INTRODUCTION

1.1 Objective

Once out of the ground, plants and especially plant roots are highly susceptible to damage. Adherence to these recommendations should ensure that plant roots are exposed to the risk of damage for the minimum time, so that following re-planting there will be maximum plant survival. Container grown plants, although less prone to root drying, need to be protected from extremes of cold and physical damage to the shoots. Nursery operations should be earned out by appropriately skilled operatives under the control of competent management and with adequate supervision.

1.2 Scope

These recommendations apply to the handling of trees, shrubs, climbers, roses, conifers, forestry planting stock, hedging plants, fruit trees and bushes.

Similar recommendations also apply to herbaceous perennials, alpines. etc. but the primary concern of this booklet is for hardwood species.

1.3 Damage

Damage to plants and plant roots can be caused after lifting hy:-

drying-out (even in still, apparently moist air)
heating up
freezing
water-logging
physical breakage.

Plant viability can also be reduced by crushing, dropping etc. even if no visible physical breakage results. Plants must therefore be handled gently and with care at all times.

1.4 Length of Time at Risk

Ensure the period between lifting and placing plants under temporary storage, and the periods between such storage and dispatching from the nursery are kept to a minimum.

Unless in cold storage, ensure the plants are in temporary storage for the minimum of time appropriate to the method of temporary storage and time of year.

Dispatch hare-root plants in sufficient time to allow the purchaser to plant dormant stock. (This usually means dispatch by mid March unless otherwise agreed with the purchaser).

2.0 TIME OF LIFTING

2.1 Bare-root and Root-balled Plants

Lift deciduous plants when the ground is moist and the plants are dormant - normally between mid October and March. (Earlier or later lifting may he possible where local conditions or seasons permit but. where possible, lifting should be delayed until the leaves have been shed and the plants are fully dormant).

Lift evergreen species between September and April provided the ground is moist. (Note:- evergreen plants, other than forestry transplants, should be root balled or container grown).

For all species avoid lifting during severe ground frost or when the ground is frozen. Pay particular attention to protecting roots when lifting in a drying *wind* or in sun.

Ensure root balls are adequately supported to prevent the soil falling off the root.

2.2 Container and Cell-grown Plants

Move at any season, except during periods of extreme cold, provided the root systems are well established in the containers and the plants are fully hardened off.

3.0 BUNDLING AND BAGGING

3.1 All bare roots should be put into plastic bags or given equivalent protection immediately after lifting.

So as to minimise the risk of heating up, only bundle when foliage surface is dry, and consider the type and condition of the plants when deciding the number per bundle, or how many to put into a bag.

Do not bundle container-grown or root-balled plants.

3.2 Securely tie in the lateral branches of feathered trees and other stock if they may be damaged during transit

4. TRANSPORTING PLANTS WITHIN THE NURSERY

4.1 Be as speedy as possible in getting plants into temporary storage, as they are at particular risk during this transportation period.

4.2 Minimise moisture loss at all times; always protect bare roots. On open vehicles securely sheet over roots in such a way that there is the minimum draught under the sheet.

4.3 Root-hailed and container-grown plants may be transported within the nursery without additional protection, provided the plants are not exposed to extremes of temperature.

5. SHORT TERM STORAGE BEFORE DISPATCH

Plants may be stored for the minimum of time appropriate to the method of temporary storage and packaging, provided the following requirements are strictly adhered to:

5.1 Bare root Plants

5.1.1 Outside

Keep the plants in a sheltered and preferably shaded location. Surround the roots with a freely-draining moisture-retentive material moistened periodically as the condition of the material requires. Ensure good contact between the material and the roots.

5.1.2 Indoors

Relatively short periods of exposure outside of plastic bags, even in an unheated packing shed, can result in serious drying out, especially of roots, and thus plant losses. For unprotected plants kept in such a location for up to 24 hours, lightly spray the roots at regular intervals to keep them moist. For longer periods, surround the roots with a freely-draining, moisture-retentive material and moisten as frequently as the conditions require. Ensure good contact between the material and the roots.

5.1.3 In Polythene Bags

Protect the bags from direct sunlight at all times unless the plants are in black and white co-extruded polythene bags. Do not stack bags for any length of time. Where delays of more than a few days occur, store the bags upright in a shady position or shed, or place them in a cold store. Regularly examine the stock for signs of fungal disease and, if necessary, open up the bags and keep them upright in a cool ventilated position.

5.1.4 In Cold Storage

In direct cold stores enclose the plants entirely in polythene. In jacket or humidified cold stores, no special protection is necessary, provided the humidity is maintained at a high level.

5.2 Root-balled Plants

For short periods of storage, keep permeable wrappings moist by watering. For longer periods of storage, any polythene wrappings should be well perforated and protected from direct sunlight. Place plants with root-balls with permeable wrappings on a well-drained surface and cover with a freely-draining, moisture-retentive material, moistened as regularly as the condition of the material requires. Ensure good contact between the material and the root-ball.

5.3 Container-grown Plants

Stand containers upright on well drained, weed-free ground. Whatever the time of year. water sufficiently to prevent the compost drying out. Support tall plants to prevent them blowing over. During the winter months give temporary frost protection to susceptible species and plants recently grown under cover.

6.0 LOADING FOR DISPATCH

Unless otherwise instructed by the purchaser, adhere to the specification for packaging and transporting nursery' stock which forms Part II of this booklet.

PART II

SPECIFICATION FOR PACKAGING AND TRANSPORTING NURSERY STOCK

1.0 INTRODUCTION

1.1 Good handling and packaging between the nursery bed and final planting are essential if damage to plants is to be minimised. This Specification should be incorporated as an integral part of any invitation to tender for and contract to supply trees and shrubs.

1.2 With high unit value plants the purchaser may wish to specify additional packaging - but this may increase the cost of the plants. (See para 4.7 below).

1.3 Throughout this document the use of black plastic bags is specified as the basic minimum requirement for the packaging of bare roots. However, as an alternative, it is recommended that the purchaser should specify the use of co-extruded black and white plastic bags as the best practical means of protecting against drying out and heating up in sunlight. This is particularly important for late season planting, say from early March onwards.

1.4 On receipt of a delivery, the purchaser should check that each requirement of this specification has been complied with by the supplier.

2.0 BUNDLING

2.1 General

Bundles of bare rooted plants shall consist of graded plants of one species with all shoots facing the same direction. Quantities of any item shall be bundled into equal numbers of plants; any remaining part-bundle shall be clearly marked. A bundle shall be of such a size that one person can handle it on receipt, unless the supplier has ascertained, in advance and in writing from the purchaser, that mechanical handling will be available at the place and time of delivery'. Bundles shall be tied securely with string, twine, plastic strip or other supple material which will not, by its nature or tension, cause damage to the plants, or each bundle may be enclosed in a securely tied bag

2.2 Bare-root Trees

Do not exceed the following quantities in each bundle. The quantity shall be reduced where larger heads or roots may be subject to damage.

a Seedlings & Transplants

up to 20cm high	100 per bundle
20 - 60cm high	75 per bundle
60 - 100cm high	50 per bundle

b. Whips & Feathered Trees

1 - 1.5m high	25 per bundle
1.5 - 1.75m high	15 per bundle
1.75 - 2.5m high	5 per bundle

c. Standard Trees

4 - 8cm girth	5 per bundle
8 - 10cm girth	3 per bundle
10 - 12cm girth	2 per bundle
12cm plus girth	not bundled

2.3 Root-balled and Container Grown Plants

These plants shall not be bundled but may be. packed in crates or packages to ease handling and prevent damage or deterioration in transit.

2.4 Cell-grown Plants (i.e. plants grown in a variety' of ways with a cylinder or block of rooting material attached)

These can be packed in a variety of trays or flatpacks; normally with a maximum of 50 plants in each pack.

3.0 LABELLING

3.1 General

Each individual or plant bundle, bag or lot of one species of plants shall be labelled by the supplier with a securely attached and durable primary label. The PLANT NAME, SIZE and QUANTITY in the bundle or bag, and the TOTAL QUANTITY in the consignment shall be clearly and durably displayed on every label, and if requested, together with the SUPPLIER'S NAME. A reasonable proportion of a large consignment of distinct plants shall bear a durably written secondary label easily related to the primary label.

3.2 EU Regulations *&* Plant Health Regulations

Species requiring plant passports that are the subject of the Plant Health (Great Britain) Order 1993 and forestry species specified under the EU Forest Reproductive Materials Regulations (1977) shall be documented in accordance with those Regulations.

4.0 PACKAGING

4.1 Bare root Plants up to 60cm tall

Bare-root plants up to 60cm tall shall be entirely enclosed in black plastic bags (150 gauge minimum) securely tied at the top. Plants shall be loosely bundled within the bag, which shall be of an adequate size. All shoots must face in the same direction so that roots and shoots are not in contact. Thorny or very bushy plants may he dealt with as in 4.2 below.

4.2 Bare-root Plants 60cm tall and above up to standard trees with 14cm girth

If total enclosure is not practicable as in 41 above, the roots of bundles of plants shall be enclosed in a black plastic bag which shall be securely tied around the stems.

4.3 Bare-root Trees 14 - 18cm girth

To be supplied mainly free from soil adhering to the roots unless otherwise specified, but with the roots packed with a pre-wetted moisture - retentive granular or fibrous material, enclosed in either black polythene bags, or in a porous material such as hessian, and firmly secured.

4.4 Root-balled Plants

Trees over 14cm girth, and certain other trees and shrubs which by their nature require balling at smaller sizes, shall be root wrapped or rootballed (See BS 3936 part 1 1992 and National Plant Specification).
Root balls shall be kept moist, supported by twine or stronger material where the root ball so requires to prevent collapse, and kept moist by wrapping firmly with moisture-retentive porous material such as sacking.
Packing shall be firmly secured over the top of the root ball. Where wire netting is used to support the ball, any moisture-retentive material such as sacking shall be wrapped inside the wire netting. (See Part III 6.4.)

4.5 Container and Cell-Grown Plants

Container grown plants will not normally receive additional packaging, but degradable pots or cells that arc likely to disintegrate in transit shall be enclosed in polythene film (250 guage) and firmly secured. They should never he stacked or put together in a way likely to damage one another, e.g. through weight or overheating.

4.7 Variations in Packaging

Variations from the above packaging may be appropriate in certain circumstances. The purchaser shall state such revised specification in the tender conditions for the purchase and supply of plants, or the requirements shall be otherwise agreed in writing between the purchaser and supplier prior to submission of tenders.

For example, exceptionally, and only if agreed by the purchaser, plants may be supplied bare-root, without root wrapping, for bulk deliveries. If so the roots shall be kept moist at all times preferably by packing with suitable moisture retentive material. The plants must also be protected from draughts and be sheeted over in transit. Alternatively, pallets or bins sealed with polythene and shrink wrapped are suitable for bulk deliver}' of bare root transplants.

5.0 TRANSPORT

5.1 Open Lorries

All plants shall be loaded, stacked and unloaded in such a way that breakage or crushing by the weight of plants above, or the security ropes, will not occur. The consignment shall be completely and firmly covered with opaque sheeting in such a way that there is the minimum draught under the sheet from the direction of travel.

5.2 Closed Lorries or Containers

All plant material shall be loaded in such a way that breakage or crushing by the weight of plants above is avoided during loading, transit and unloading. Provision shall also be made to ensure that the load remains cool and moist at all times.

5.3 Transit by Third Parties (e.g. Post, rail, road, etc.)

Where transport is entrusted to others, not under the control of the supplier or the purchaser, the sender must ensure that the packaging is adequate to protect the plants whilst in the third party's charge.
Consignments shall be clearly addressed, manageable units, securely crated or packaged to withstand mechanical damage. The packaging must also include sufficient moisture retentive material around the roots to ensure that they remain cool and moist until they are delivered to the purchaser.

PART HI
RECOMMENDATIONS FOR PLANT HANDLING
- FROM DELIVERY TO SITE TO
SUCCESSFUL ESTABLISHMENT

1.0 INTRODUCTION

1.1 Plants are living things, even when dormant and transplanting and establishment involves them in considerable stress. If the process is to be successful it must be planned, managed and supervised to satisfy the basic biological requirements of the plants. To achieve this, the planting must be followed by a period of planned aftercare, covering at least two growing seasons.
These recommendations set out the requirements that should be followed and specified in detail according to the situation on each particular site. They assume that the nurseryman supplying the stock has adhered to the "Recommendations for Plant Handling from lifting until Dispatch" and the purchaser has specified, and the nurseryman has adhered to, the "Specification for Packaging and Transporting Nursery Stock". It is also assumed that the species and plant specification (age, size, etc) are correctly chosen for the geographical location and site conditions.

1.2 External Pressures

Even when the work is properly specified, there are many outside pressures that provide strong incentives to set aside or compromise the biological and other principles and factors. These include:-

The relatively short lifting and planting season for open grown plants.

The logistics of lifting and supplying large numbers of different species.
The financial pressure to complete projects as a whole, or within a financial year or complete deliveries in time for early payment.
The unpredictable and often unsuitable weather conditions which may reduce the effective planting season.

Engineering and building contractors not making the site available on time.

1.3 Management Measures

In order to counter these pressures, it is essential that:-

1. The planting specifications are prepared in detail to suit the requirements of the site.

2. The planting is planned, as far as possible in advance of the planting season and plants are ordered, in the normally available sizes. (For guidance see National Plant Specification).
3. The planting area is adequately prepared when soil conditions are suitable, preferably in advance of the actual planting.
4. Arrangements are made for close liaison with the nurseryman during the planting season so that the supply of plants can be co-ordinated with the planting on site.
5. Adequate facilities are available for the receipt and storage of plants, including a conveniently situated water supply.
6. The receipt and care of the plants and the planting is only carried out by appropriately skilled operatives under the control of competent management and with adequate supervision.
7. After care is properly specified in advance and the finance secured as part of the overall planting and establishment cost.

2.0 PI ANTING SEASON

2.1 Bare Root or Root-balled Plants

The natural planting season is during the dormant period which is normally from mid October to the end of March, but early planting, before the end of the year, is generally more successful than planting from January onwards. Late plantings are particularly vulnerable to Spring droughts and should be avoided unless watering can be carried out, or planting can be done with cold stored plants. Evergreens establish more readily if planted in early Autumn or late Spring; providing water can be applied in dry' spells of weather.

In exceptional circumstances, where there is serious risk of frost lift, autumn planting is not recommended. In such circumstances it is preferable to plant as soon as the soil becomes workable in the spring.

2.2 Container-grown Plants

These may he planted throughout the year m appropriate weather conditions provided they are regularly watered.

3.0 RECEIPT AND UNLOADING

3.1 When placing an order, the purchaser shall give the nurseryman notice of any restrictions of access to the delivery site, and notify him whether mechanical lifting aids are available for off-loading.

3.2 The nurseryman shall give adequate notice of the date and time of delivery within the agreed programme, and the purchaser shall ensure that adequate numbers of staff with mechanical lifting aids, where previously notified, are available to assist the off-loading without delay.

3.3 During unloading damage in handling shall be avoided.

3.4 The purchaser shall inspect and check the plants as quickly as possible after unloading to ensure each requirement has been complied with by the supplier Whenever possible the deliveries should be planned so that the plants can be planted as soon as possible. If this is not possible the plants shall be moved in to temporary storage.

4.0 TEMPORARY STORAGE ON SITE

4.1 Short Term

Where the daytime air temperature is under 1()"C plants may be stored in their packaging, under cover and away from sunlight, for a maximum of 7 days after receipt from the nurseryman but this may be extended to 14 days if temperatures are under 5"C. During this time the roots must be kept moist.

4.2 Longer Storage

4.2.1 Bare Root Plants and Root-Wrapped Plants

Bare root plants and plants root-wrapped in porous material should be heeled-in or plunged into moisture retentive material Any non-porous root wrappings shall be removed before heeling in.

The roots of all plants shall be moist and placed so that all are in contact with the plunge medium. In order to achieve this, a free moving medium is required, such as a 50/50 mixture of coarse sand and peat, or sawdust, and care must be taken to ensure no degradation or heating up of the material occurs. Bundles of plants will require cutting open and spreading out so that intimate contact between the roots and the plunging medium is achieved. The plunging site shall be well drained and sheltered, and stout rails will be needed to support standard trees and other large stock. An adequate supply of water points is essential and the plunge medium must be kept moist at all times.

If necessary, plants may remain heeled-in from November to mid March, but the period shall be kept as short as possible. Beyond this period, plants required for late plantings shall be kept in cold store. Any other plants shall be planted out in nursery beds for a further season or containerised prior to the start of new growth.

4.2.2 Root-balled Plants in Porous Material

Root-balled plants in a porous material shall be supported upright with the ball immersed in a deep layer of moist straw, hay, sand, peat, pulverised bark, sawdust, suitable soil or other suitable material. Watering may be essential to prevent the ball drying out.

4.2.3 Container-grown Plants

Containers shall be stood upright on well-drained, weed-free ground. Sufficient watering will he required for container grown stock at any time of the year to prevent the compost drying out. Tall plants will require support to prevent them blowing over. Species susceptible to frost damage shall be given temporary protection, (see also Part I para 5.3).

4.3 Removal from Temporary Storage

Container *grown stock and root-balled plants shall be well watered before transportation to the planting site.* The roots of bare-root stock shall be moist before removal from the heelmg-m or plunge medium and the roots shall be placed directly into black polythene bags to prevent drying-out and kept in them until immediately before planting. Consignments supplied in bulk shall be split up and wrapped in black polythene bags to minimise the length of time plants are exposed to drying during the planting process. (The use of co-extruded black and white polythene bags is recommended. See Part 11 1.3). Plants shall be re-labelled as necessary.

5.0 GROUND PREPARATION

5.1 The planting site shall:-

5.1.1 Be naturally or physically drained, or raised by mounding so that the plants will not be subjected to waterlogging at any time.

5.1.2 Have a soil texture and structure that will retain and release moisture and nutrients to the plant and a crumb structure that will promote root growth to at least 3 times the width and 1.5 times the depth of the roots of the plants to be planted.

5.2 Preparation of the Planting Site

The following are essential points that should be considered and specified as necessary if these properties are to be achieved:-

5.2.1 Any ground preparation is best carried out in advance of the planting season, when the weather is more reliable and less soil structure damage is likely to be caused. This will allow more time for the planting operations but it is essential to ensure that the soil is protected from construction traffic or other compaction or pollution.

5.2.2 Extremely heavy and poorly structured soils may need to be improved by the thorough incorporation of suitable organic matter and special drainage arrangements. Extremely light soils may also need added organic matter to improve their water holding capacity and avoid the need for frequent irrigation. (Peat based composts or similar are not suitable for these purposes).

5.2.3 Where planting is proposed on imported soil or made up ground or where the soil structure has been impaired, a good soil structure needs to be established before planting takes place. This may involve deep soil cultivation and draining, followed bv grassing or herbaceous cover, and the delay of planting for at least one growing season.

5.3 If ground preparation as specified in 5.2 is necessary it shall be earned out over an area at least 3 times the diameter of the root spread, and 1.5 times the depth of the roots, of the plants to be planted.

6.0 PLANTING

6.1 Soil Conditions for Planting

At the time of planting, the soil shall be moist and friable and not frozen, excessively dry, or water-logged.

6.2 Planting Requirements

The excavated hole shall be of sufficient size to accommodate the spread roots and the stock shall be planted so that after any settlement it is at the same depth as it was grown in the nursery. If the sides of the planting hole becomes smeared during digging, particularly on heavy clay soils, the smearing shall be broken up before planting.

6.3 Stabilising Support and Protection

Most plants above 1m high will need a support to hold them secure at ground level either by stakes or by cables for very large stock. Stakes or stout canes as specified, shall be inserted before planting. Plants shall be held secure against the stake by the use of a proprietary tie, or similar method, ensuring that the stem shall not chafe against the stake and there is space for stem expansion. Short stakes to hold the base of the stem are preferable but individual guards or shelters may be needed to protect trees against physical damage by vandals, cattle, rabbits, mowers or strimmers. Alternatively, the plantation may be protected by suitable fencing. See also 7.5.

6.4 Treatment of Plants immediately Prior to Planting

Bare root plants shall be kept in polythene bags until immediately before planting. They shall be kept out of direct sunlight unless co-extruded bags are used. Similarly all containers and wrapping, unless fully bio-degradable, shall be removed at the latest point before planting.

Root-balled plants and plants in root control bags shall be placed in the planting pit before the hessian or other protective material is removed to avoid disturbance of the root-ball. Wire netting shall be left on the root ball provided that there is only biodegradable porous material between the wire netting and the root-ball. Root control bags should be removed.

Damaged or torn roots and stems shall be cut back cleanly with a knife or secateurs and, *particularly with container-grwon plant,. any coiled roofs shall be spread out or cut to prevent future stability problems.*

6.5 Back-filling

During backfillmg around the plant, the soil shall be lightly firmed to ensure intimate contact with the roots, but with large material, successive layers of soil will need to be firmed as backfilling proceeds. The layers of soil shall be firmed separately so that the plant is securely held but penetration of moisture is not restricted. Snow must not be allowed to become mixed with the backfill material. Plastic perforated pipe for irrigation should be installed as part of the back filling, where specified, (see 7.4 below).

6.6 Pruning

After planting, any damaged, dead, diseased or crossing branches shall be removed by pruning.
Opinions differ on whether the size of the head of a standard tree should be reduced after planting, but if it is decided to do so, do not prune the central leader if it is intended that the tree should grow to full stature, (see BSI 3936 Part 1 Appendix Table 4 for guidance).

7.0 AFTER-CARE

7.1 Firming after Frost or Wind

If the roots of newly planted plants are loosened, they shall be re-firmed as soon as practicable. This is readily achieved with the toe of the boot, to exclude air pockets from around the roots and particularly next to the base of the stem.

7.2 Weed Control

Weeds and grass compete for moisture and nutrients and shall be eliminated until the plants are well established, usually for at least 2 years. Cutting or mowing weeds does not prevent this competition. Pre-planting site preparation may give a weed-free start. A minimum of a one metre diameter weed-free area shall be maintained around each transplant, bv herbicide applications, mulches or hoeing throughout the whole of the first two years. Larger weed-free areas are appropriate for larger plants and should at least cover the surface of the original planting pit.
Mechanical strimmers and mowers must not be used near the stems of the plants as they can seriously damage the bark.

7.3 Conserving Moisture

Mulching may be used to conserve soil moisture. Mulches achieve this by helping to control weeds which rapidly transpire moisture, and by reducing evaporation from the soil. Mulches may consist of either sheet materials such as ultra-violet stabilised polythene, roofing felt; or granular materials like pea gravel, ground bark or wood chippings. Mulches shall only be applied when the soil is moist. Regular hoeing in dry weather will produce a dust mulch.

7.4 Providing Moisture

Though local climate and soil type will vary the requirements, as a guide it is recommended that during the growing season, newly planted trees and shrubs shall be irrigated following any four week period without appreciable rainfall. This may not apply to forestry planting but is particularly important for amenity trees in harsh urban or exposed positions

For reasonable growth, irrigation shall be applied at fortnightly intervals to moisten the soil so that the full rooting depth of soil is saturated. The amount of water required will vary considerably according to the texture and structure of the soil but as a guide a heavy standard tree will require at least 20 litres and a small transplant approximately 10 litres for each watering. Soils with low water holding capacity will only need smaller amounts of water but with irrigation carried out more frequently.

Container grown stock using, soil-less compost may require more frequent watering in the early stages us once the compost dries out it can be very difficult to re-wet.

Water must always be applied so that the soil is moistened to the depth of the root zone. For large nursery stock this can be facilitated by installing lengths of perforated plastic drainage pipe, or similar devices, in the planting pit at the time of planting.

Overwatenng is wasteful, both of water and other resources, and will only serve to leach nutrients away from the soil.

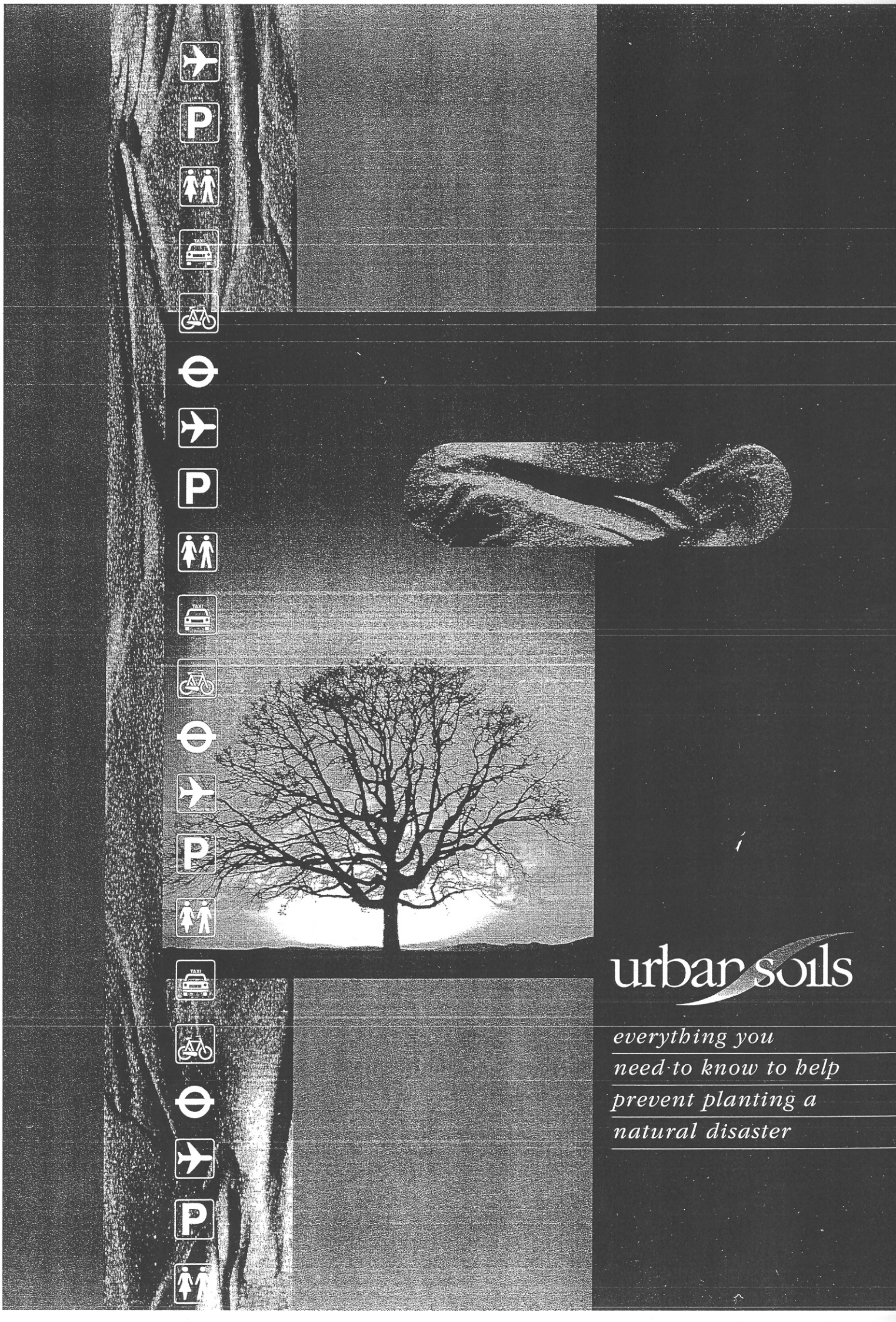
7.5 Protection

Plants may be damaged by voles, mice, hares, rabbits, deer, farm stock and vandals and suitable protection shall be considered at the planning stage. Regular inspections, say once a month, are essential so that appropriate action may be taken. Local circumstances will dictate whether it is best to fence a large area, use individual guards, or use poison for rodents. Maliciously damaged plants shall be replaced as soon as possible.

7.6 Stake Maintenance

Stakes and ties must be maintained to prevent damage to trees. Stakes shall be inspected regularly to ensure thev remain secure and ties shall be adjusted at least once a year to ensure they are not cutting into the stem. As soon as they are no longer necessary, stakes shall be removed to encourage the trees to develop naturally. This should normally be up to 3 years after planting.

Appendix 04: Urban Tree Soils



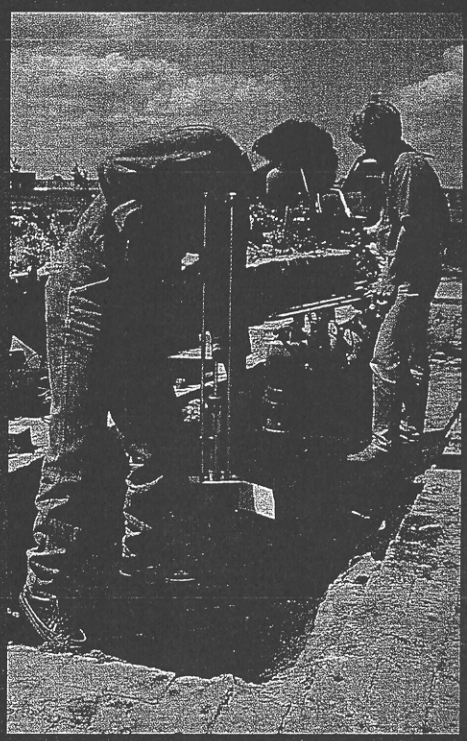
urban soils

everything you need to know to help prevent planting a natural disaster

Method

Typically for paved areas, such as town squares, road-side planting, superstores, municipal car parks etc..., a trench should be excavated approximately 1.00m deep, sufficiently wide and long to allow a minimum of 5 cubic metres per tree. If conditions will not allow this then individual pits should be 2.8m x 2.8m x 1m deep.
The trench, or tree pit should be backfilled in layers 300mm thick, each layer being compacted to 1.5-2.0 mega pascels and checked with a penetrograph.
The tree soil is topped with 150mm of compacted bedding sand with paving tiles, bricks or concrete blocks laid over the top of the trench. As the type of surface detail influences the amount of air exchange between the tree soil and the atmosphere it is recommend-ed to use a product that has a large amount of jointing such as brick pavers. This can be introduced into the pattern of surface detailing. For areas where there is extremely limited space a highly porous surface such as grasscrete or wide-nib pavers are needed.

A whacker is used to compact the tree soil



Compaction level is checked with a penetrograph

Brick pavers allow good air exchange

Grasscrete blockwork

urban soils

Urban Soils Limited
High Legh Estate Office
Knutsford
Cheshire WA16 0QS
Tel: 01925 757800
Fax: 01925 756599